CAB
ANNUAL REPORT
Memoria Anual 2023

CENTRO DE ASTROBIOLOGÍA · CAB
ASOCIADO AL NASA ASTROBIOLOGY PROGRAM

CSIC INTA

Contents Contenidos

Introduction

Introducción

El Centro de Astrobiología (CAB) se fundó en 1999 como un Centro Mixto entre el Consejo Superior de Investigaciones Científicas (CSIC) y el Instituto Nacional de Técnica Aeroespacial (INTA). Localizado en el campus del INTA en Torrejón de Ardoz (Madrid), en el año 2000 el CAB se convirtió en el primer centro no estadounidense asociado al recién creado NASA Astrobiology Institute (NAI), y actualmente es miembro asociado al Programa de Astrobiología de NASA (https://astrobiology.nasa.gov/). Por otro lado, en 2020 el CAB fue uno de los seis socios fundadores principales del recientemente creado Instituto Europeo de Astrobiología (EAI) (https://europeanastrobiology.eu/).

El objetivo de la Astrobiología es estudiar la vida como una consecuencia natural de la evolución del Universo, y el CAB tiene como objetivo contribuir a llenar los vacíos en la cadena de eventos desde el Big Bang hasta el origen y propagación de la vida, e iluminar a la sociedad sobre cuestiones fundamentales como de dónde venimos y hacia dónde vamos. Muchos procesos aún son desconocidos o poco comprendidos en esa sucesión de eventos y se requiere de un gran esfuerzo interdisciplinar para estudiar el único caso de vida que conocemos. En el CAB nos enfocamos en los que consideramos los procesos más críticos, de manera que nuestros objetivos científicos generales son:

• **Objetivo 1: Caracterizar los componentes básicos del Universo: Formación y evolución de galaxias a través del tiempo cósmico**. El objetivo es establecer las condiciones de contorno que llevaron al surgimiento de la vida en el contexto de la formación y evolución de galaxias y estrellas a lo largo del tiempo cósmico.

• **Objetivo 2: Comprender el ciclo de los elementos químicos: Del medio interestelar a las estrellas y planetas.** Con especial interés en la formación y evolución de moléculas complejas y la química prebiótica en el espacio interestelar y discos protoplanetarios.

• **Objetivo 3: Estudiar entornos planetarios potencialmente habitables.** Investigar la formación, evolución y habitabilidad del Sistema Solar y más allá.

• **Objetivo 4: Identificar y analizar biomarcadores para la búsqueda de vida en ambientes planetarios.** Búsqueda de rastros inequívocos de vida en entornos planetarios.

• **Objetivo 5: Comprender los principios básicos de la vida en ambientes planetarios, su evolución temprana y adaptabilidad a condiciones diversas y a menudo extremas**.

• **Objetivo 6: Desarrollar métodos e instrumentación avanzada para la exploración y caracterización in situ y remota de objetos cósmicos**.

El año 2023 ha sido especialmente relevante puesto que a últimos de junio se firmó la actualización del convenio de centro mixto entre INTA y CSIC que, entre otras novedades, simplifica la composición del “Consejo Rector”, pasando a denominarse “Comisión Rectora”, compuesto por dos representantes de cada una de las instituciones cotitulares. Asimismo, en septiembre procedimos a la elección de nuevo director y a la renovación de la Junta de Centro. Y también lamentamos la triste pérdida de dos compañeros que formaron parte de la comunidad LAEFF-CAB desde los comienzos del Centro: Carlos Rodrigo Blanco y David Hochberg.

El CAB ha continuado su actividad de gran calidad y altamente productiva, como refleja la autoría/coautoría de más de 380 artículos, la mayoría (>80%) en cuartil Q1 (fuente Scopus). La instrumentación desplegada en Marte (REMS y MEDA) sigue proporcionando datos y se han publicado nuevos resultados sobre la caracterización de la atmósfera marciana. Cumplido un año marciano (2 terrestres) científicos del CAB han liderado la publicación en la revista Nature Geoscience (portada del número) de los primeros resultados globales obtenidos con MEDA. El rover *Perseverance* sigue tomando muestras de testigos de rocas y sedimentos como primer paso para su transporte hacia la Tierra en la misión Mars Sample Return (MSR). Hemos liderado el descubrimiento de una colada de lava en Marte, de 59 millones de años de antigüedad, con un tubo de lava abierto a la superficie y varias estructuras subterráneas bien preservadas. Entre los días 20 y 24 de febrero el CAB organizó la reunión del grupo para la planificación científica de la “Misión de Muestreo y Retorno de Marte”, el MCSG (por sus siglas en inglés, *Mars sample return Campaign Science Group*), grupo de trabajo internacional encargado de planificar los procedimientos a seguir una vez las muestras lleguen a la Tierra. Hemos participado en la reconstrucción del impacto de la nave DART (NASA) sobre Dimorphos mediante experimentos y simulaciones realizados en la cámara *EPIC (Experimental Projectile Impact Chamber) del CAB.* Con el telescopio espacial James Webb (JWST) a pleno rendimiento, científicos del CAB participan y lideran investigaciones con colaboraciones internacionales que están proporcionando valiosos datos y descubrimientos como nuevas galaxias con formas y comportamientos anómalos, las galaxias más lejanas hasta ahora descubiertas, o la galaxia similar a la Vía Láctea más lejana jamás observada. De hecho, investigadores del CAB han obtenido un gran éxito para desarrollar proyectos en diversos campos de la astrofísica durante el segundo año de operaciones de JWST, posicionando al CAB dentro del selecto club de centros de investigación, a nivel mundial, que han conseguido Tiempo de Observación para desarrollar tres o más proyectos con JWST. Y miembros del CAB son partícipes del Premio al logro grupal 2024 por el instrumento MIRI del JWST.

Seguimos descubriendo nuevas moléculas en el espacio como el ácido carbónico, primera molécula interestelar con 3 átomos de oxígeno; y estudiando el origen de la complejidad molecular en el espacio haciendo uso de la teoría de redes complejas; o profundizando en los procesos mediante los cuales un sistema químico inestable puede romper la simetría especular izquierda-derecha debido a fluctuaciones térmicas. Hemos detectado péptidos análogos a otros de miles de millones de años en un entorno hidrotermal similar a la Tierra primitiva, y hemos comprobado cómo los microorganismos se atrincheran bajo biopelículas bacterianas que afectan a la virulencia y la resistencia a condiciones extremas.

Descubrimos una super-Tierra con una composición inesperada y que podría albergar una hidrosfera compuesta de agua en estado gaseoso y supercrítico. Hemos liderado investigaciones que han logrado medir el amoníaco en la atmósfera de una estrella enana marrón fría. Por otro lado, algunos de nuestras jóvenes promesas han visto reconocido su trabajo con los premios a la “Mejor Comunicación Póster” y “Mi tesis en 3 minutos” respectivamente en congresos. Finalmente, destacar que el CAB consiguió en 2023 dos proyectos del ERC (Consejo de Investigación Europeo): un Advanced Grant titulado “SUL4LIFE: The trail of sulphur: from molecular clouds to life”, IP Asunción Fuente, y un Consolidator Grant, “OPENS: The Onset of Prebiotic chEmistry iN Space", por Izaskun Jiménez Serra para buscar moléculas relevantes para el origen de la vida en el espacio.

The Astrobiology Center (CAB) was founded in 1999 as a Joint Center between the Higher Council for Scientific Research (CSIC) and the National Institute of Aerospace Technology (INTA). Located on the INTA campus in Torrejón de Ardoz (Madrid), in 2000 the CAB became the first non-US center associated with the recently created NASA Astrobiology Institute (NAI), and is currently an associate member of the NASA Astrobiology Program (https://astrobiology.nasa.gov/). On the other hand, in 2020 the CAB was one of the six main founding partners of the recently created European Astrobiology Institute (EAI) (https://europeanastrobiology.eu/).

The aim of Astrobiology is to study life as a natural consequence of the evolution of the Universe, and the CAB aims to contribute to filling the gaps in the chain of events from the Big Bang to the origin and propagation of life, and illuminate the society on fundamental questions such as where we come from and where we are going. Many processes are still unknown or poorly understood in this succession of events, and a great interdisciplinary effort is required to study the only case of life we know. At the CAB we focus on what we consider to be the most critical processes, so our general scientific objectives are:

- **Objective 1**: **To characterize the building blocks of the Universe: Formation and evolution of galaxies through cosmic time**. The aim is to draw up the boundary conditions that led to the emergence of life in the context of the formation and evolution of galaxies and stars through cosmic time.

- **Objective 2**: **To understand the cycle of chemical elements: From the interstellar medium to stars and planets**. With special interest in the formation and evolution of complex molecules and the prebiotic chemistry in the interstellar space and protoplanetary disks.

- **Objective 3**: **To study potentially habitable planetary environments**. To investigate the formation, evolution, and habitability of the Solar System and beyond.

- **Objective 4: To find and analyze biomarkers for the search for life in planetary environments.** Searching for unequivocal fingerprints of life in planetary environments.

- **Objective 5**: **To understand the basic principles of life in planetary environments, its early evolution and adaptability to diverse and often extreme conditions**.

- **Objective 6: To develop methods and advanced instrumentation for in situ and remote exploration and characterization of cosmic objects.**

The year 2023 has been especially relevant since at the end of June we signed the update of the joint center agreement between INTA and CSIC, which, among other novelties, simplifies the composition of the "Governing Council" and renamed it "Governing Commission", composed of two representatives of each of the co-owning institutions. Likewise, in September we proceeded to the election of a new director and the renewal of the Board of the Center. We also regret the sad loss of two colleagues who were part of the LAEFF-CAB community since the beginning of the Center: Carlos Rodrigo Blanco and David Hochberg.

The CAB has continued its high quality and highly productive activity, as reflected by the authorship/co-authorship of more than 380 papers, most of them (>80%) in Q1 quartile (Scopus source). The instrumentation deployed on Mars (REMS and MEDA) continues to provide data and new results on the characterization of the Martian atmosphere have been published. After one Martian year (2 Earth years), CAB scientists have led the publication in the journal Nature Geoscience (cover of the issue) of the first global results obtained with MEDA. The Perseverance rover continues to take rock and sediment core samples as a first step for transport to Earth on the Mars Sample Return (MSR) mission. We have led the discovery of a 59-million-year-old lava flow on Mars with a lava tube open to the surface and several well-preserved subsurface structures. On February 20-24, CAB organized the meeting of the Mars Sample Return Campaign Science Group (MCSG), an international working group in charge of planning the procedures to be followed once the samples reach Earth.

We have participated in the reconstruction of the impact of the DART spacecraft (NASA) on Dimorphos through experiments and simulations performed in the EPIC (Experimental Projectile Impact Chamber) of the CAB. With the James Webb Space Telescope (JWST) at full capacity, CAB scientists participate and lead research with international collaborations that are providing valuable data and discoveries such as new galaxies with anomalous shapes and behaviors, the most distant galaxies ever discovered, or the most distant Milky Way-like galaxy ever observed. In fact, CAB researchers have had great success in developing projects in various fields of astrophysics during the second year of JWST operations, placing the CAB among the select club of research centers worldwide that have obtained Observing Time to develop three or more projects with JWST. And CAB members are participants in the 2024 Group Achievement Award for the JWST MIRI instrument.

We keep discovering new molecules in space such as carbonic acid, the first interstellar molecule with 3 oxygen atoms; and to study the origin of molecular complexity in space using the theory of complex networks; or delving into the processes by which an unstable chemical system can break left-right specular symmetry due to thermal fluctuations. We have detected peptides analogous to others billions of years old in a hydrothermal environment similar to the early Earth, and we have tested how microorganisms become entrenched under bacterial biofilms affecting virulence and resistance to extreme conditions.

We discovered a super-Earth with an unexpected composition that could harbor a hydrosphere composed of gaseous and supercritical water. We have led research that has succeeded in measuring ammonia in the atmosphere of a cool brown dwarf star. On the other hand, some of our promising young scientists have had their work recognized with the awards for “Best Poster Communication” and “My thesis in 3 minutes” respectively in congresses. Finally, it should be noted that in 2023 the CAB won two ERC (European Research Council) projects: an Advanced Grant entitled “SUL4LIFE: The trail of sulphur: from molecular clouds to life”, PI Asunción Fuente, and a Consolidator Grant, “OPENS: The Onset of Prebiotic chEmistry iN Space”, by Izaskun Jiménez Serra to search for molecules relevant to the origin of life in space.

Center

organization

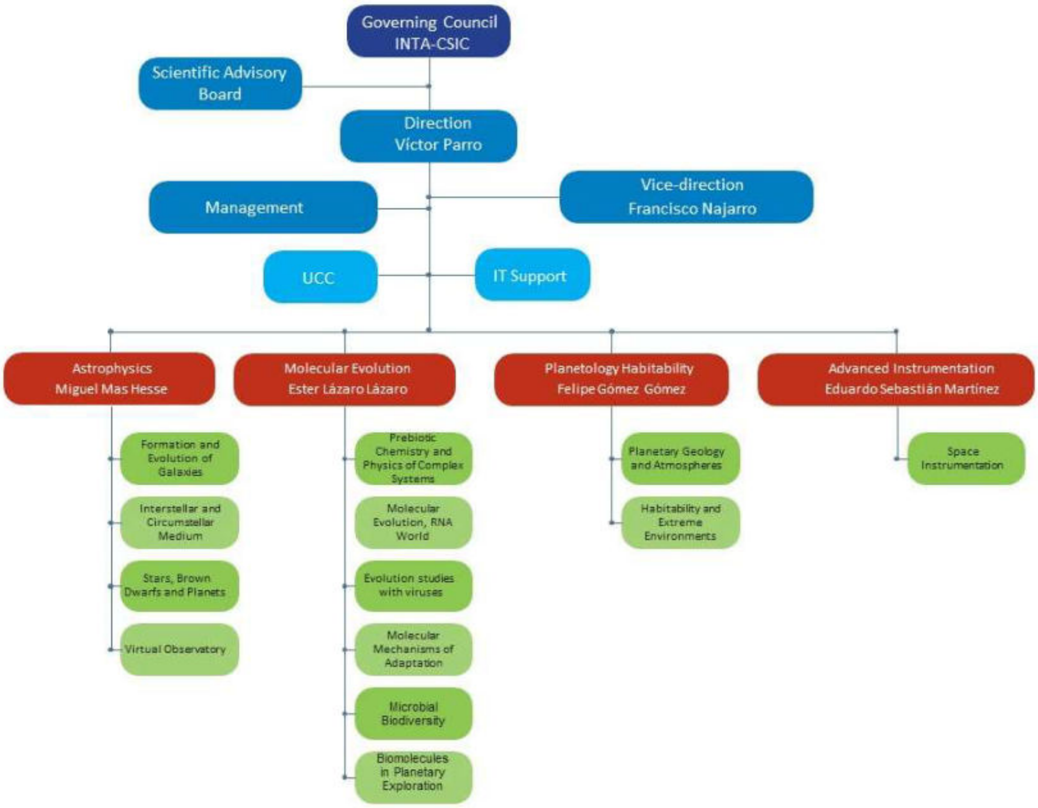


Figure: Centro de Astrobiología is a joint institute participated by Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC) and Instituto Nacional de Técnicas Aeroespaciales (INTA). Its Governing Council is therefore chaired by CSIC President and INTA Director General, to whom the CAB Director and Deputy Director report.

Organization of Centro de Astrobiología in 2023. CAB is organized in four Research Departments (red), each of them having different research groups (green). Additional units such as the *Unidad de Cultura Científica* (UCC), the Informatics Support, or the DNA Sequencing service, provide the required support for the operations of CAB. The departments operate a number of laboratories and facilities covering the very different areas of activities.

Members

of the Governing Council 2023

- **D. Antonio Javier Guerrero Mochón**, Subdirector General de Coordinación y Planes de INTA.
- **D. José Luis Murga Martínez**, Secretario General de INTA.
- **D. Carlos Closa Montero**, Vicepresidente de Organización y Relaciones Institucionales de CSIC
- **Dña. Marina Villegas**, Delegada Institucional de CSIC en la Comunidad de Madrid

Advisory

Board

The former Directors of CAB constitute its Advisory Board:

• Prof. **Juan Pérez Mercader** (CSIC): 1999-2008

• Prof. **Álvaro Giménez Cañete** (CSIC): 2008-2010

• Dr. **Javier Gómez Elvira** (INTA): 2010-2015

• Dr. **Miguel Mas Hesse** (CSIC): 2015-2019

External scientific

advisory board

- **Paola Caselli** (Director and Scientific Member at the Max Planck Institute for Extraterrestrial Physics, Garching, Germany)
- **Muriel Gargaud** (CNRS Research Director, Laboratoire d'Astrophysique de Bordeaux, Université de Bordeaux, France)
- **Rosaly Lopes** (Directorate Scientist, NASA's Jet Propulsion Laboratory (JPL), Pasadena, CA, USA)
- **Michel Mayor** (University of Geneva, Geneve. Nobel Prize in Physics 2019)
- **Christopher McKay** (Space Science Division - NASA Ames Research Center, USA)
- **Gian Gabriele Ori** (Universita d'Annunzio, Pescara, Italy - Ibn Battuta Centre, Marrakech)

Direction and Center

executive board

Victorino Parro García

Francisco Najarro de la Parra

Name	Position
Victorino Parro García	Director
Francisco Najarro de la Parra	Deputy Director
Miguel Mas Hesse	Head of Astrophysics
Olga Prieto Ballesteros/Felipe Gómez Gómez	Head of Planetology and Habitability
Ester Lázaro Lázaro	Head of Molecular Evolution
Eduardo Sebastián Martínez	Head of Advanced Instrumentation
José Antonio Caballero/Benjamín Montesinos Comino	Researcher
Bruno Rodríguez del Pino/Ángeles Aguilera Bazán	Researcher
Mª Paz Martín Redondo/Consuelo Moncayo Ortega	Technician

Management

and support

Margie Guitart Martín	Administration
Consuelo Moncayo Ortega	Administration
Virginia Suarez Marsá	Technical management

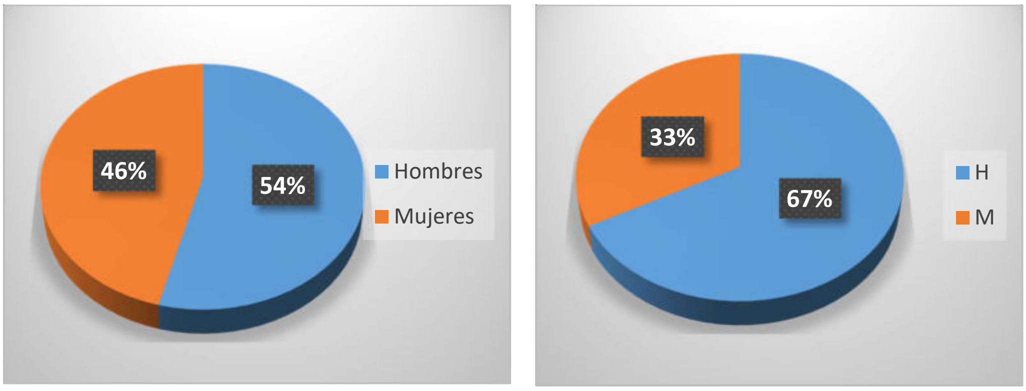
External Support

In 2023

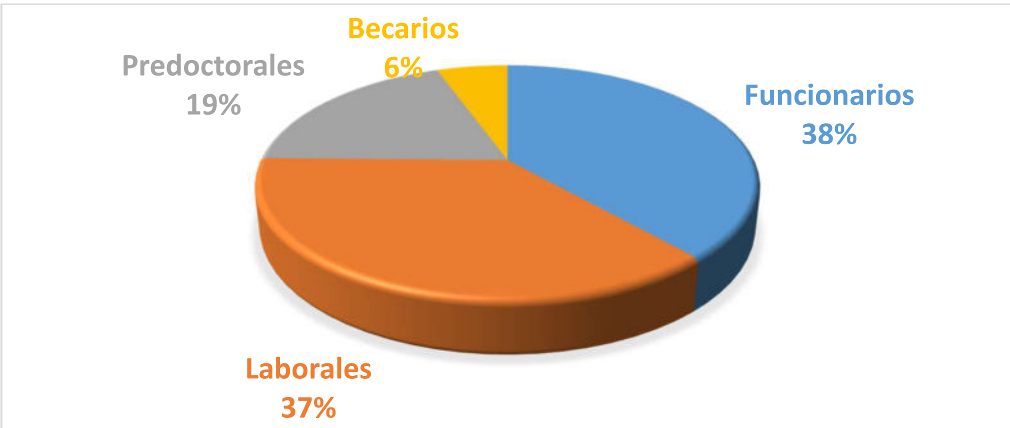
María Pilar Alonso del Val	Technical support
Rosa del Olmo Andrés	Technical management
Tatiana Fraile Noriega	Technical management
María Teresa García Martín	Technical management
Macarena Gutiérrez Ortega	Technical management
Antonio Parras Rico	Computing support
Sergio Suarez Carrasco	Computing support
Ignacio Barranquero	Scholarship student

Personnel

By Gender (December 2023)

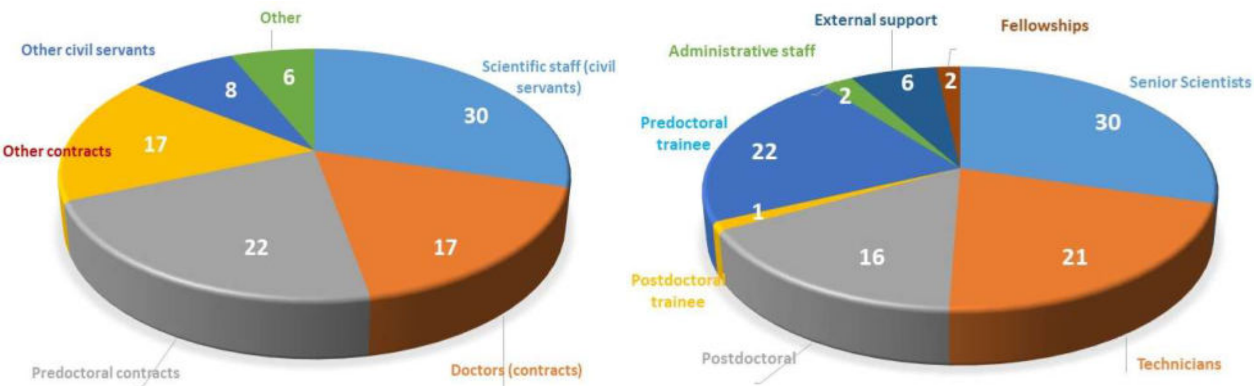


Gender Balance: Total(left); Scientific scales (right). Women (M); Men (H)



Personnel

by category

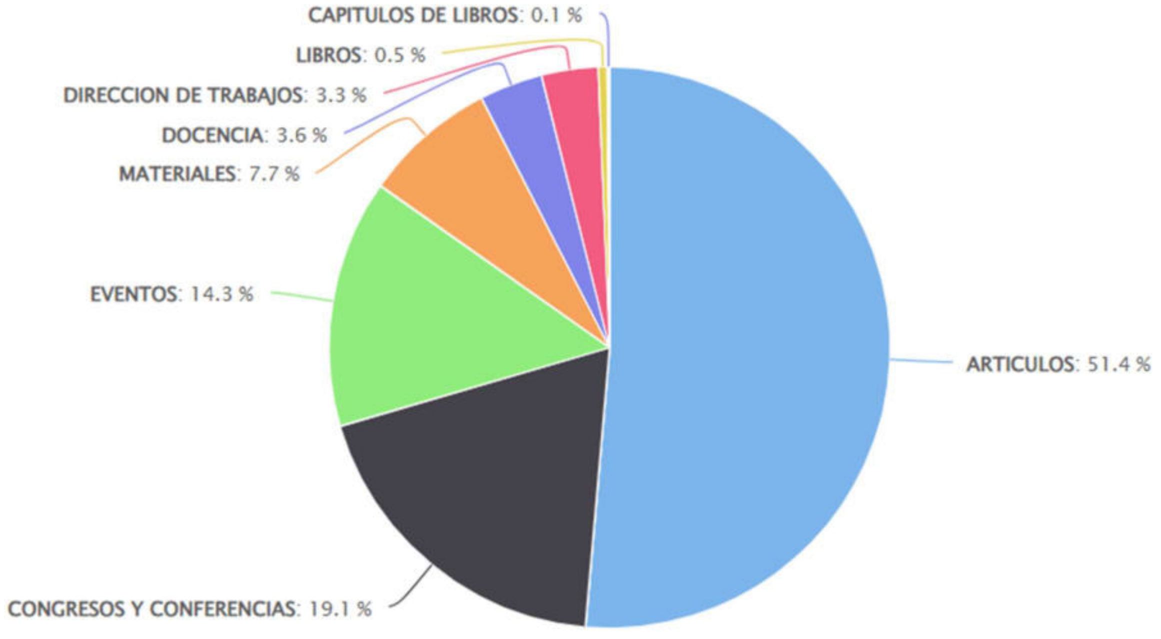


Personnel by type of contract (left) and by professional category (right)

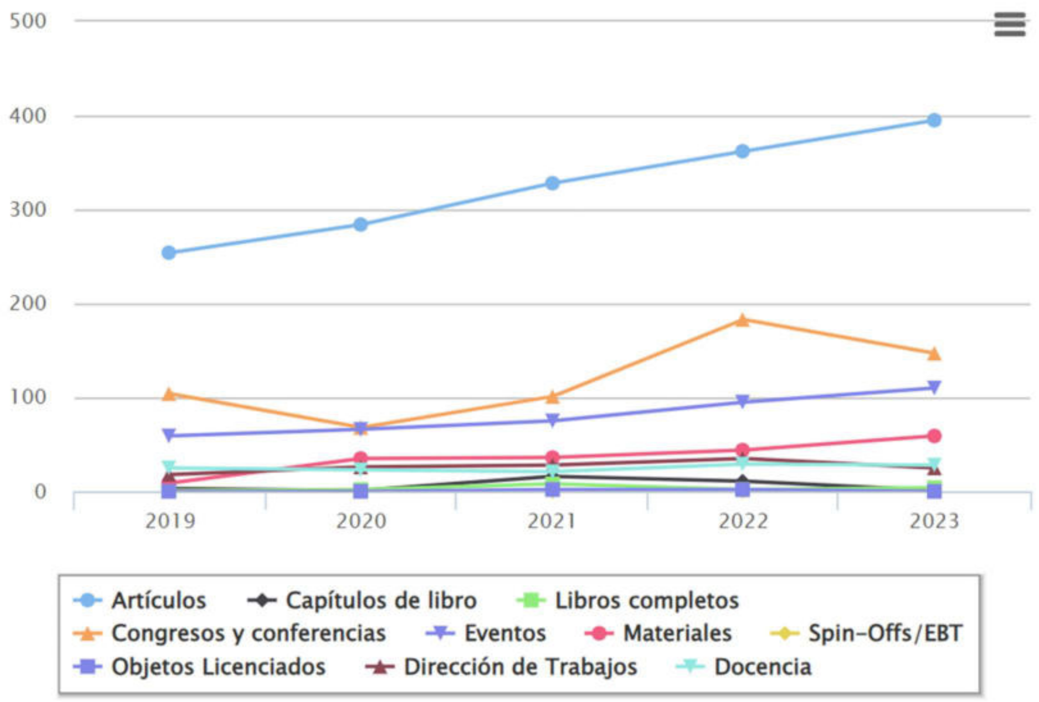
Scientific

Production

Different indicators of the scientific production in 2023 (internal sources: conCIENCIA)

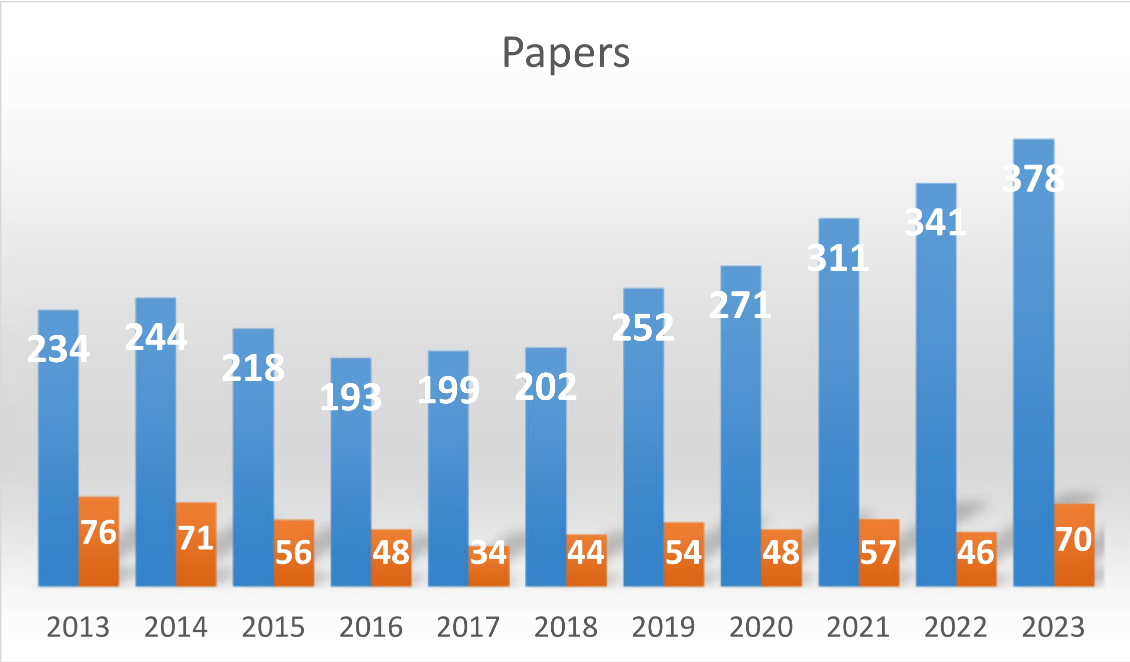


Evolution last five years

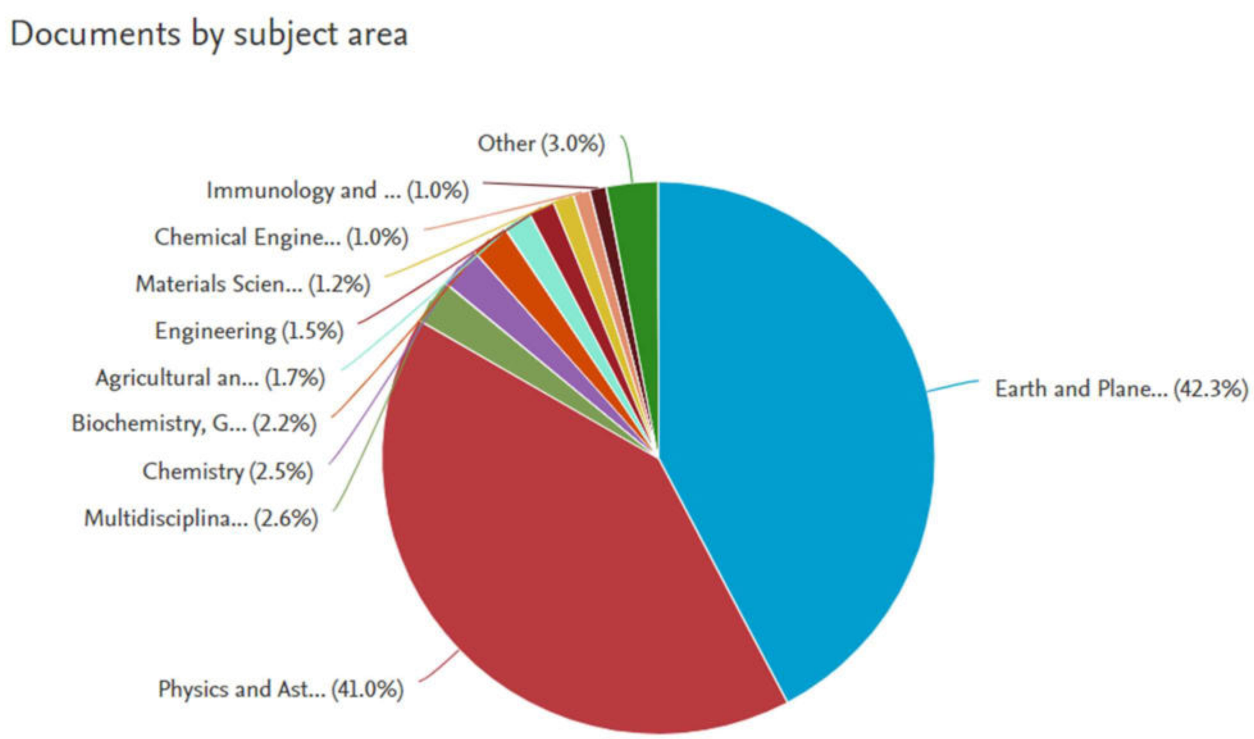


Research Articles

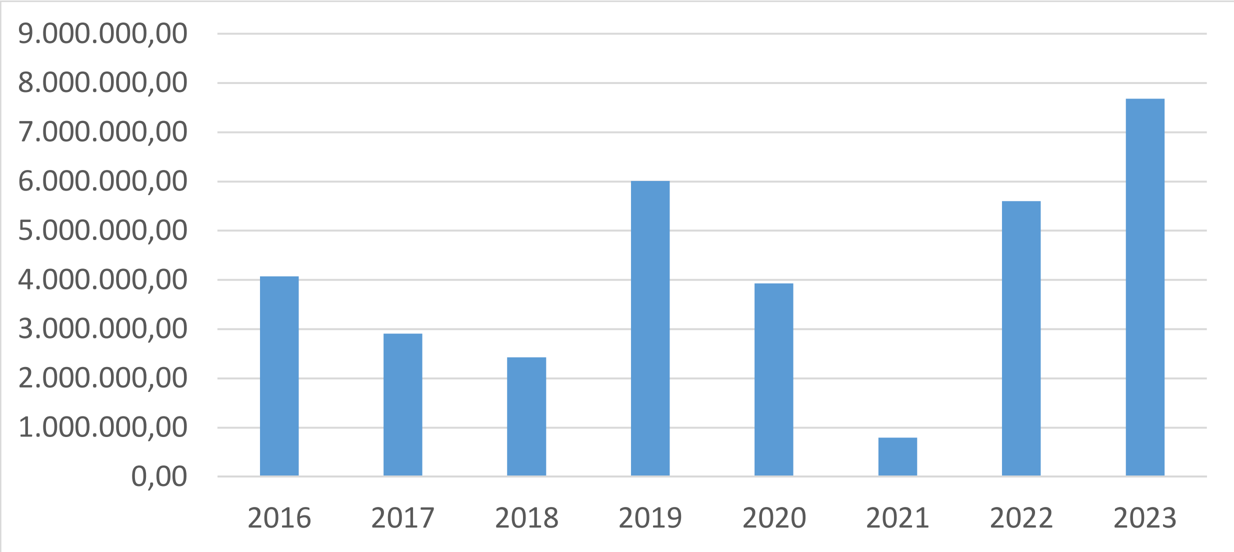
Evolution of the number of articles by year: total (blue) and led by CAB (red). Source: Scopus



Scientific production by subject area 2023 (source Scopus)



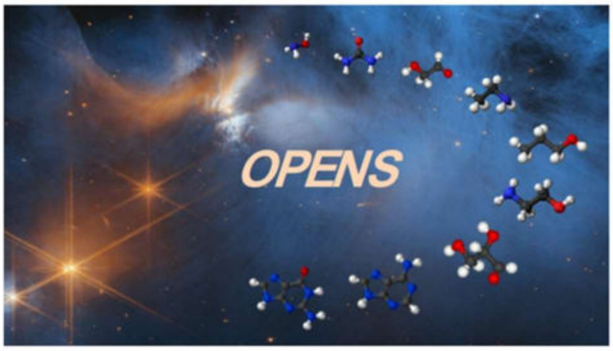
Obtained funds from competitive calls (€ per year)



European Research Council
Established by the European Commission

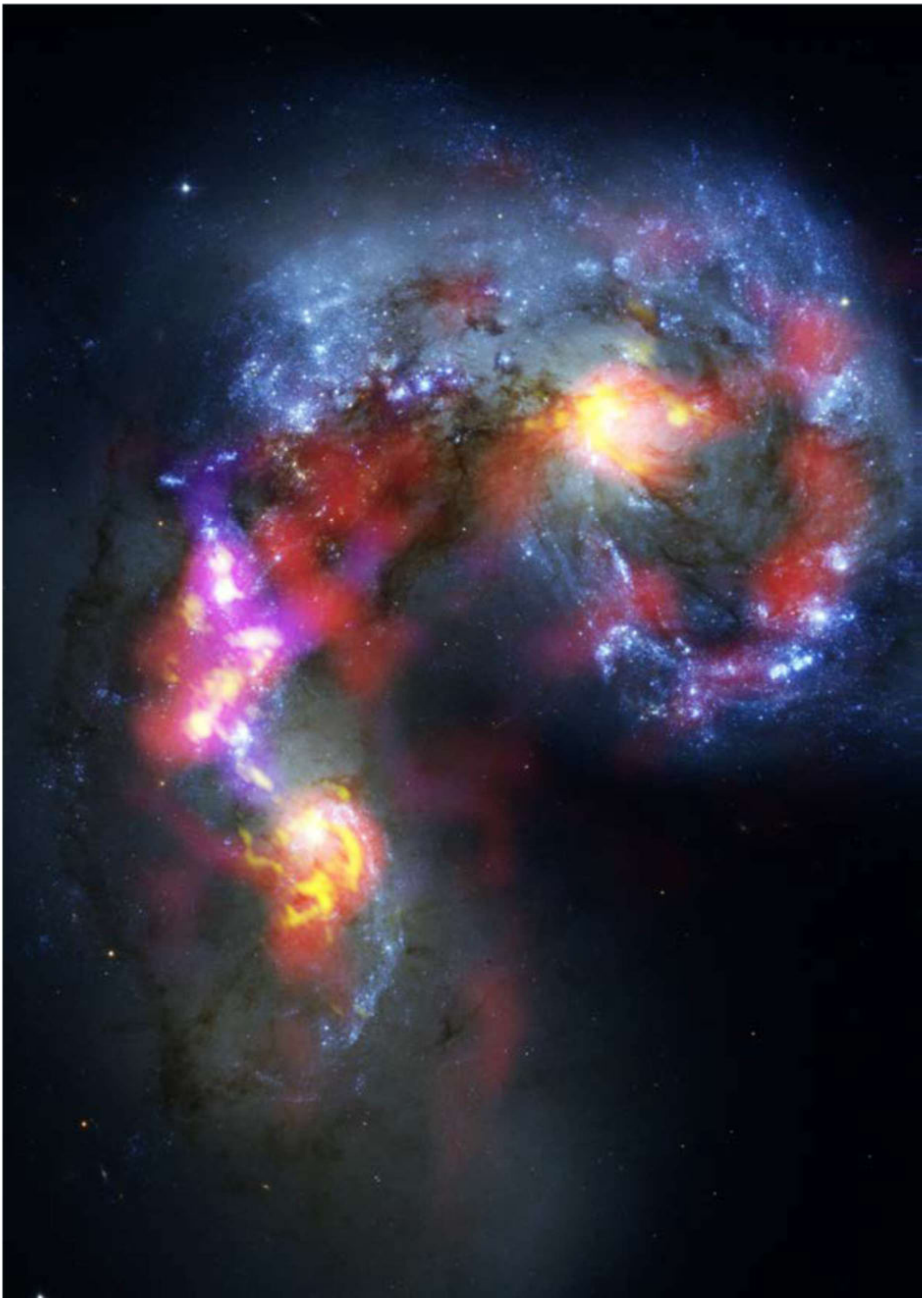
AdG
SUL4LIFE : The trail of sulphur: from molecular clouds to life
Asunción Fuente

CoG
OPENS: The Onset of Prebiotic chEmistry iN Space
Izaskun Jiménez Serra



Astrophysics

department of



Head of Department: J. Miguel Mas Hesse

The research at the Department of Astrophysics is focused on the formation and evolution of galaxies, stars and planets and their interplay with the interstellar medium, providing so the large-scale context in which Life emerged and evolved. The objectives are organized around the following questions:

To characterize the building blocks of the Universe: Formation and evolution of galaxies through cosmic time.

Our research is based on the general hypothesis that Life is a consequence of the evolution of matter and energy in the Universe, aiming to link the studies on the origin and evolution of the Universe with the emergence and potential spread of life.

To understand the cycle of chemical elements: From the interstellar medium to stars and planets.

The focus will be on the details of the cycle of chemical elements, from their production by stellar evolution to the formation of complex molecules and dust, the formation of stars, brown dwarfs and planets, and the development of prebiotic chemistry in the interstellar space and protoplanetary disks. All this provides the boundary conditions to study the emergence of life in the solar System (at least) around 4 billion years ago.

To study potentially habitable environments.

We aim to connect the efforts from the point of view of Astronomy to discover (exo)planetary systems, and analyze their components -planets, and minor bodies-architecture and evolution, with those from the side of Biology and Planetary Science to assess their potential habitability.

To develop methods and advanced instrumentation for the characterization of cosmic objects.

Including the development ground- and space-based instrumentation for observing objects within and beyond the Solar System

The Department of Astrophysics is constituted by 4 research groups:

• Formation and Evolution of Galaxies (FEG)

• Formation and Evolution of Stars, Brown Dwarfs and Planets (FESBDP)

• Interstellar and Circumstellar Medium (ICM)

• Virtual Observatory: Scientific exploitation of astronomical archives (VO)

Formation and Evolution of Galaxies (FEG)

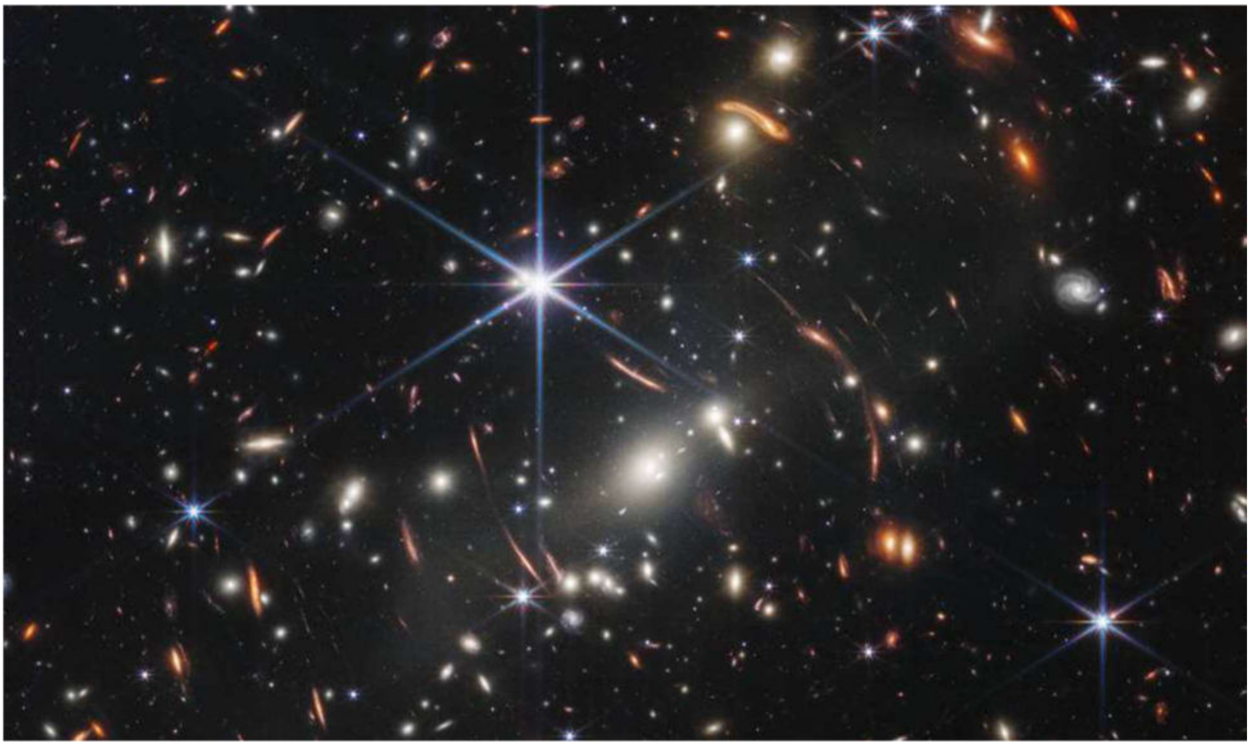


Figure: Portion of the James Webb Space Telescope's (JWST) first Deep Field image, centered on the galaxy cluster SMACS 0723, that is teeming with thousands of galaxies – including the faintest objects ever observed in the infrared. The combined mass of this galaxy cluster acts as a gravitational lens magnifying more distant galaxies and distorting their shape. This deep field, taken by Webb's Near-Infrared Camera (NIRCam), is a composite made from images at different wavelengths, totaling 12.5 hours of exposure [credit: NASA, ESA, CSA, and STScI]. The group is deeply involved in the current exploitation of Webb's data.

Group coordinator: Giovanni Miniutti

Senior Researchers:

Almudena Alonso Herrero

Santiago Arribas Mocoroa

Miguel Antonio Cerviño Saavedra

Luis Colina Robledo

José Miguel Mas Hesse

Giovanni Miniutti

Pablo Guillermo Pérez González

Javier Piqueras Lopez

Montserrat Villar Martín

Javier Álvarez Márquez

Fellows:

Marianna Annunziatella

Luca Costantin

Margherita Giustini

Michele Perna

Irene Shivaei

Postdocs:

Alejandro Crespo Gómez

Laura Hermosa Muñoz

Isabella Lamperti

Ana María Pérez García

Bruno Rodriguez Del Pino

PhD students:

Gonzalo José Carracedo Carballal

Rosa María Mérida González

Carlota Prieto Jiménez

Carmen Blanco Prieto

Students (TFM, TFG, others):

Pedro Hernández Cascales

Javier Mendez Gallego

Leonor Arriscado Nunes Ferreira Cardoso

Carmen Castillo De La Cruz

Technicians:

Heribert Argelaguet Vilaseca

Alberto Estrada Piqueras

Alonso Álvarez Urueña

Irene Ferro Rodríguez

Banghuan Xu

Javier Mendez Gallego

Visitors (more than one month)

Federico Esposito (University of Bologna)

Fergus Donnan (University of Oxford)

Lorenzo Ulivi (University of Trento)

Alina Ikhsanova (University of Padova)

Summary

The Galaxies Formation and Evolution group (FEG) contributes to objectives O1, O2 and O6 of CAB's Strategic Plan. Our broad scientific objective is to provide a global view of the physical processes involved in the formation and evolution of galaxies in the cosmological context across cosmic time. This goal is pursued through the analysis of astronomical data at all wavelengths of the electromagnetic spectrum, from radio, millimetric, and infrared to optical, ultraviolet and X-rays. We make use of data obtained, most often via competitive calls, from state-of-the-art ground- and space-based facilities and observatories. Our research interests cover a very wide range of topics from the search and characterization of galaxies and supermassive black holes from the early ages of the Universe to the present time, to the study of interacting and merging systems, of winds and outflows at all spatial scales, and of the nuclear activity associated with the central supermassive black hole and its interaction with the surrounding media. The group is heavily involved in technological projects for astronomical instrumentation both in space and on the ground in the framework of ESA's and ESO's programs. Group members participate in the instrument teams of the MIRI and NIRSpec instruments for the James Webb Space Telescope (JWST), they take part in the team responsible for the development of HARMONI, a first light instrument for the European Extremely Large Telescope (EELT), and they participate to the definition of the next ESA large X-ray observatory Athena, among other international projects. During 2023, the group led or co-authored more than 100 refereed scientific papers of which 7 have been published in the journal Nature and 1 in Science. Most of our work is carried out within international collaborations with colleagues and Institutions from all over the world. The following research highlights exemplify some of the most relevant scientific work and results whose publication was led by the group during the course of 2023.

RH1: X-ray quasi-periodic eruptions: properties and possible interpretation

As a follow up of our discovery of a new, extreme X-ray variability phenomenon from supermassive black holes (Miniutti et al. 2019), dubbed as "X-ray Quasi-Periodic Eruptions" (QPEs), we present a detailed analysis of the properties of QPEs from the galaxy GSN 069 [Miniutti et al 2023a, 2023b]. Our work is quickly becoming the benchmark against which theoretical models for the physical origin of QPEs are currently being tested. Among other properties, we report alternating QPE intensity and recurrence times, as well as the presence of a quasi-periodic oscillation of the underlying quiescent level with period similar to the mean separation between QPEs. We also show that QPEs are only present below a given luminosity threshold which puts severe constraints on theoretical models. By considering the long-term evolution of the source, we show that the quiescent emission in GSN 069 is, at least thus far, consistent with being powered by the repeating tidal stripping of the outer layers of a star (likely an evolved one) at each pericenter passage, occurring roughly every 9 years.

In Franchini et al. (2023), we present a theoretical model in which QPEs are produced by collisions between an orbiting lower mass black hole and the accretion disc around the primary supermassive one. This class of models appears to be able to explain also other QPE sources that have been discovered, and would imply the presence of extreme mass-ratio black hole binaries that represent one of the most promising sources of gravitational waves for the future generation of space-based detectors (LISA).

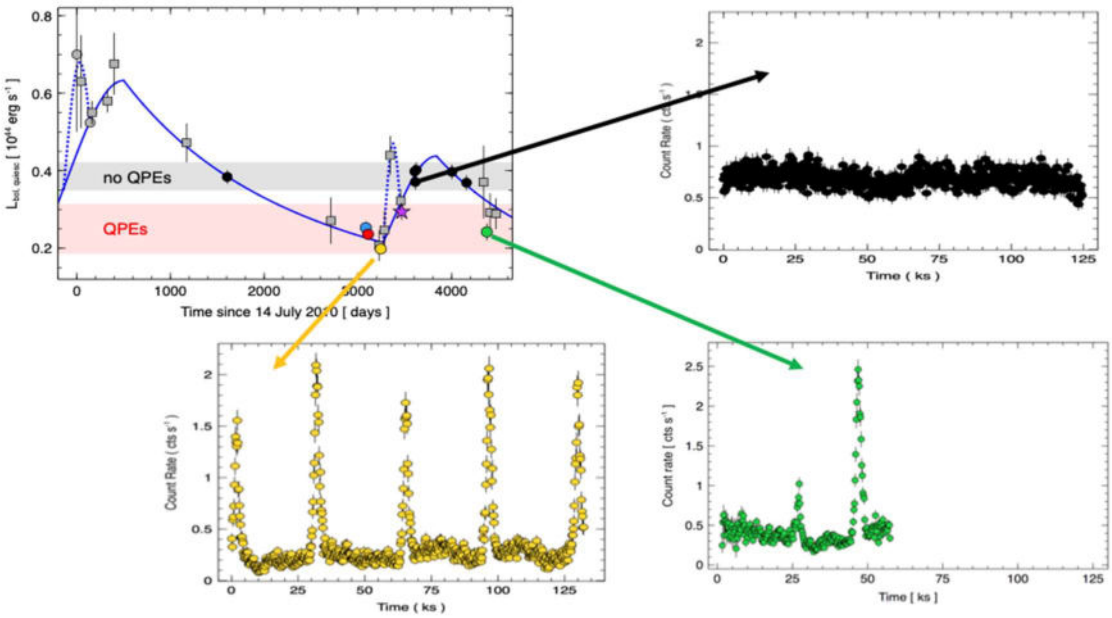


Figure RH1: Long-term (12 years) X-ray light curve of GSN 069 where the colored data points refer to observations during which QPEs have been detected. A few examples of X-ray light curves during individual observations are also shown to highlight their disappearance above a given luminosity threshold.

RH2: AGN feedback in action in the molecular gas ring of the Seyfert galaxy NGC 7172

We analyzed new ALMA observations of the CO(3−2) transition and associated 854 μm continuum at 0.06 – 0.3″ resolution, together with new VLT/SINFONI observations of NGC 7172. This is a luminous (bolometric luminosity of $\simeq 10^{44}$ erg s^{-1}) Seyfert galaxy that belongs to the Galaxy Activity, Torus, and Outflow Survey (GATOS, García-Burillo et al. 2021, Alonso-Herrero et al. 2021).

The ALMA CO(3−2) observations revealed the presence of a highly inclined cold molecular gas ring with an approximate radius of 3 – 4″ ≃ 540 – 720 pc, which is likely associated with an inner Lindblad resonance of a putative stellar bar. There are non-circular motions in the VLT/SINFONI [Si VI]λ1.96 μm and H2 at 2.12 μm, and ALMA CO(3−2) velocity fields. After subtracting the stellar velocity field, we detected [Si VI] blueshifted velocities of a few hundred km s^{-1} to the south of the active galactic nucleus (AGN) position. They trace outflowing ionized gas outside the plane of the galaxy and out to projected distances of ≃200 pc. The CO(3−2) position-velocity diagram along the kinematic minor axis displays non-circular motions with observed velocities of up to ∼150 km s^{-1}. Assuming that these are taking place in the disk of the galaxy, the observed velocity signs imply that the molecular gas ring is not only rotating but also outflowing. We derived an integrated cold molecular gas mass outflow rate of ∼40 $M_\odot$ yr^{-1} for the ring. Using the ALMA 854 μm extended emission map, we resolved a 32 pc radius torus with a gas mass of 8×10^5 $M_\odot$.

These torus properties are similar to other Seyfert galaxies in the GATOS sample (García-Burillo et al. 2021). We measured a decreased cold molecular gas concentration in the nuclear-torus region relative to the circumnuclear region when compared to other less luminous Seyfert galaxies.

We concluded that the effects of AGN feedback in NGC 7172, which are likely caused by the AGN wind and/or the moderate luminosity radio jet, are seen as a large-scale outflowing molecular gas ring and accompanying redistribution of molecular gas in the nuclear regions.

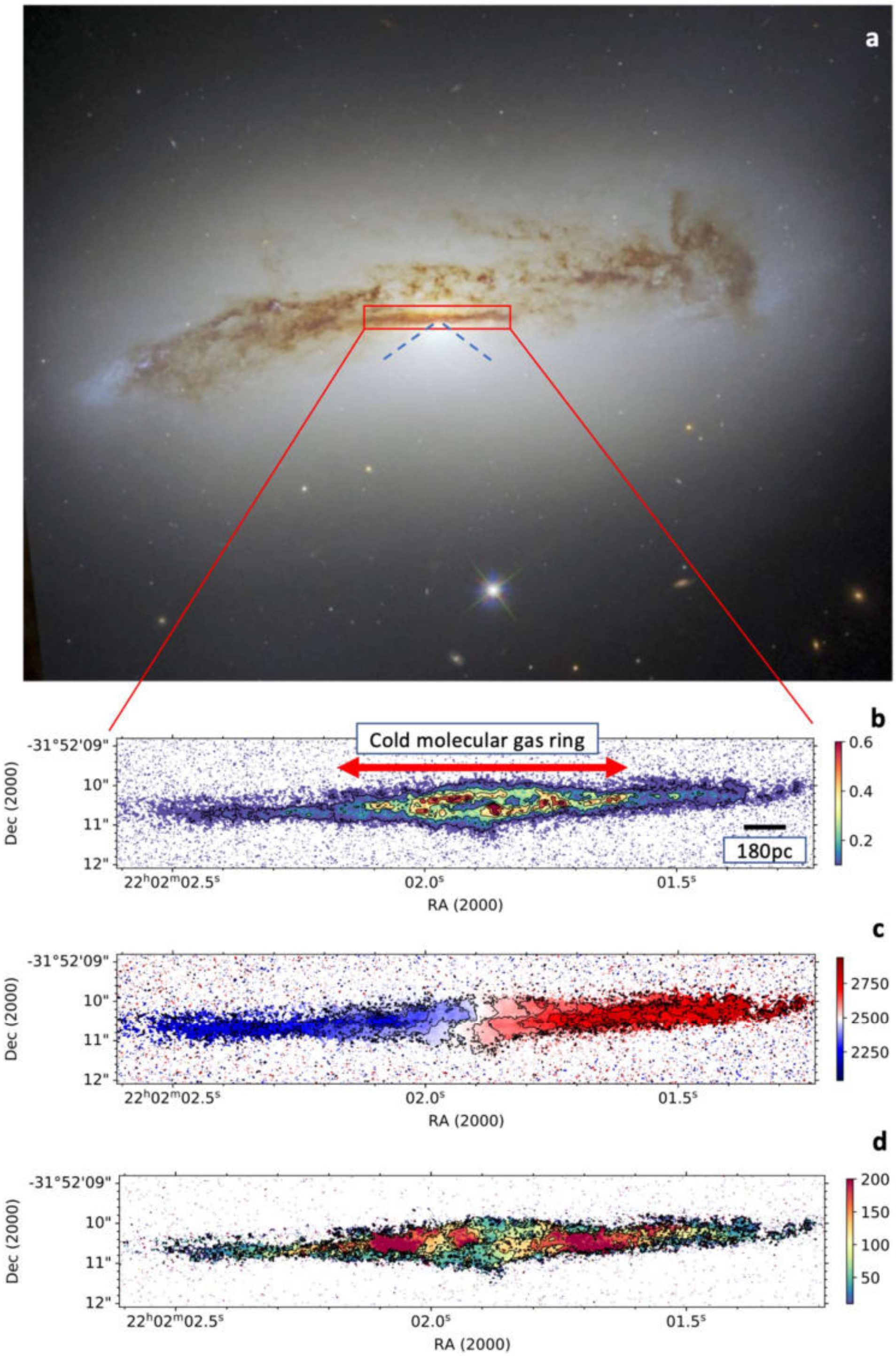


Figure RH2: The Seyfert galaxy NGC 7172. Panel a: HST optical to near-IR composite RGB image of NGC 7172 retrieved from ESASky4.3.0. The orientation of the image is north up, east to the left. The FoV is ≃2′ × 2′. The rectangle shows approximately the ALMA field of view (FoV), while the dashed lines represent the opening angle of the southern (brighter) side of the optical ionization cone. Image credit: ESA/Hubble & NASA, D. J. Rosario, A. Barth. Panels b, c, and d: ALMA CO(3−2) intensity map (moment 0), velocity map (moment 1), and velocity dispersion map (moment 2) with a FoV to approximately 17.6″ × 3.3″.

RH3: Uncovering the stellar structure of the dusty star-forming galaxy GN20 at z = 4.055 with MIRI/JWST

Luminous infrared galaxies at high redshifts (z > 4) include extreme starbursts that build their stellar mass over short periods of time, that is, of 100 Myr or less. These galaxies are considered to be the progenitors of massive quiescent galaxies at intermediate redshifts (z ∼ 2) but their stellar structure and buildup is unknown. Here, we present the first spatially resolved near-infrared (rest-frame 1.1 µm) imaging of GN20, one of the most luminous dusty star-forming galaxies known to date, observed at an epoch when the Universe was only 1.5 Gyr old.

The 5.6 µm image taken with the JWST Mid-Infrared Instrument (MIRI/JWST) shows that GN20 is a very luminous galaxy), with a stellar structure composed of a conspicuous central source and an extended envelope. The nucleus is co-aligned with the peak of the cold dust emission, and offset by 3.9 kpc from the ultraviolet stellar emission. The diffuse stellar envelope is similar in size to the clumpy CO molecular gas distribution. The centroid of the stellar envelope is offset by 1 kpc from the unresolved nucleus, suggesting GN20 is involved in an interaction or merger event suported by its location as the brightest galaxy in a proto-cluster.

The stellar size of GN20 is larger by a factor of about 3 to 5 than known spheroids, disks, and irregulars at z ∼ 4, while its size and low Sérsic index are similar to those measured in dusty, infrared luminous galaxies at redshift 2 of the same mass (∼1011 M⊙).

GN20 has all the ingredients necessary for evolving into a massive spheroidal quiescent galaxy at intermediate redshift: it is a large, luminous galaxy at z = 4.05 involved in a short and massive starburst centred in the stellar nucleus and extended over the entire galaxy, out to radii of 4 kpc, and likely induced by the interaction or merger with a member of the proto-cluster.

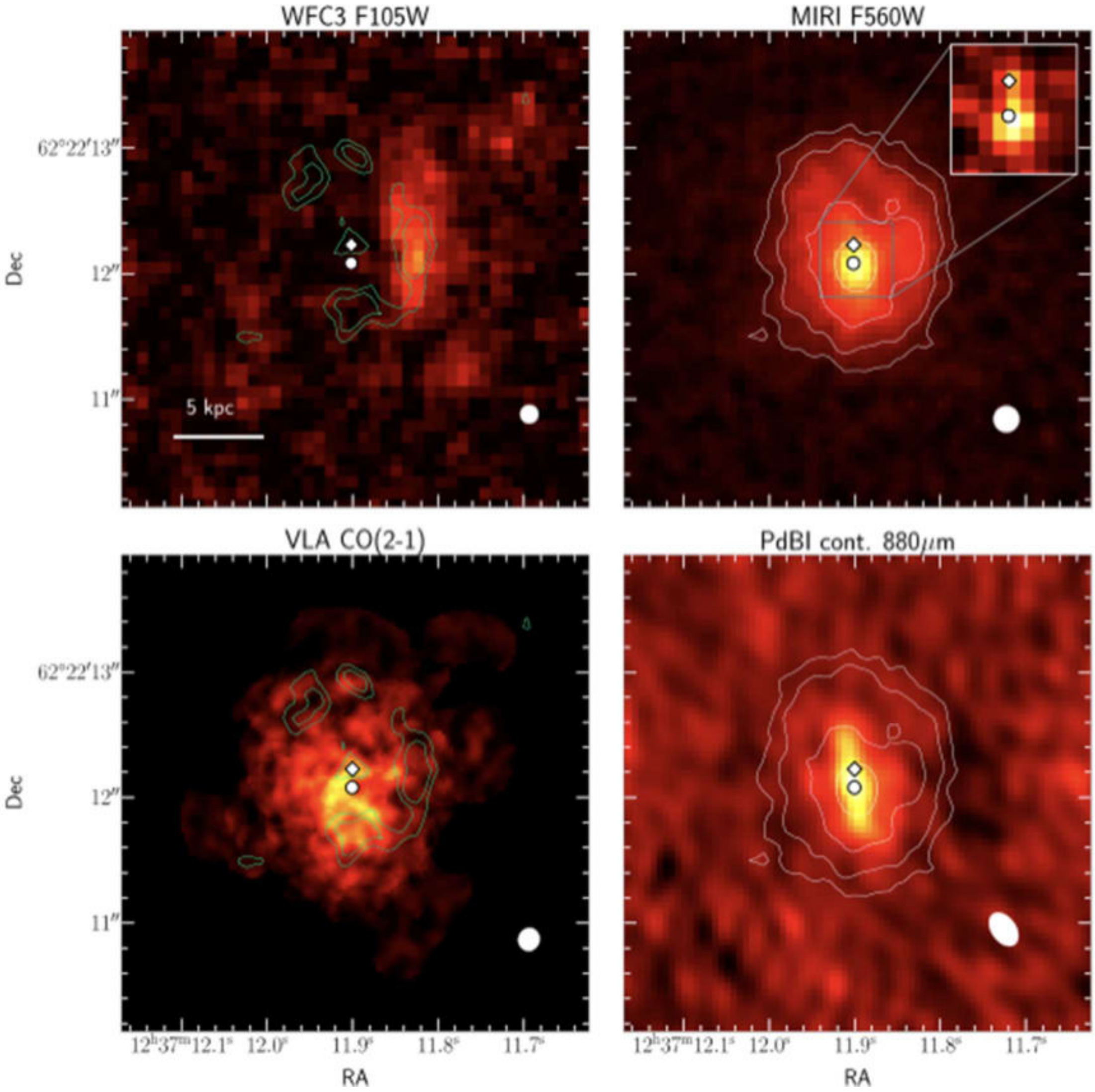


Figure RH3: Multi-wavelength morphology of GN20. Top panels display the WFC3/HST F105W (left) and MIRI/JWST F560W (right) images of GN20, tracing the rest-frame UV (0.2 μm) and near-IR (1.1 μm) light, respectively. Bottom left panel shows the CO(2-1) flux map, obtained with the VLA. Bottom right panel displays the rest-frame 170 μm continuum map from PdBI observations. Black-edged white diamond and circle mark the position of the centre for the nuclear point-source and extended components derived from the 2D brightness decomposition. White circles and ellipses at the bottom right corner of the panels represent the PSF or beam size for the different images. White contours on the right panels represent the F560W isophotes. Green contours in the left panels mark the residuals of the near-IR light distribution fit. The inset in the F560W image represents the central 0.6″ × 0.6″ region with the presence of a secondary nucleus.

RH4: Limited impact of jet-induced feedback in the multi-phase nuclear interstellar medium of 4C12.50

The ultraluminous infrared radio galaxy 4C12.50 at z=0.122 is an interesting target to investigate whether and how radio-induced feedback affects the evolution of galaxies in the early phases of radio activity. If this is the case, 4C12.50 is a promising candidate to reveal the phenomenon in action. In this paper we study, in detail for the first time, its reservoir of hot (≥1500 K) molecular gas. The potential impact of the radio jet on this gas phase, as well as on the star formation activity are investigated based on near-infrared long slit spectroscopy obtained with EMIR on GTC, X-shooter on VLT and high spatial resolution ALMA CO(2-1) data.

It is found that shocks (probably induced by the radio jet) contribute to the heating and excitation of the hot molecular gas. On the other hand, we find no solid evidence for a current or past impact of AGN induced feedback on the evolution of this system, neither by clearing out the dusty central cocoon efficiently, nor by suppressing the star formation activity. Although, clearly, absence of evidence is not evidence of absence, this work contributes to the open debate about the true role of AGN feedback in regulating the evolution of massive galaxies.

RH5: A Milky Way-like barred spiral galaxy at a redshift of 3

The majority of massive disk galaxies in the local Universe show a stellar barred structure in their central regions, including our Milky Way. Bars are supposed to develop in dynamically cold stellar disks at low redshift, as the strong gas turbulence typical of disk galaxies at high redshift suppresses or delays bar formation. Moreover, simulations predict bars to be almost absent beyond $z = 1.5$ in the progenitors of Milky Way-like galaxies. Here we report observations of ceers-2112, a barred spiral galaxy at redshift $z_{phot} \approx 3$, which was already mature when the Universe was only 2 Gyr old. The stellar mass ($M_\star = 3.9 \times 10^9\ M_\odot$) and barred morphology mean that ceers-2112 can be considered a progenitor of the Milky Way, in terms of both structure and mass-assembly history in the first 2 Gyr of the Universe, and was the closest in mass in the first 4 Gyr.

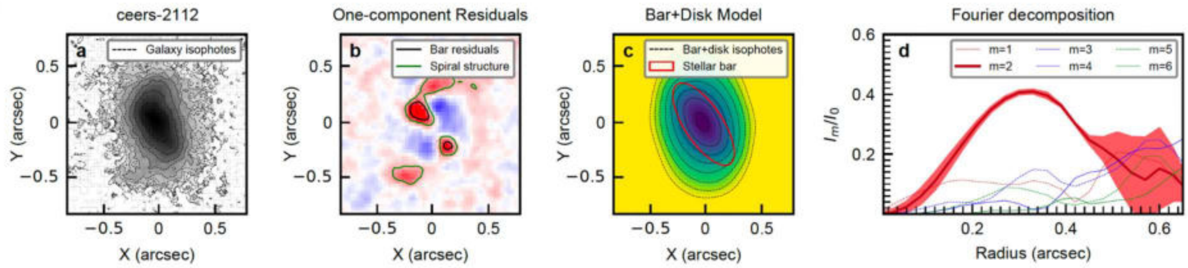


Figure RH5: **a**, Combined stack image of ceers-2112, with isophotal contours showing an elongated barred structure in the inner region and spiral arms departing from it. **b**, One-component Sérsic residuals, which highlight the bar and spiral structures (black and green contours, respectively). **c**, Two-dimensional bar + disk model, which shows a stellar bar of length $r_{Ferrers} = 0.42 \pm 0.03$ arcsec (3.3 kpc). The bar component is shown as a red solid line and the bar + disk isophotes are shown as black dashed contours. **d**, Radial profiles of the relative amplitude of the odd (dashed lines) and even (solid lines) Fourier components, derived from the deprojected stack image of ceers-2112. The $m = 2$ mode shows a prominent bar (maximum $I_2/I_0 > 0.4$) with strength $S_{bar} = 0.23 \pm 0.01$. Shaded region represents the 1σ confidence interval for the $m = 2$ mode.

We infer that baryons in galaxies could have already dominated over dark matter at $z \approx 3$, that high-redshift bars could form in approximately 400 Myr and that dynamically cold stellar disks could have been in place by redshift $z = 4$–5 (more than 12 Gyrs ago).

RH6: MIRI/JWST observations reveal an extremely obscured starburst in the z = 6.9 system SPT0311-58

Luminous infrared starbursts in the early Universe are thought to be the progenitors of massive quiescent galaxies identified at redshifts 2-4. Using the Mid-IRfrared Instrument (MIRI) on board the James Webb Space Telescope (JWST), we present mid-infrared sub-arcsec imaging and spectroscopy of such a starburst: the slightly lensed hyper-luminous infrared system SPT0311-58 at z = 6.9.

The MIRI IMager (MIRIM) and Medium Resolution Spectrometer (MRS) observations target the stellar (rest-frame 1.26 µm emission) structure and ionised (Paα and Hα) medium on kpc scales in the system. The MIRI observations are compared with existing ALMA far-infrared continuum and [C II]158µm imaging at a similar angular resolution. Even though the ALMA observations imply very high star formation rates (SFRs) in the eastern (E) and western (W) galaxies of the system, the Hα line is, strikingly, not detected in our MRS observations. This fact, together with the detection of the ionised gas phase in Paα, implies very high internal nebular extinction with lower limits (A_V) of 4.2 (E) and 3.9 mag (W) as well as even larger values (5.6 (E) and 10.0 (W)) by spectral energy distribution (SED) fitting analysis. The extinction-corrected Paα lower limits of the SFRs are 383 and 230 $M_\odot\ yr^{-1}$ for the E and W galaxies, respectively. This represents 50% of the SFRs derived from the [C II]158 µm line and infrared light for the E galaxy and as low as 6% for the W galaxy.

The MIRIM observations reveal a clumpy stellar structure, with each clump having $3\text{-}5\times10^9\ M_\odot$ mass in stars, leading to a total stellar mass of 2.0 and $1.5\times10^{10}\ M_\odot$ for the E and W galaxies, respectively. The specific star formation (sSFR) in the stellar clumps ranges from 25 to 59 Gyr^{-1}, assuming a star formation with a 50-100 Myr constant rate. This sSFR is three to ten times larger than the values measured in galaxies of similar stellar mass at redshifts 6-8. Thus, SPT0311-58 clearly stands out as a starburst system when compared with typical massive star-forming galaxies at similar high redshifts. The overall gas mass fraction is $M_{gas}/M_* \sim 3$, similar to that of $z \sim 4.5\text{-}6$ star-forming galaxies, suggesting a flattening of the gas mass fraction in massive starbursts up to redshift 7.

The kinematics of the ionised gas in the E galaxy agrees with the known [C II] gas kinematics, indicating a physical association between the ionised gas and the cold ionised or neutral gas clumps. The situation in the W galaxy is more complex, as it appears to be a velocity offset by about +700 km s^{-1} in the Paα relative to the [C II] emitting gas. The nature of this offset and its reality are not fully established and require further investigation.

The observed properties of SPT0311-58, such as the clumpy distribution at sub(kpc) scales and the very high average extinction, are similar to those observed in low- and intermediate-z luminous (E galaxy) and ultra-luminous (W galaxy) infrared galaxies, even though SPT0311-58 is observed only ~800 Myr after the Big Bang. Such massive, heavily obscured clumpy starburst systems as SPT0311-58 likely represent the early phases in the formation of a massive high-redshift bulge, spheroids and/or luminous quasars. This study demonstrates that MIRI and JWST are, for the first time, able to explore the rest-frame near-infrared stellar and ionised gas structure of these galaxies, even during the Epoch of Reionization.

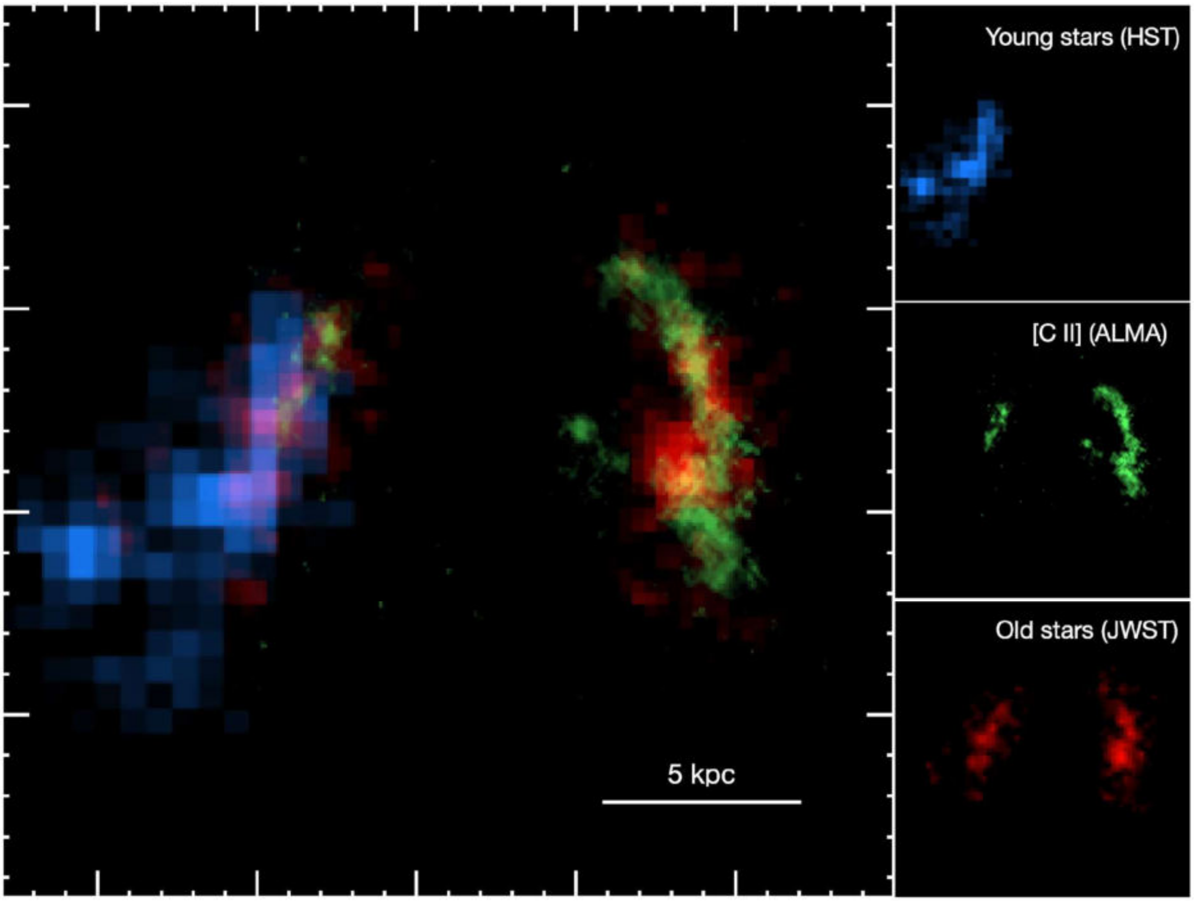


Figure RH6: : RGB image of SPT0311-58 where red, green, and blue colours show the ALMA [CII]158µm, MIRIM F1000W, and WPFC3 F160W lens-subtracted images representing the [CII], rest-frame 1.25 µm, and rest-frame 200nm continuum, respectively (see Sect. 2).

RH7: Nuclear high-ionisation outflow in the Compton-thick AGN NGC 6552 as seen by the JWST mid-infrared instrument

During the commissioning of the James Webb Space Telescope (JWST), the mid-infrared instrument (MIRI) observed NGC 6552 with the MIRI Imager and the Medium-Resolution Spectrograph (MRS). NGC 6552 is an active galactic nucleus (AGN) at a redshift of 0.0266 (D_L = 120 Mpc) classified as a Seyfert 2 nucleus in the optical and Compton-thick AGN in the X-ray.

This work exemplifies and demonstrates the MRS capabilities to study the mid-infrared (mid-IR) spectra and characterise the physical conditions and kinematics of the ionised and molecular gas in the nuclear regions of nearby galaxies.

MIRI Imager observations cover the full NGC 6552 galaxy at 5.6 µm. MRS observations cover its nuclear region (3.6×4.3 kpc at 17.7-27.9 µm) in a wavelength range between 4.9 and 27.9 µm. These observations were obtained with the aim to investigate the persistence of the MIRI detectors (residual signal left from previous bright source observations). However, NGC 6552 observations demonstrate the performance and power of the MIRI instrument even with a non-optimal observational strategy.

We obtained the nuclear, circumnuclear, and central mid-IR spectra of NGC 6552. They provide the first clear observational evidence for a nuclear outflow in NGC 6552. The outflow contributes to 67±7% of the total line flux independent of the ionisation potential (27-187 eV) and critical densities (10^4-4×10^6 cm^{-3}), showing an average blue-shifted peak velocity of −127±45 km s^{-1} and an outflow maximal velocity of 698±80 km s^{-1}. Since the mid-IR photons penetrate dusty regions as efficiently as X-ray keV photons, we interpret these results as the evidence for a highly ionised, non-stratified, AGN-powered, and fast outflowing gas in a low density environment (few 10^3 cm^{-3}) located very close (< 0.2 kpc) to the Compton-thick AGN. Nine pure rotational molecular Hydrogen lines are detected and spectrally resolved, and exhibit symmetric Gaussian profiles, consistent with the galactic rotation, and with no evidence of outflowing H_2 material. We detect a warm H_2 mass of $1.9 \pm 1.1 \times 10^7$ $M_\odot$ in the central region (1.8 kpc in diameter) of the galaxy, with almost 30% of that mass in the circumnuclear region. Line ratios confirm that NGC 6552 has a Seyfert nucleus with a black hole mass estimated in the range of 0.6-6 million solar masses.

This work demonstrates the power of the newly commissioned MIRI Medium Resolution Spectrograph to reveal new insights in the kinematics and ionisation state of the interstellar medium around the dusty nuclear regions of nearby active galaxies.

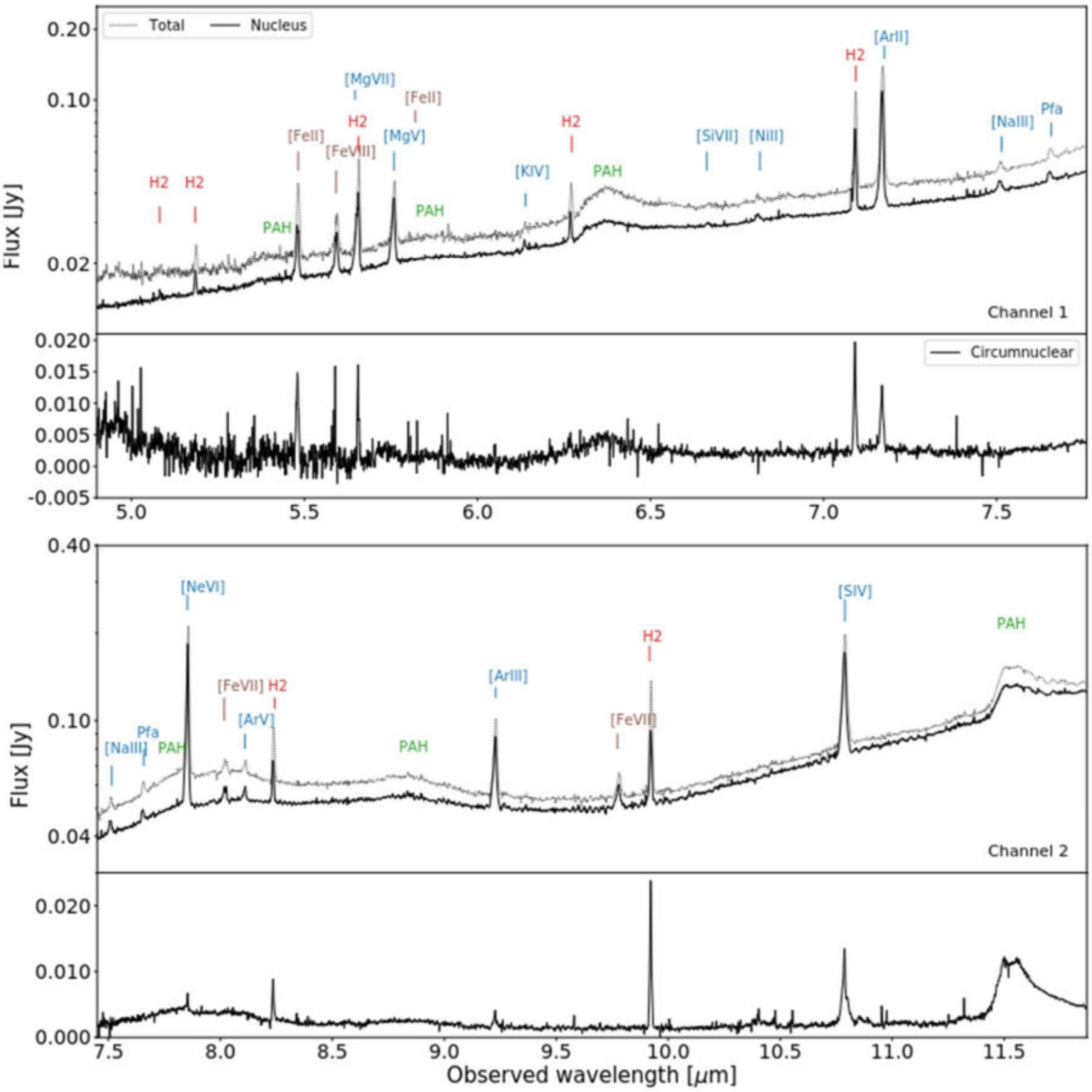


Figure RH7: Nuclear, circumnuclear, and central MRS spectra of NGC 6552 from MRS channels 1 and 2. Upper panel: Central and nucleus spectra. Bottom: Circumnuclear spectra. The main emission features are highlighted together with the PAHs.

RH8: Expectations of the Size Evolution of Massive Galaxies at 3 < z < 6 from the TNG50 Simulation: The CEERS/JWST View

We present a catalog of about 25,000 images of massive ($M_\star$ 10^9 $M_\odot$) galaxies at redshifts 3 < z < 6 from the TNG50 cosmological simulation, tailored for observations at multiple wavelengths carried out with JWST. The synthetic images were created with the SKIRT radiative transfer code, including the effects of dust attenuation and scattering. The noiseless images were processed with the mirage simulator to mimic the Near Infrared Camera (NIRCam) observational strategy (e.g., noise, dithering pattern, etc.) of the Cosmic Evolution Early Release Science (CEERS) survey. In this paper, we analyse the predictions of the TNG50 simulation for the size evolution of galaxies at 3 < z < 6 and the expectations for CEERS to probe that evolution. In particular, we investigate how sizes depend on the wavelength, redshift, mass, and angular resolution of the images. We find that the effective radius accurately describes the three-dimensional half-mass–radius of the TNG50 galaxies. Sizes observed at 2 µm are consistent with those measured at 3.56 µm at all redshifts and masses. At all masses, the population of higher-z galaxies is more compact than their lower-z counterparts. However, the intrinsic sizes are smaller than the mock observed sizes for the most massive galaxies, especially at z < 4. This discrepancy between the mass and light distributions may point to a transition in the galaxy morphology at z = 4–5, where massive compact systems start to develop more extended stellar structures.

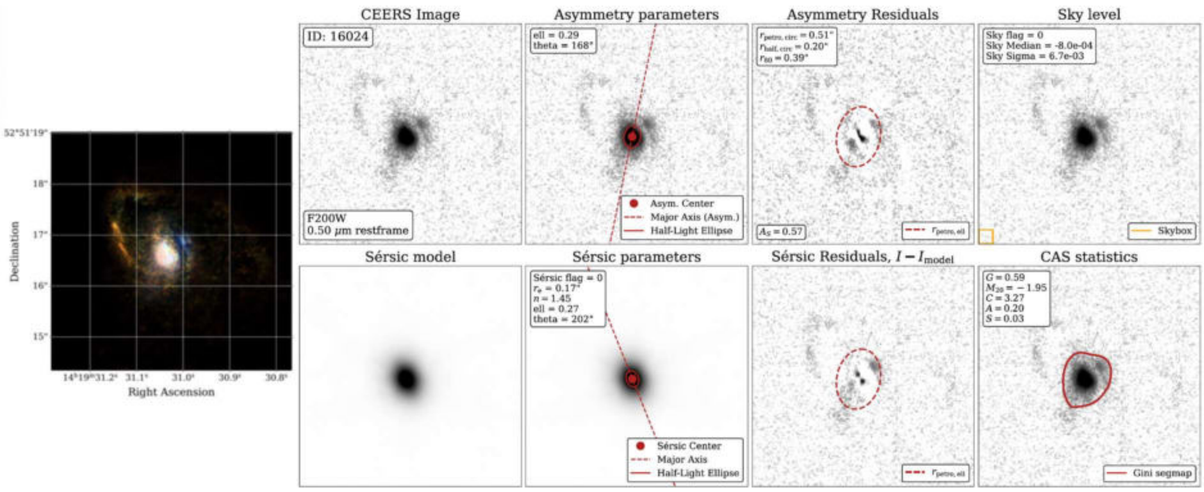


Figure RH8: Example of the morphological parameters derived with statmorph for galaxy ID 16024 (z = 3, $M_\star$ ~ 10^{11} $M_\odot$, i = 0, a = 0) in the F200W filter at 0.015 arcsec px^{-1}. On the left panel, we show an RGB synthetic image of the galaxy (0.01 arcsec px^{-1}), created using the F090W, F150W, and F200W noiseless data. Top row (from left to right): the CEERS image oriented with north up and east left, the asymmetry parameters (the galaxy center is shown as a red point, the half-light ellipse is shown as a solid red line, and the orientation of the major axis is shown as a dashed red line), the asymmetry residuals and size measurements (elliptical r_{petro} shown as a red dashed line), and sky statistics (median and rms in MJy sr^{-1}) with the sky region (orange box). Bottom row (from left to right): the noiseless Sérsic model, the best-fit Sérsic parameters (the galaxy center is shown as a red point, the half-light ellipse derived from the Sérsic model is shown as a solid red line, and orientation of the major axis is shown as a dashed red line), Sérsic residuals, and nonparametric statistics (CAS, Gini, M_{20}) with the Gini segmentation map (red contour) derived as described in Rodriguez-Gomez et al. (2019).

RH9: Coordinated X-ray and UV absorption within the accretion disk wind of the active galactic nucleus PG 1126-041

We present the results of a spectroscopic analysis of eight XMM-Newton observations of the active galactic nucleus (AGN) PG 1126-041 taken between 2004 and 2015, using the most advanced AGN accretion disk wind models available. We used models generated with XRADE (the X-Ray Accretion Disc-wind Emulator developed by Matzeu et al. 2022, MNRAS 515, 6172), that provides a self-consistent treatment of both absorption and emission from a parametrized (non-hydrodynamic) biconical disc wind. For half of our data set, we compare the X-ray analysis results with the results of quasi-simultaneous, high-resolution, spectroscopic UV observations of the C IV complex taken with the Cosmic Origins Spectrograph (COS) on board the Hubble Space Telescope (HST).

We found that the X-ray spectra of PG 1126-041 are complex and absorbed by ionized material, which is highly variable on multiple timescales, from days to years. Accretion disk wind models can account for most of the X-ray spectral complexity, with the addition of massive clumps, represented by a partially covering absorber. Variations in column density ($N_H \sim 5 - 20 \times 10^{22}$ cm^{-2}) of the partially covering absorber drive the observed X-ray spectral variability of PG 1126-041. The UV spectra show three distinct absorption systems, all outflowing with velocities between ~3300 and ~6700 km/s and showing variability between observations as close as 11 days in the source rest-frame (z=0.06). Remarkably, the absorption from the X-ray partially covering gas detected with XMM-Newton and from the blueshifted C IV troughs observed with the HST-COS appear to vary in a coordinated way. During the epochs when the X-ray absorbing column density was at its maximum, the C IV absorber had the maximum equivalent width (EW); during epochs when the X-ray absorbing column density was smaller, the C IV absorber had the minimum EW.

Our results imply that the inner portion of the UV-absorbing wind and the variable X-ray absorber are physically related. This would be expected in radiation-driven scenarios for AGN accretion disk winds, where the large X-ray absorbing column density is a failed wind that acts as a shield for the outer UV-absorbing disk material, allowing for its effective outward acceleration.

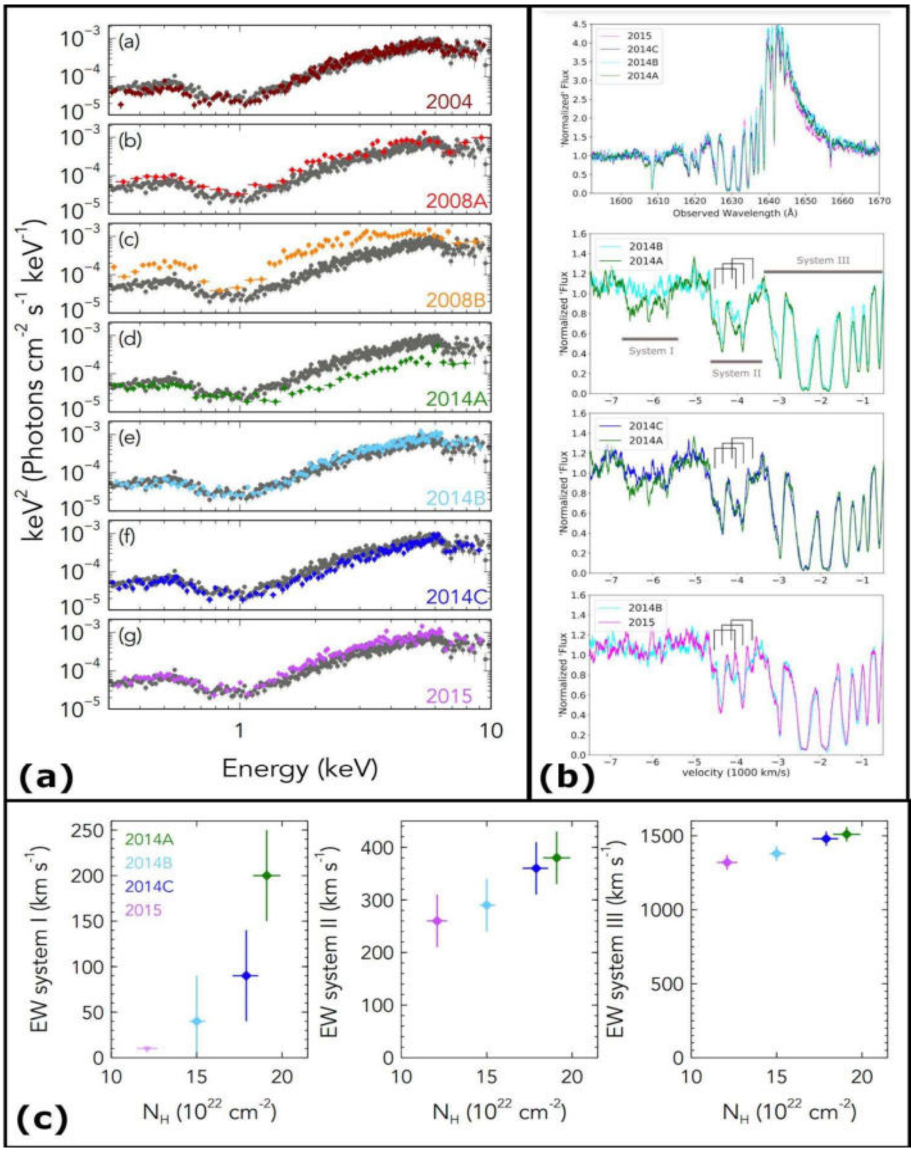


Figure RH9: Coordinated variability of the X-ray absorbing column density of a partially covering ionized absorber and the blueshifted C IV equivalent width (EW) in the active galactic nucleus PG 1126-041. Panel (a): 0.3-10 keV spectra of eighth epochs of XMM-Newton observations. The spectra are well-reproduced by a model consisting of an accretion disk wind plus a partially covering ionized absorber, with the column density N_H of the latter driving the observed spectral variability. Panel (b): HST-COS spectra of the C IV region quasi-simultaneous to the last four XMM-Newton observations. Panel (c): observed relation between the EW of the C IV absorber and the X-ray partially covering absorber column density.

Interstellar and Circumstellar Medium

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Summary

The chemistry in our Galaxy is often determined by UV fields from nearby stars, cosmic rays, shocks, turbulence, and other phenomena. This group aims to obtain a detailed description of the physical and chemical properties of interstellar clouds, circumstellar environments around evolved stars, and protoplanetary disks, to understand the interplay between gas and dust, and to determine the limits of chemical complexity before life emerged on Earth. In particular, reactions leading to complex organic molecules (COMs) are of interest for Astrobiology (objectives O1 and O2). This work is complemented by the development of instrumentation for airborne telescopes (O6).

Astrochemistry is studied following a four-fold approach:

i) ***Observational*** (detection/mapping of simple molecules and COMs, alongside analyses of the physical conditions, structure, and kinematics of interstellar/circumstellar gas and dust, using single-dish telescopes, e.g. IRAM-30m, Yebes, APEX, *JWST,* Robledo de Chavela, etc. and interferometers, e.g. ALMA,

ii) ii) ***Theoretical*** (development of molecular excitation, radiative transfer, chemical models, and MADCUBA code for data analysis),

iii) iii) ***Instrumentation*** (contribution to instrumentation on board future missions, development of KID detectors that operate in mm to far-infrared, and iv) ***Experimental*** (laboratory simulations of ice-covered dust processes leading to COMs in cold interstellar/circumstellar regions using the Interstellar Astrochemistry Chamber (ISAC) and radiation facilities, e.g. NSRRC synchrotron in Taiwan).

COMs were incorporated into comets and other minor bodies of the solar system. Impact of these objects on Earth delivered water and molecules of high astrobiological significance.

Research Highlights 2023:

RH1: Physical properties of methanol (CH_3OH) ice as a function of temperature: density, infrared band strengths, and crystallization

The presence of methanol among the common ice components in interstellar clouds and protostellar envelopes has been confirmed by the *James Webb Space Telescope*. Methanol is often detected in the gas phase towards lines of sight shielded from UV radiation. Using laser interference for determination of the methanol ice thickness, and infrared spectroscopy to estimate the ice column density, we were able to obtain the volumetric density of methanol ice grown under simulated interstellar conditions, at different deposition temperatures and during the ice warm-up. The infrared band strengths are also provided, and the experimental spectra are compared to those computed with a model. The transition from amorphous to crystalline methanol ice was also explored. Finally, we propose new observations of methanol ice at high resolution to probe the methanol ice structure. Previous estimates of the methanol infrared band strength are significantly different because they could not measure the density and simply assumed a value of 1 g cm-3 for this ice. Therefore, our revisited infrared band strengths allow a better estimation of methanol ice column densities in space environments.

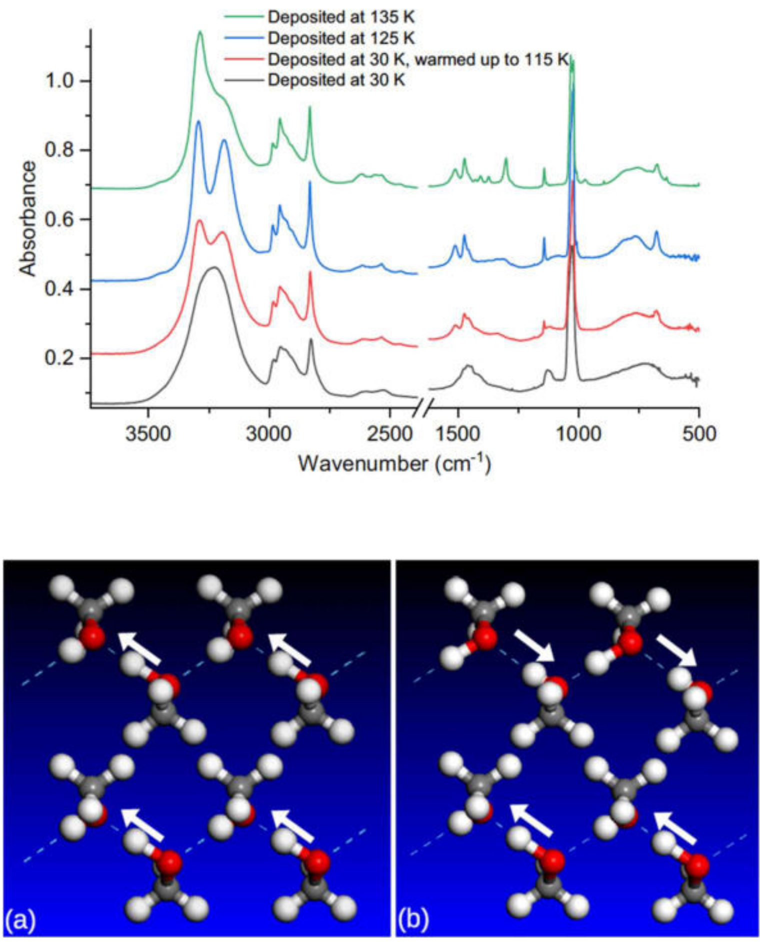

Figure RH1: Main infrared spectra recorded for methanol ice samples. The crystalline structure appearing at 112-113 K during ice warm-up (narrower bands) is more pronounced when ice deposition occurs at 125 K. Deposition at 135 K is however different because it corresponds to another crystalline phase. **Bottom:** α-phase of methanol ice. Dashed lines represent OH-O hydrogen bonds forming methanol chains. Arrows represent the motion of OH stretchings when neighboring chains are in-phase (a) or in counter-phase (b). Adapted from Carrascosa et al. 2023.

RH2: The complex organic molecular content in the L1517B starless core

The goal of this study is to understand how chemical complexity builds up during the initial conditions of Solar-type system formation in starless and prestellar cores. In this work, we study the chemical composition of the gas in Complex Organic Molecules (COMs) toward the starless core L1517B, believed to be at an early stage of evolution. In previous works, it was suggested that different families of COMs (N-bearing and O-bearing COMs) present distinct behaviours depending on the evolutionary stage of the core. In this work, we demonstrate that N-bearing COMs appear first in the gas phase of starless cores while O-bearing COMs appear at a later stage in the collapse phase of these cores (especially at the prestellar stage) as a result of the catastrophic depletion of CO. This work enhances our understanding of the formation of COMs under the coldest conditions in the interstellar medium.

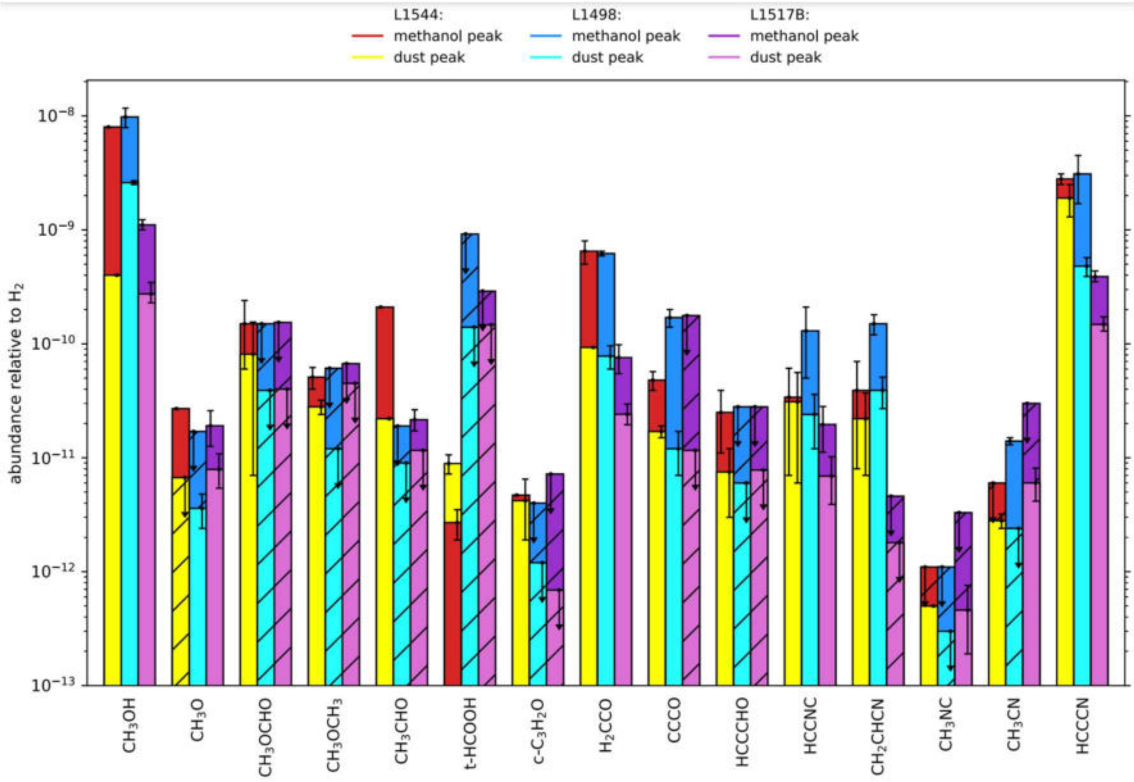

Figure RH2: Comparison of the molecular abundances derived toward three starless cores (L1517B, L1498 and L1544) at different stages of evolution with L1517B being the youngest and L1544, the oldest. We have derived these abundances for the positions of the dust peak (representative of the central parts of the core) and the methanol peak (representative of the location where the catastrophic depletion of CO is taking place). There is a general trend for O-bearing COMs to appear later than N-bearing COMs, because the catastrophic depletion of CO takes a bit longer along the process of the collapse of the core.

RH3: First Glycine Isomer Detected in the Interstellar Medium: Glycolamide (NH2C(O)CH2OH)

Glycine is the simplest representative of amino acids, the building blocks of proteins, which play fundamental catalytic and metabolic roles in biochemistry. Numerous efforts have been focused on the search for glycine in space in recent decades, but they were unfruitful. The non detection of glycine might imply that it is not the most abundant member of the $C_2H_5O_2N$ isomeric family in the ISM. In this work, we have searched for all of the $C_2H_5O_2N$ isomers for which microwave rotational spectroscopy is currently available. We reported the first detection in space of an isomer of glycine, glycolamide ($NH_2C(O)CH_2OH$). The upper limit derived for the abundance of glycine indicates that this amino acid is surely less abundant than its isomer glycolamide in the ISM. While the low abundance of glycine might not be surprising, based on the relative low abundances of acids in the ISM compared to other compounds (e.g., alcohols, aldehydes, or amines), we discussed several viable chemical pathways that can favour the formation of its isomer glycolamide, which include radical–radical reactions on the surface of dust grains favoured by the presence of a high cosmic-ray ionisation rate. My personal contribution to this work includes: original idea, preparation of several of the telescope proposals, reduction and analysis of the data, scientific discussion, and writing of the manuscript.

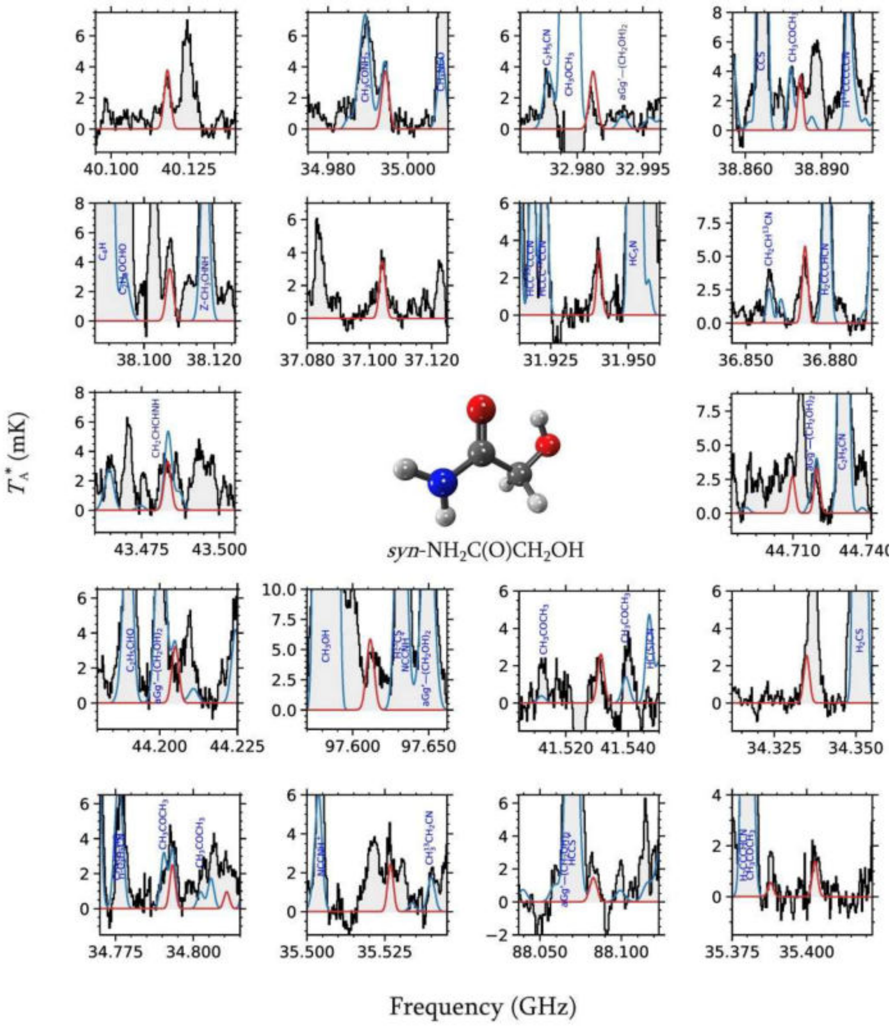

Figure RH3: Unblended or slightly blended transitions of glycolamide detected toward the G+0.693, displayed in order of decreasing line intensity. The observed spectrum is shown as a gray histogram. The best LTE fit derived with MADCUBA for the syn-glycolamide emission is shown with a red curve. The blue curve represents the total modeled emission considering all of the species identified toward this molecular cloud. In the center, the molecular structure of the syn conformer of glycolamide is shown. Carbon atoms are in gray, oxygen atoms in red, nitrogen atoms in blue, and hydrogen atoms in white.

The planetary nebula (PN) NGC 3132 is a striking example of the dramatic but poorly understood mass-loss phenomena that 1–8 Msun stars undergo during their death throes as they evolve into white dwarfs (WDs). In Sahai et al. (2023), we used JWST's multiwavelength imaging to explore the complex structures surrounding the white dwarf at the heart of the PN NGC 3132. Our analysis revealed a previously unidentified, extended dust cloud around the white dwarf, reaching over 2 arcseconds in radial extent, especially visible in the 18 µm band. We propose that this dust originates from a hierarchical triple star system consisting of the WD, a close low-mass companion, and a more distant A2V star. Evidence for this is strengthened by detecting the relative orbital motion of the A2V star, located 1.7 arcseconds northeast of the WD, indicating it is gravitationally bound.

To characterize the dust, we constructed a spectral energy distribution (SED) from UV to mid-infrared wavelengths (0.091–18 µm), estimating a dust mass of approximately 1.3 × 10^{-2} Earth masses with grains that are 70% silicate and 30% amorphous carbon. These findings provide insights into how mass ejections during late stellar evolution shape complex, multipolar PNe and underscore the role of binary and possibly triple systems in forming circumstellar environments as stars transition to their final stages.

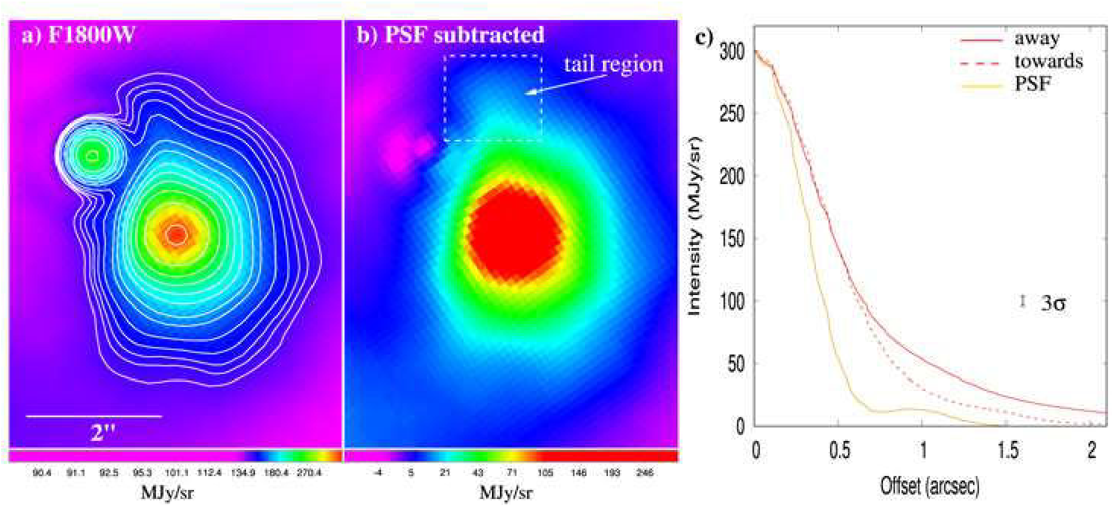

Figure RH4: Images of the dust cloud around the CS, taken with the James Webb Space Telescope, F1800W (Sahai et al. 2023): panel (a) shows the pipeline image (logarithmic stretch) and panel (b) shows the PSF-subtracted image (square-root stretch). Dashed box in panel (b) demarcates the region of the "tail" feature. (c) Radial intensity cuts centered on the CS, averaged over 90° wedges pointing away (solid red curve) and toward (dashed red curve) from the A2V star. Brown curve shows the PSF extracted using a field star

RH5: Gas phase Elemental abundances in Molecular cloudS (GEMS). IX. Deuterated compounds of H_2S in starless cores

The H_2S is predicted to be formed by the hydrogenation of atomic sulphur on grains, and is thought to be the major sulphur reservoir in interstellar ice, making it a key molecule for understanding the sulphur chemistry of the star formation process and solving the missing sulphur problem in molecular clouds and star forming regions. The study of the deuterium fraction of H_2S can be used to constrain grain surface chemistry. We have used observations from the GEMS IRAM 30 m Large Programme and complementary IRAM 30 m telescope observations to study the deuterated compounds of H_2S in a sample of 19 starless cores in the Taurus, Perseus and Orion molecular clouds, detecting HDS in ten of these starless cores and D_2S in five. H_2S single deuteration shows an inverse relationship with cloud kinetic temperature, but no trend is found with molecular hydrogen density or visual extinction. Comparing with other species, we find that in starless cores and Class 0 objects, H_2CS and H_2CO have higher deuteration fractions than c-C_3H_2, H_2S, H_2O and CH_3OH. H_2O has single and double deuteration values an order of magnitude lower than H_2S and CH_3OH. Differences between the c-C_3H_2, H_2CS and H_2CO deuterium fractions and those of H_2S, H_2O and CH_3OH are related to deuteration processes occurring in the gas and solid phases, respectively. We interpret the differences between the H_2S and CH_3OH deuteration and that of H_2O as a consequence of different formation pathways in the solid phase, which can be explained in particular by the different occurrence of D-H and H-D substitution reactions in the ice, together with chemical desorption processes. This work demonstrates the relevance of D-H and H-D substitution reactions in ice for the interpretation of the observation of deuterated species of astrobiological importance, such as H_2S, H_2O and CH_3OH.

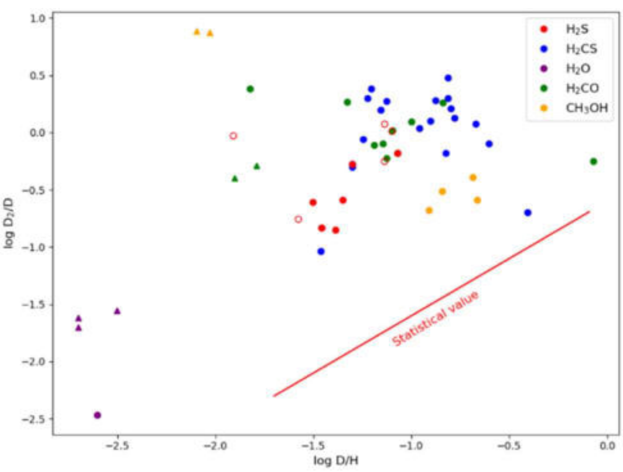

Figure RH5: D/H ratio of double deuterated molecules as a function of the D/H ratio of our selected sample of molecules. In the case of methanol, the single deuterated molecule is CH_2DOH. Circles represent data obtained with single-dish observations, while triangles represent data obtained with interferometric observations. In the case of H_2S, open symbols are the upper limits, corresponding to the sources where only HDS was detected. The red line shows the statistical value if the D atoms were statistically distributed in the molecules formed in the grain surface. The differences between the plotted molecules are explained in terms of its formation (gas phase vs grain surface chemistry) and the efficienty of the H-D and D-H reactions in the ice.

Stars and substellar objects

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Sergio Turrado Prieto

Manuel Alberto Corbinos

Summary

The objectives of the group are the following:

- Search and characterization of high and low mass stars, brown dwarfs and isolated planets in star-forming regions and young star clusters. Search for massive stars with low metallicity.
- Formation and evolution of massive stars.
- Formation and evolution of planetary systems.
- Study of the stellar and substellar mass function of star-forming regions and young star clusters: maximum and minimum mass and dependency on the environment.
- Study and analysis of protoplanetary disks around young stars and brown dwarfs.
- Study and analysis of debris disks, which result from the collision among small bodies and planets around stars of intermediate age.
- Brown dwarf and planetary atmospheres: variability, chemical composition, structure.
- Search for planets using direct and indirect techniques. Spectroscopic confirmations of planet candidates around stars detected through photometric transits.
- Star-planet interactions.

Research Highlights 2023:

RH1: Detection of the isotopologue *$^{15}NH_3$* in a brown dwarf.

Brown dwarfs are excellent laboratories for studying giant planet atmospheres. The detection of $^{15}NH_3$ may provide clues on the planetary formation and evolution mechanisms.

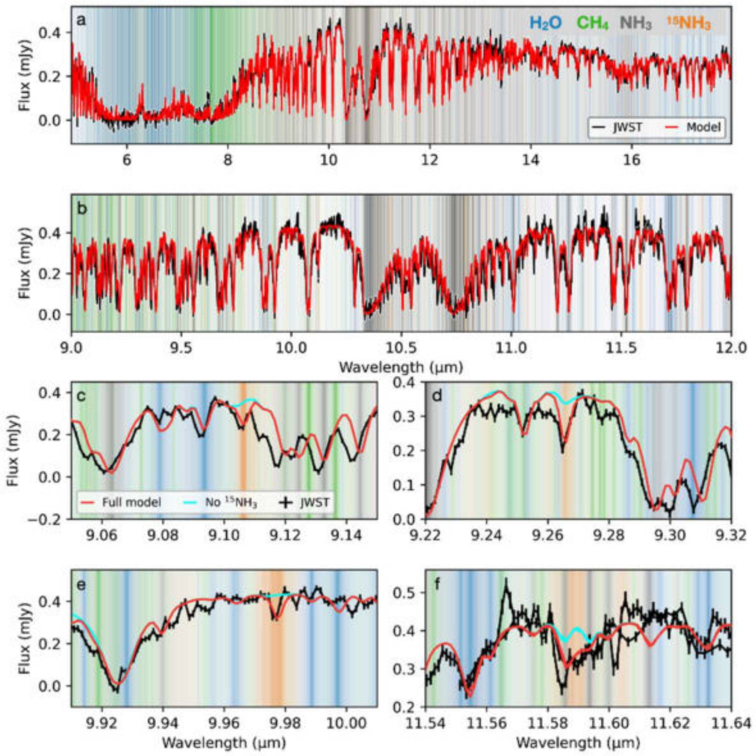


Figure RH1: Panel a) From Barrado et al. 2023, Nature, 624, 263. Synthetic models computed for the full wavelength range of the MIRI observations with spectral resolution of 1000. The rest of the panels show data at the original resolution of MRS. Panel b) Zoom in to show the detection of NH3 at 10 µm. Panels c-f) Individual lines of $^{15}NH_3$ and models with and with $^{15}NH_3$ opacities. Error bars correspond to 1σ uncertainty. Panel f has two MIRI MRS channels plotted together. Colored vertical bands stand for H_2O, CH_4, NH_3, and $^{15}NH_3$ features.

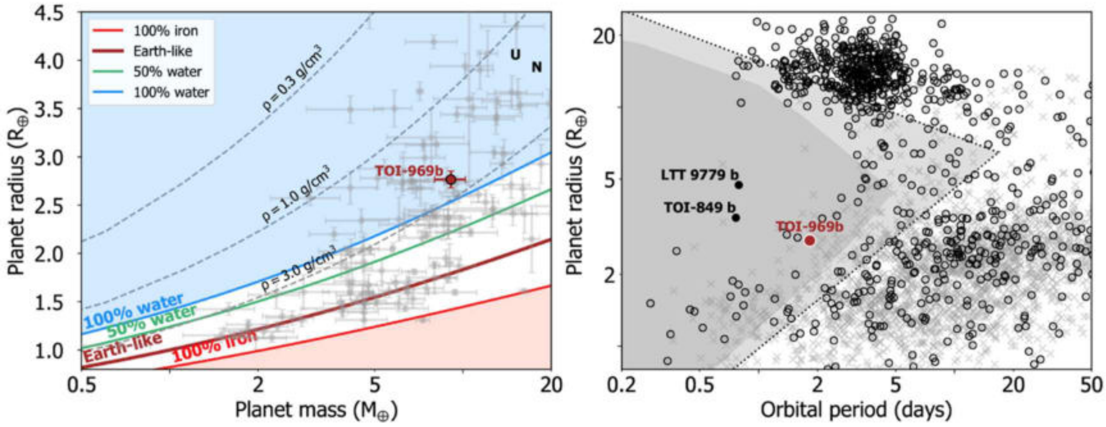


Figure RH2: From Lillo-Box et al. 2023, A&A, 669, A109. Comparative properties of the newly confirmed extrasolar planet TOI-969b in the mass-radius diagram (left panel) and radius-period diagram (right panel). The location in the period-radius diagram establishes this planet in the boundaries of the so-called Neptune desert, a key region to understand processes of planet formation and evolution. This mini-Neptune has a long-period eccentric companion who might be the cause of its inward migration.

RH3: The CARMENES search for exoplanets around M dwarfs. Guaranteed time observations Data Release 1 (2016-2020).

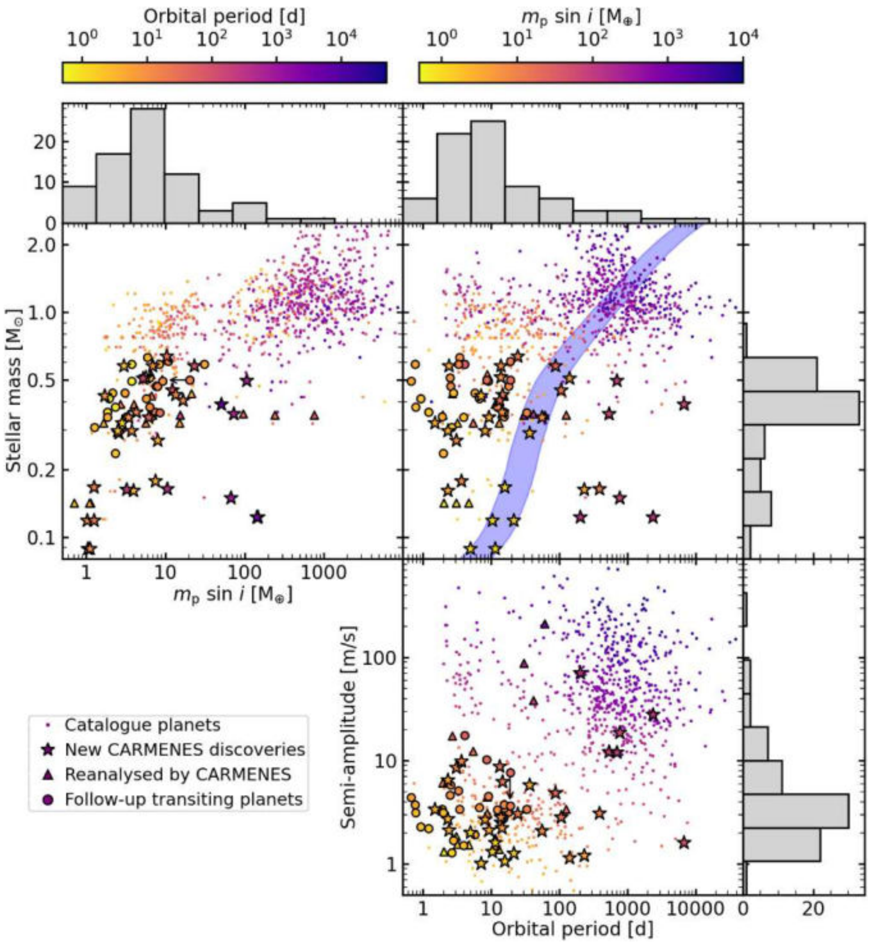


Figure RH3: From Ribas, Reiners, Zechmeister, Caballero, et al. 2023, A&A, 670, 139. In 2023, the CARMENES search for exoplanets around M dwarfs published their Guaranteed time observations Data Release 1, with over 19,000 high-resolution spectra in the optical and the near-infrared collected in 2016-2020. During those five years, CARMENES discovered 33 new planets, re-analysed 17 planets, and confirmed 26 planets from transiting candidate follow-up. CARMENES also updated the planet occurrence rate in the M-dwarf regime at 1.44 ± 0.20 planets with 1 M⨁ < Mpl sin i < 1000 M⨁ and 1 day < Porb < 1000 days per star. From the figure, in short, CARMENES has discovered almost half of the exoplanets known around nearby M dwarfs, including some of those that look like Earth the most or that are the most amenable for atmosphere characterisation with the James Webb Space Telescope.

RH4: Relation between metallicites and spectral energy distributions of Herbig Ae/Be stars.

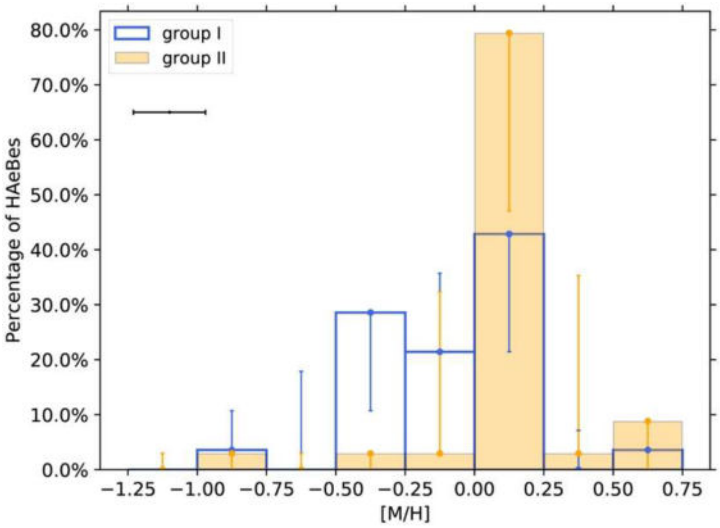


Figure RH4: Detecting planets in protoplanetary disks around young stars is still a very challenging task, for which we have to look for indirect features indicative of their presence. In Guzmán-Díaz et al. (2023, A&A, 671, A140) we looked for such features in a sample of intermediate-mass young stars with disks. The advantage of focusing in this stellar mass regime is that stellar metallicities reflect the metal content of the material recently accreted onto the star, which is not the case for convective stars like the sun or less massive. As it is shown in the figure, we find that the intermediate-mass stars hosting disks with signatures of giant planet formation -so called “Group I”- tend to have smaller metallicities than the rest -“Group II”-. This result supports the hypothesis that giant planets trap the most metallic material in the disk, leading to an under-abundance of metallic elements in the material accreted by the central star. This study paves the ground for direct detections of planets in protoplanetary disks, providing a best-suited sample for this purpose.

RH5: Characterisation of the upper atmospheres of HAT-P-32 b, WASP-69 b, GJ 1214 b, and WASP-76 b through their He I triplet absorption.

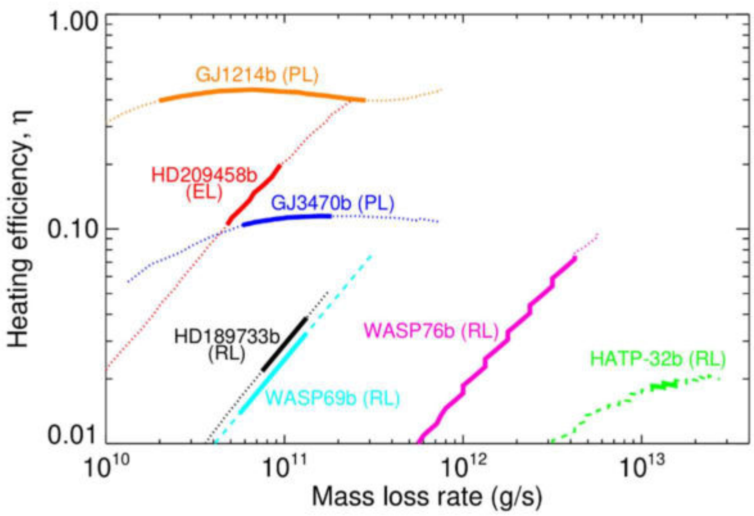


Figure RH5: Characterizing exoplanets atmospheres through the He I 10830 triplet. The planet parameters yield different efficiency of photoevaporation. From López-Puertas, Lampón, Sanz-Forcada et al. A&A 673, A140

RH6: High-angular resolution observations of the disk around ß Pictoris.

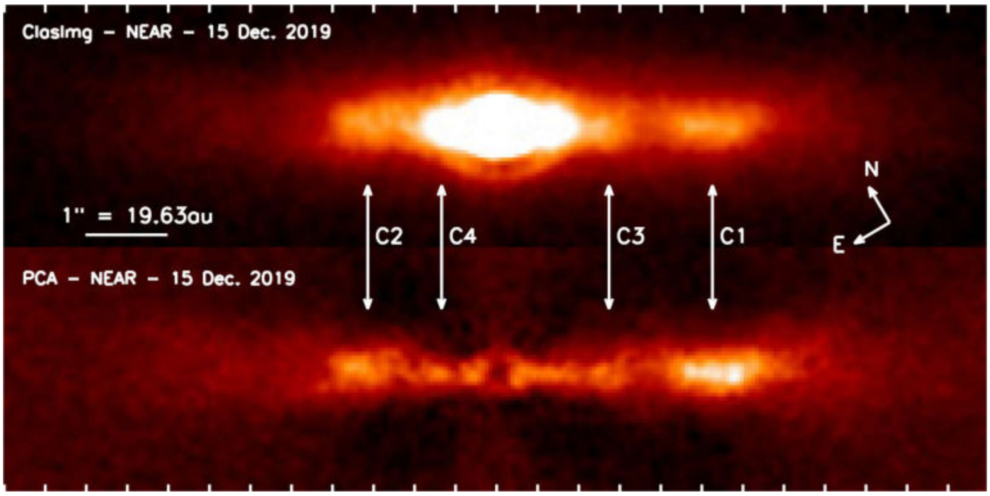
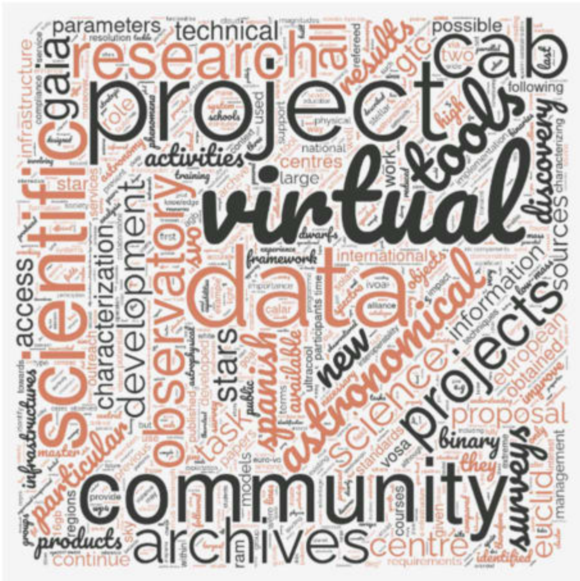


Figure RH6: High-angular resolution observations of the disk around ß Pictoris obtained at 12 µm with VLT/VISIR (top panel). The bottom panel shows the image after post-processing with PCA removing most of the emission from the central star. The observations have allowed us to study the presence of substructures within the disk: the arrows and labels indicate different dust clumps, including the well-known southwest clump (C1). Using a 16-yr baseline, sampled with five epochs of observations, we were able to examine the evolution of the clump, that orbits with a Keplerian motion with a semi-major axis of 56 au. In addition to the known clump, the images clearly show the presence of a second clump on the northeast side of the disk (C2) as well as possibly fainter and closer structures that are yet to be confirmed.

Virtual Observatory: Scientific exploitation of astronomical archives



Group coordinator: Enrique Solano Márquez

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Summary

This group contributes to objective O6 of Center Strategic Plan by addressing the question of the development of transdisciplinary mechanisms for data discovery and analysis (including Artificial Intelligence) in the framework of the Virtual Observatory, Big Data and the European Open Science Cloud. The group also plays an important role to fulfill the objectives O1 and O2.

The following research highlights exemplify the most relevant investigations and results in the group.

Research Highlights 2023

RH1: M dwarf stars in the b294 field from the VISTA Variables in the Vía Láctea (VVV)

M dwarf stars are the dominant stellar population in the Milky Way, and they are important for a wide variety of astrophysical topics. The present work aims to identify and characterize M dwarf stars in the direction of the Galactic bulge using photometric data and with the help of Virtual Observatory tools. Using parallax measurements and proper motions from Gaia Data Release 3, in addition to different colour-cuts based on VISTA filters, we identify and characterize 7 925 M dwarf stars in the b294 field from the Vista Variables in the Vía Láctea (VVV) survey. We performed a spectral energy distribution fitting to obtain the effective temperature for all objects using photometric information available at Virtual Observatory archives. The objects in our sample have temperatures varying from 2800-3900 K. We also search for periodic signals in VVV light curves with up to 300 epochs, approximately. As a secondary outcome, we obtain periods for 82 M dwarfs. These objects, with periods ranging from 0.14-34 d, are good candidates for future ground-based follow up. Our sample has increased significantly the number of known M dwarfs in the direction of the Galactic bulge and within 500 pc (from 208 identified in Gaia DR3 to 7 925), showing the importance of ground-based photometric surveys in the near-infrared.

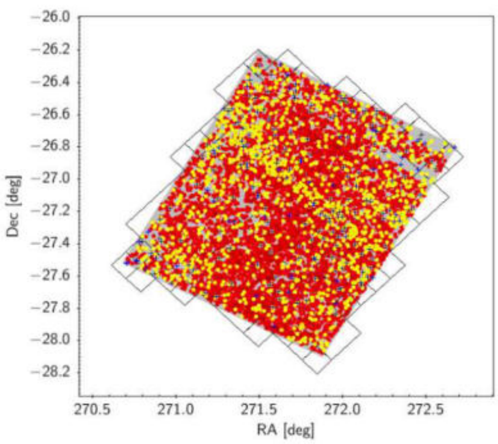


Figure RH1: Sky position of the 7 925 M dwarf stars in our sample. The VVV tile b294 is presented as a grey area and the solid black lines represent its MOC. Blue crosses show the M dwarfs identified in Gaia DR3 within 500 pc.

RH2: Title: Spectral classification of the 100 pc white dwarf population from Gaia-DR3 and the virtual observatory

The third data release of Gaia has provided low-resolution spectra for ~100 000 white dwarfs (WDs) that, together with the excellent photometry and astrometry, represent an unrivalled benchmark for the study of this population. In this work, we first built a highly complete volume-limited sample consisting in 12 718 WDs within 100 pc from the Sun. The use of VO tools like VOSA allowed us to perform an automated fitting of their spectral energy distributions to different atmospheric models. In particular, the use of spectrally derived Javalambre-Physics of the Accelerating Universe Astrophysical Survey photometry from Gaia spectra led to the classification of DA and non-DA WDs with an accuracy >90 per cent, tested in already spectroscopically labelled objects. The excellent performance achieved was extended to practically the whole population of WDs with effective temperatures above 5500 K. Our results show that while the A branch of the Gaia WD Hertzsprung-Russell diagram is practically populated by DA WDs, the B branch is largely formed by non-DAs (65 per cent). The remaining 35 per cent of DAs within the B branch implies a second peak at ~0.8 M⊙ in the DA mass distribution. Additionally, the Q branch and its extension to lower temperatures can be observed for both DA and non-DA objects due to core crystallization. Finally, we derived a detailed spectral evolution function, which confirms a slow increase of the fraction of non-DAs as the effective temperature decreases down to 10 500 K, where it reaches a maximum of 36 per cent and then decreases for lower temperatures down to ~31 per cent.

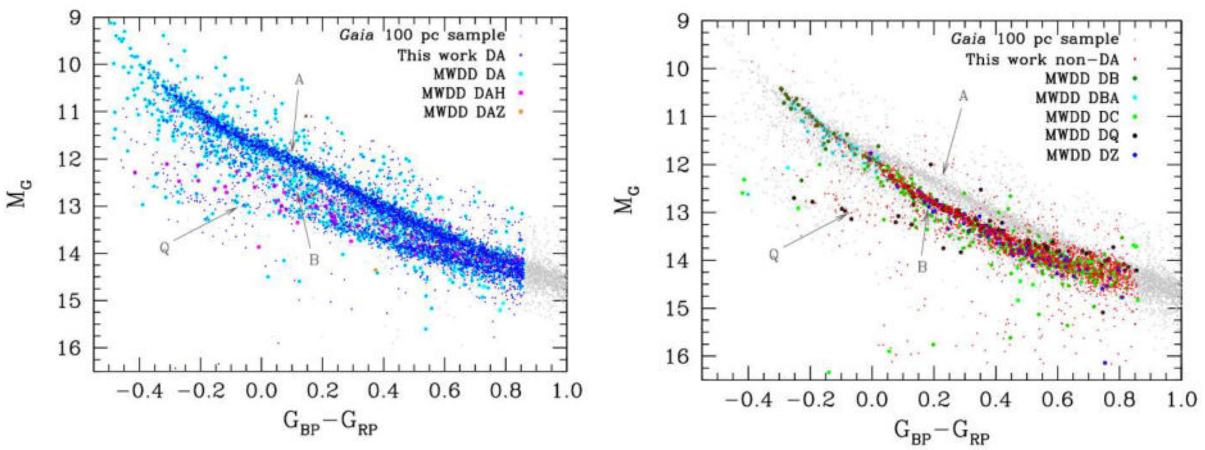


Figure RH2: *Gaia HR diagram for the DA (left panel; blue dots) and non-DA (right panel; red dots) WDs classified in this work. Also plotted, for comparative purposes, our entire Gaia 100 pc sample (grey dots) and those classified in several spectral types in the Montreal White Dwarf Database (MWDD). The A, B, and Q branches are pointed for helping in the discussion.*

RH3: The Calar Alto CAFOS direct imaging first data release

The first release of the Calar Alto CAFOS direct imaging data contains 23 903 reduced and astrometrically calibrated images taken from 2008 March to 2019 July. The catalogue associated to 6132 images in the Sloan griz filters provides accurate astrometry and PSF calibrated photometry for 139 337 point-like detections. The mean internal astrometric and photometric accuracies are 0.05 arcsec and 0.04 mag, respectively. In this work we describe the approach followed to process and calibrate the images, and the construction of the associated catalogue, together with the validation quality tests carried out. Finally, we present three cases to prove the science capabilities of the catalogue: discovery and identification of asteroids, identification of potential transients, and identification of cool and ultracool dwarfs.

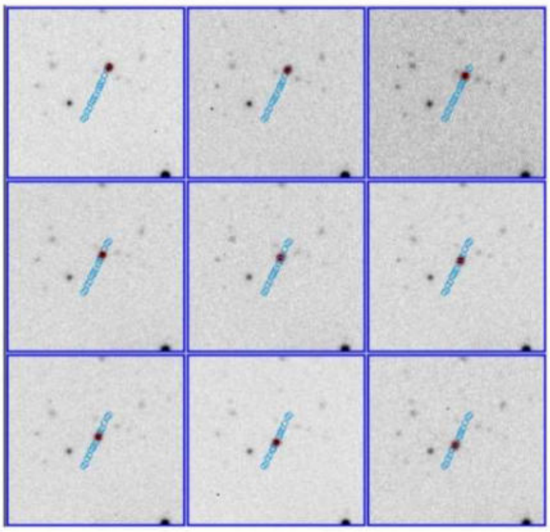
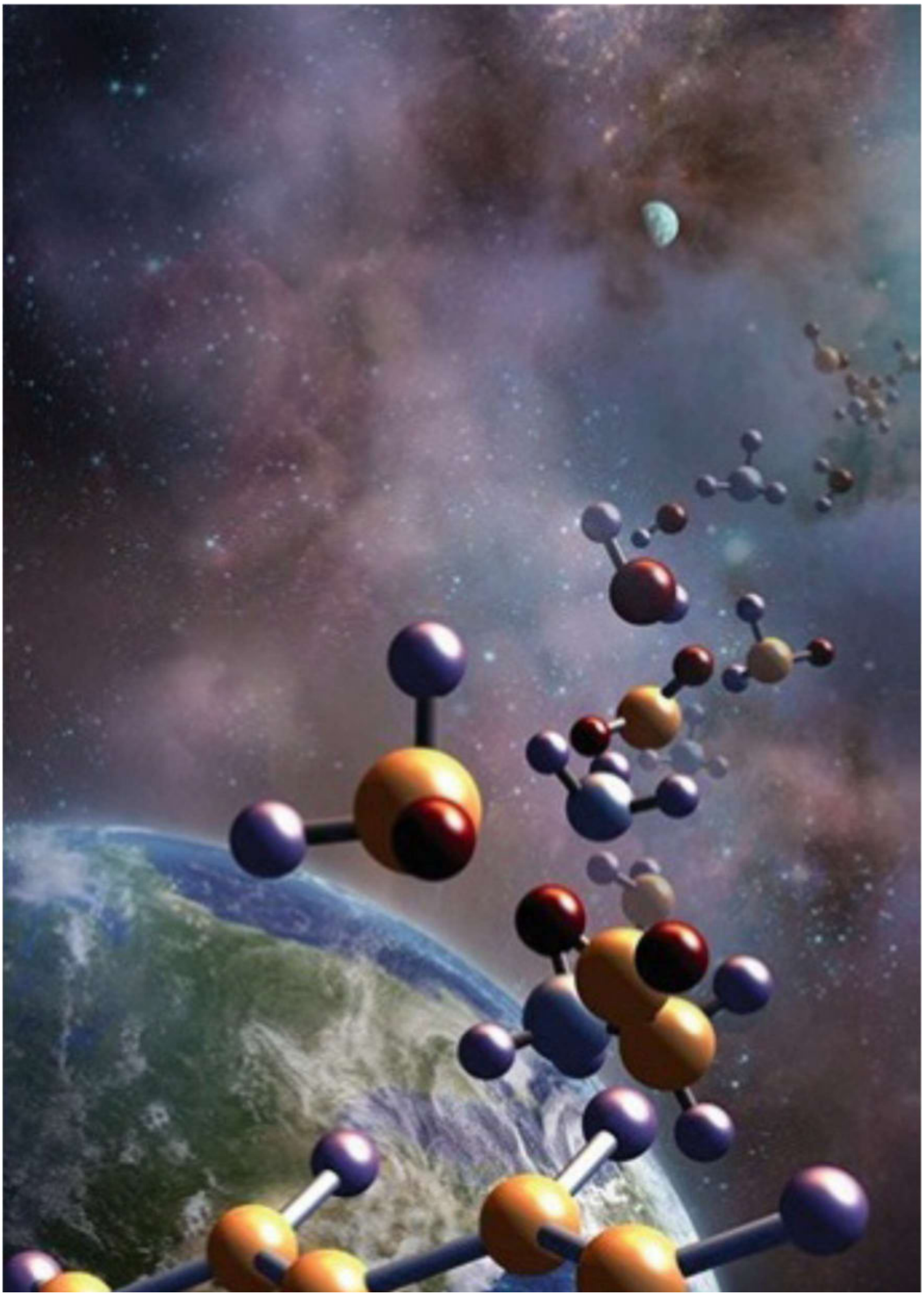


Figure RH3: Example of linear motion of the Apollo asteroid Sisyphus during nine consecutive images. The temporal coverage of the full set is of near 46 min. The epoch increases from left to right and from top to bottom. The proper motion of the asteroid is 41.5′′/h . The blue circles indicate the trajectory of the asteroid while the red circles indicate the current asteroid position in the image.

Molecular Evolution

Department of



Head of Department: Ester Lázaro

Currently, life on Earth manifests in multiple forms, and is distributed over a wide variety of environments with diverse physicochemical conditions. The study at the molecular level of the processes that have made possible the emergence of such a high degree of biological diversity on an initially inert planet is the main objective of the research carried out in the Department of Molecular Evolution. This is structured in six research groups:

1. Prebiotic Chemistry and Physics of Complex Systems
2. Molecular Evolution, RNA World and Biosensors
3. Experimental Evolution Studies with Viruses and Microorganisms
4. Microbial Diversity
5. Molecular Mechanisms of Biological Adaptation
6. Biomolecules in Planetary Exploration

The research coordinated among these groups aims to give answers to fundamental questions related to the generation of the precursor molecules of life -including those responsible for storing and transmitting genetic information-, the mechanisms that direct biological diversification, or the simulation of evolutionary processes in the laboratory. Finally, another major objective of the department is aimed at the implementation of technologies for the detection of biomolecules and processes related to life on other planets of our Solar System.

Prebiotic Chemistry and Physics of Complex Systems

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Jacobo Aguirre.

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Rocío Gallardo Martínez

Andrés del Castillo Álvarez

Summary

The Prebiotic Chemistry and Physics of Complex Systems group is concerned with the study of the chemical and physical aspects regarding the possible origins of life and its evolution on Earth, as well as with aspects related with the increase of molecular complexity and habitability on other planetary environments in the Solar System. These objectives are pursued from a completely transdisciplinary perspective exploiting the connection between areas of expertise such as prebiotic chemistry, the physics and chemistry of surface science, the use of non-equilibrium and stochastic thermodynamics in symmetry breaking phenomena in chemistry and physics, and the modelling of reaction-diffusion-advection processes and fluid mechanics. We also pursue complexity theory, whose complementarity in the context of Astrobiology has not been sufficiently developed until only recently. Our methods range from experimental work simulating conditions on the primitive Earth to planetary environments in the Solar System, with an emphasis on liquid water interfaces, interaction of biomolecules on mineral surfaces and chemical reactivity, to the mathematical modeling of complex processes, supported by computation based on the use of experimental and observational data.

The research carried out by our group contributes to objectives **O1.4**, **O2**, **O2.1, O3.2**, **O5**, **O5.2**, **O5.3**, **O5.5** and **O5.6** of the strategic plan.

Research Highlights 2023

RH1: Conditions for the origin of homochirality in primordial catalytic reaction networks

In this work, we study the generation of homochirality in a general chemical model (based on the homogeneous, fully connected Smoluchowski aggregation-fragmentation model) that obeys thermodynamics and can be easily mapped onto known origin of life models (e.g. autocatalytic sets, hypercycles, etc.), with essential aspects of origin of life modeling taken into consideration. Using a combination of theoretical modeling and numerical simulations, we look for minimal conditions for which our general chemical model exhibits spontaneous mirror symmetry breaking. We show that our model spontaneously breaks mirror symmetry in various catalytic configurations that only involve a small number of catalyzed reactions and nothing else. Of particular importance is that mirror symmetry breaking occurs in our model without the need for single-step autocatalytic or mutual inhibition, which may be of relevance for prebiotic chemistry. For more information, see JS Gagnon, **D Hochberg**, *Conditions for the origin of homochirality in primordial catalytic reaction networks*, Scientific Reports **13** (1), 9885, 2023.

RH2: Chiral symmetry breaking and entropy production in Dean vortices

The chemistry of life on Earth is based on a basic asymmetry of certain molecules whose three-dimensional geometrical structure or conformation is not identical to that of their mirror image. Parity P, or space inversion, a discrete spatial symmetry transformation of fundamental physics, is broken at the molecular level. Such molecules are said to possess chirality or handedness. The mirror image structures of a chiral molecule are called enantiomers. Homochirality is ubiquitous in biological chemistry from its very start. Amino acids, the building blocks of proteins, and the sugar backbones present in DNA and RNA, are chiral molecules. The origin of biological homochirality has intrigued the scientific community ever since its initial discovery by Pasteur. To unravel its possible origin, we have conducted a combined theoretical and numerical study on the physics of fluid flows in curved pipes. In such coiled ducts, hydrodynamic flows develop a net chirality which can then be transmitted, via viscous shear forces, to the level of molecular self-assembly. This establishes a purely fluid-mechanical mechanism of mirror symmetry breaking from the fluid flow to the constituent molecules. More details in *Chiral symmetry breaking and entropy production in Dean vortices*, I.Herreros and **D.Hochberg**, Physics of Fluids, 35(4):043614,2023.

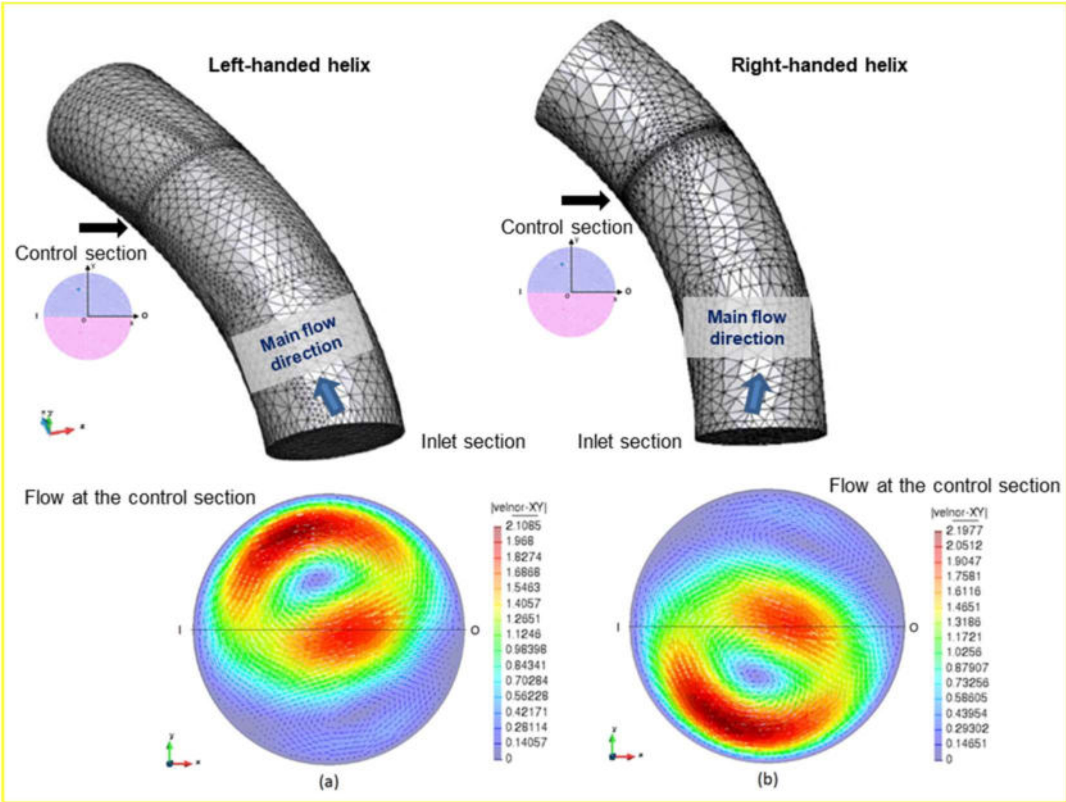


Figure RH2: Helical pipes (pitch = 10 Re = 50 De = 35): (top) 3D helical geometries; (bottom) flow velocity at the control sections located at a distance 2h/10 from the inlets: (a) left-handed helix and (b) right-handed helix. (I: Inner boundary; O: Outer boundary)

RH3. Study of the complex chemical evolution of phosphorus in the interstellar medium.

We introduce and analyze a model of the P-chemical network in an interstellar diffuse cloud. We employ a novel and productive association between complex network theory, Bayesian statistics and astrochemistry to improve existing astrochemical models by significantly decreasing their level of parameter uncertainty. Through this approach, we attain a deeper understanding of the formation of chemical precursors for organic macromolecules in space. In collaboration with Izaskun Jiménez-Serra (CAB). For more details, see *A theoretical approach to the complex chemical evolution of phosphorus in the interstellar medium*, M Fernández-Ruz, I Jiménez-Serra and J Aguirre, The Astrophysical Journal **956** (1), 2023.

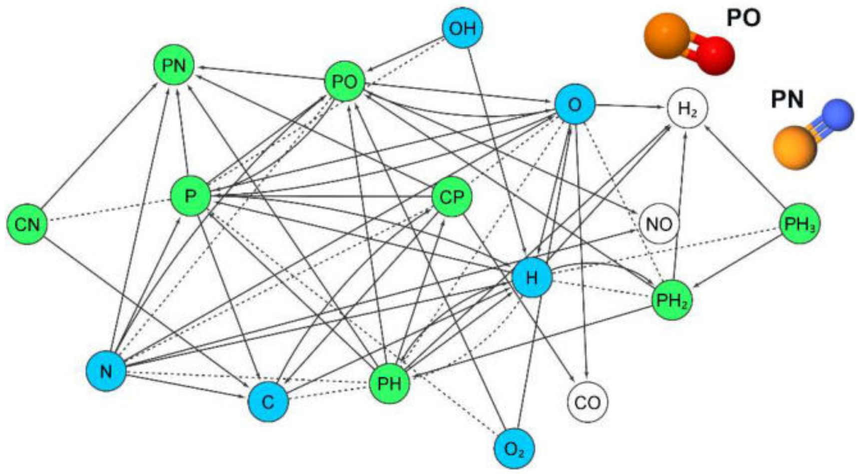


Figure RH3: Phosphorus astrochemical network. In this work, we study the abundance evolution of P-bearing species in the interstellar medium and focus on the dependences of the astrobiologically relevant PO and PN on the system's kinetic parameters. As a result, our model reveals that the formation of PO and PN is governed by just a few critical reactions, and fully explains the relationship between PO and PN throughout the evolution of molecular clouds.

RH4. Study of the interaction between the protein co-expression networks of four large DNA viruses and human cells during a viral infection.

In this work, our aim is to bridge the gap between the system-level perspective of viral infection processes and their dynamics, by reconstructing and investigating the topological and dynamical features of virus-host protein co-expression networks. We take advantage of a formal framework, the theory of competing networks, to describe the viral infection as a dynamical system taking place on a network of networks where perturbations induced by viral proteins spread to hijack the host proteome for the virus benefit. We believe that this approach can complement more standard analytical approaches for quantitative temporal viromics, and provide useful insights into the viral and host's temporal organization and strategies, key protein nodes targeted by the virus and dynamical bottlenecks during the course of the infection. In collaboration with Raúl Guantes (UAM). For more information, see *Virus-host protein co-expression networks reveal temporal organization and strategies of viral infection,* J Aguirre, R Guantes, iScience **26** (12), 108475, 2023.

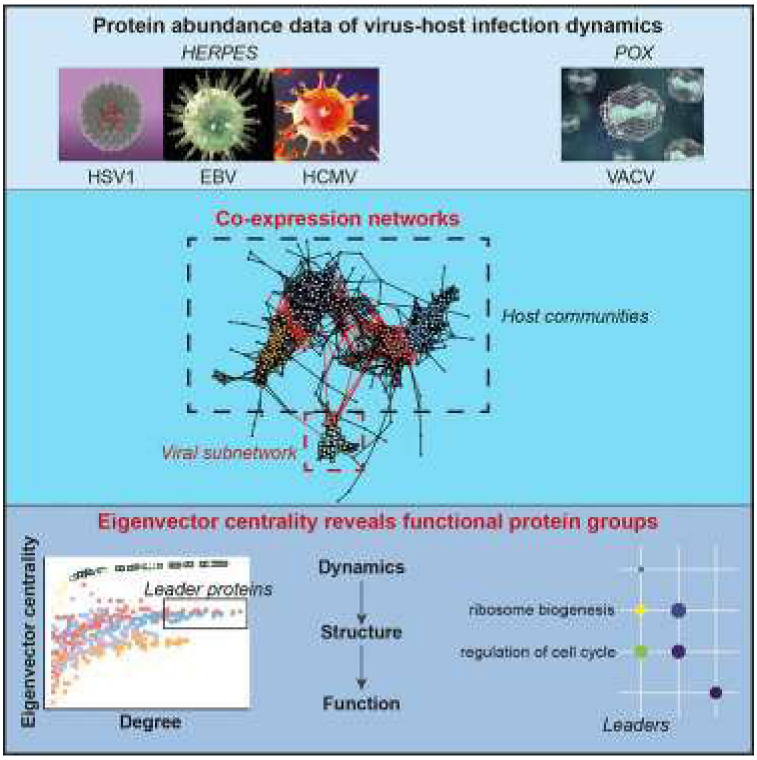


Figure RH4: Graphic abstract of the study of the interaction between the protein co-expression networks of four large DNA viruses and a human cell during a viral infection.

RH5: Role of the cation ammonium in the complex wet chemistry of the cyanide

Prebiotic chemistry one-pot reactions, such as HCN-derived polymerizations, have been used as stimulating starting points for the generation of new multifunctional materials due to the simplicity of the processes, use of water as solvent, and moderate thermal conditions. Slight experimental variations in this special kind of polymerization tune the final properties of the products. In this work, the influence of NH_4Cl on the polymerization kinetics of cyanide under hydrothermal conditions and on the macrostructures and properties of this complex system was explored. The kinetics of the process was consistent with an autocatalytic model, but important variations in the polymerization reaction were observed according to a simple empirical model based on a Hill equation. The differences in the kinetic behaviour against NH_4Cl were also revealed when the structural, morphological, thermal, electronic and magnetic properties of the synthesized cyanide polymers were compared. As a result, this hydrothermal prebiotic polymerization was not only pH dependent, as previously thought, but also ammonium subservient. The results discussed on this paper expanded the knowledge on HCN wet chemistry, offered an extended view of the relevant parameters during the simulation of hydrothermal scenarios and described the production of promising paramagnetic and semiconducting materials inspired by prebiotic chemistry. *PCCP* **2023**, *25*, 20473.

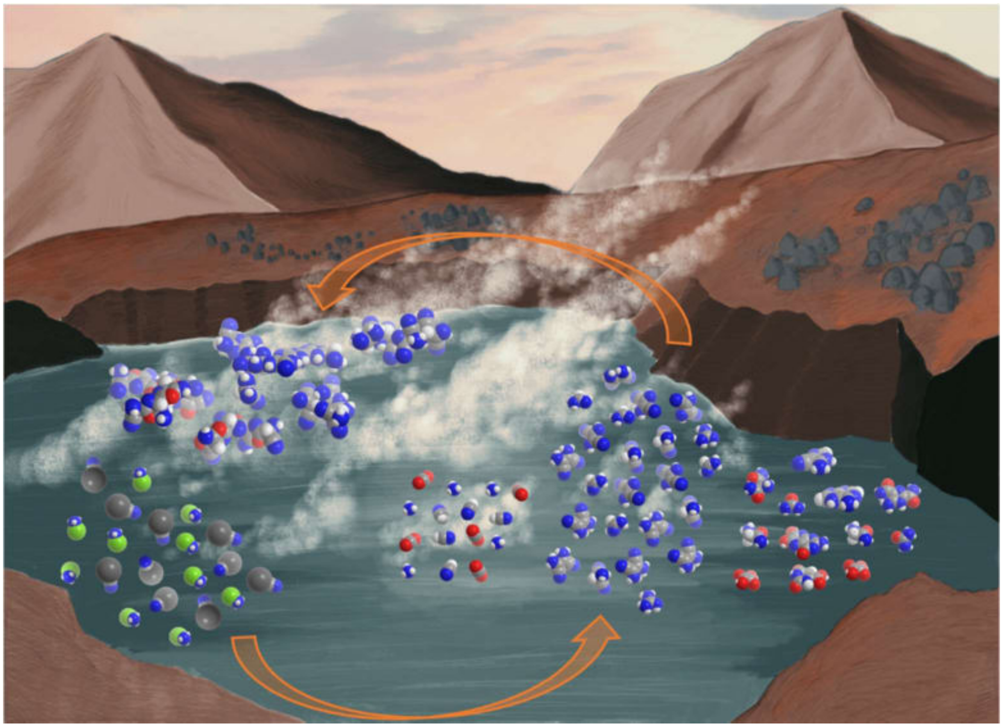


Figure RH5: Back-cover illustrating the complex chemistry of the cyanide in hydrothermal systems under the influence of the ammonium cation (PCCP **2023**, 25, 20473).

RH6: Statistical analysis of the hydrothermal syntheses of HCN polymers

In this work, for the first time, chemometrics was applied to the recently reported microwave-driven cyanide polymerization. Fast, easy, robust, low-cost, and green-solvent processes are characteristic of these types of reactions. These economic and environmental benefits, originally inspired by the constraints imposed by plausible prebiotic synthetic conditions, have taken advantage of the development of a new generation of HCN-derived multifunctional materials. HCN-derived polymers present tunable properties by temperature and reaction time. However, the apparently random behavior observed in the evolution of cyanide polymerizations, assisted by microwave radiation over time at different temperatures, leads us to study this highly complex system using multivariate analytical tools to have a proper view of the system. The obtained consistent statistical results indicated that microwave-driven polymerization is a more robust process than conventional thermal syntheses but also that plausible prebiotic chemistry in alkaline subaerial environments could be more complex than in the aerial part of these systems, presenting a clear example of the "messy chemistry" approach of interest in the research about the origins of life. In addition, the methodology discussed in this paper could be useful for the data analysis of extraterrestrial samples and for the design of soft materials, in a feedback view between prebiotic chemistry and materials science. *Polymers* **2023**, *15*, 410.

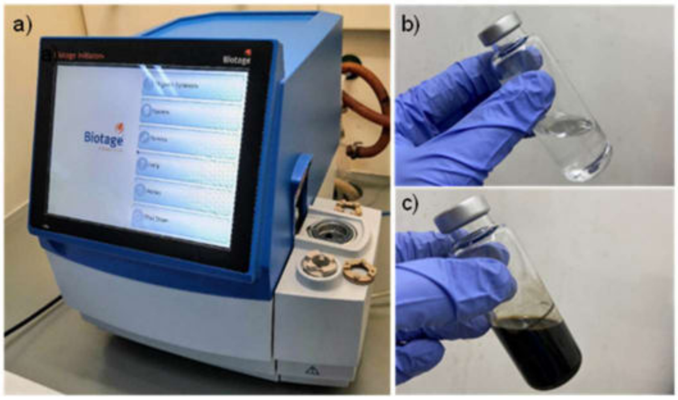


Figure RH6: Microwave reactor for organic syntheses; b) Water solution of cyanide plus ammonium chloride; c) Crude reaction after heating of the solution showed in b.

RH7: A New Approach in Prebiotic Chemistry Studies: Proline Sorption Triggered by Mineral Surfaces Analysed Using XPS

We have performed the first spectroscopic characterization of L-proline adsorption on a battery of mineral surfaces such as montmorillonite, olivine, iron sulphide and haematite, which is relevant to prebiotic chemistry. In this research, specific mineral-organic interactions have been described by XPS, IR and XRD; the adsorbed chemical forms and their charge could force the functional groups more kindred to the mineral surface, thus leaving the groups less reactive with the mineral free and available to activate chemical reactions with other molecules, leading to an increase in chemical complexity.

Our studies provide insight into the understanding of a wide range of chemical environments that would be prebiotically viable by concentrating precursor molecules and their subsequent reactivity due to the specific structure of each mineral. In addition, it is important to search for minerals with the highest molecular concentration potential, as well as those capable of protecting the molecules in their structure from UV damage. Therefore, the location of these minerals would be the planetary sites most likely to detect organic molecules. This study confirms the potential of clays such as montmorillonite to preserve and concentrate simple biomolecules such as amino acids, as well as pushing the chemistry governing molecular interaction.

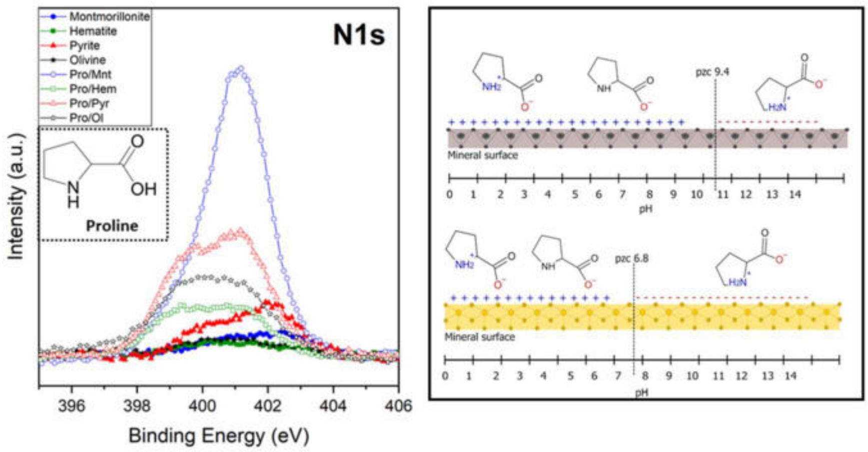


Figure RH7: XPS nitrogen signal of the four minerals, before and after the adsorption of proline on montmorillonite, olivine, haematite, and iron disulphide; inset of proline molecular structure. The Scheme shows a summary of the interactions between L-proline (anion or zwitterion) and montmorillonite and pyrite mineral surfaces (from top to bottom). Life 2023, 13(4), 908.

RH8: Design, Synthesis, and Computational Studies on the effect of Surface Organo-Silanization on SBA-15 Mesoporous Silicas in CO2 Adsorption Processes: Nanosensors for space exploration

The present work aims to provide some guidance in the construction of functionalized mesoporous materials oriented for CO_2 capture. Carbon dioxide solid sorbents produced from mesoporous functionalized silica microparticles (SBA-15) have been investigated (i) theoretically using density functional theory and (ii) evaluated empirically for assessing their CO_2 adsorption capacity. Two different families of organosilyl groups have been tested possessing a common anchoring group (silanol), in one extreme, but bearing two different types of CO_2 sensitive groups in the other extreme; (i) hyperbranched polymeric PAMAM moieties, carrying multiple $-NH_2$ groups, and (ii) a collection of linear functional ending groups such as $-SH$, $-SO_3H$, −guanidine (Gdn), $-NH_2$, $-NCO$, and $-N_3$.

Adsorption isotherms revealed that SBA-15 bearing (3-aminopropyl)triethoxysilane (APTES) showed an impressive 3.4-fold adsorption enhancement compared to the pristine SBA-15, following a straightforward synthetic protocol. Computational calculations here presented gave insight to the unexpected, limited adsorption capacities shown by sulfur-based materials; in addition, interesting results were also observed in the energy profile of SBA-15@NH2 vs SBA-15@ Gdn, thus suggesting the latter to be more efficient in the CO_2 adsorption experiments. Therefore, functionalised mesoporous materials are relevant platforms for future development of detection CO2 nanosensors for space and planetary exploration. *Ind. Eng. Chem. Res.* 2023, 62, 28, 11001.

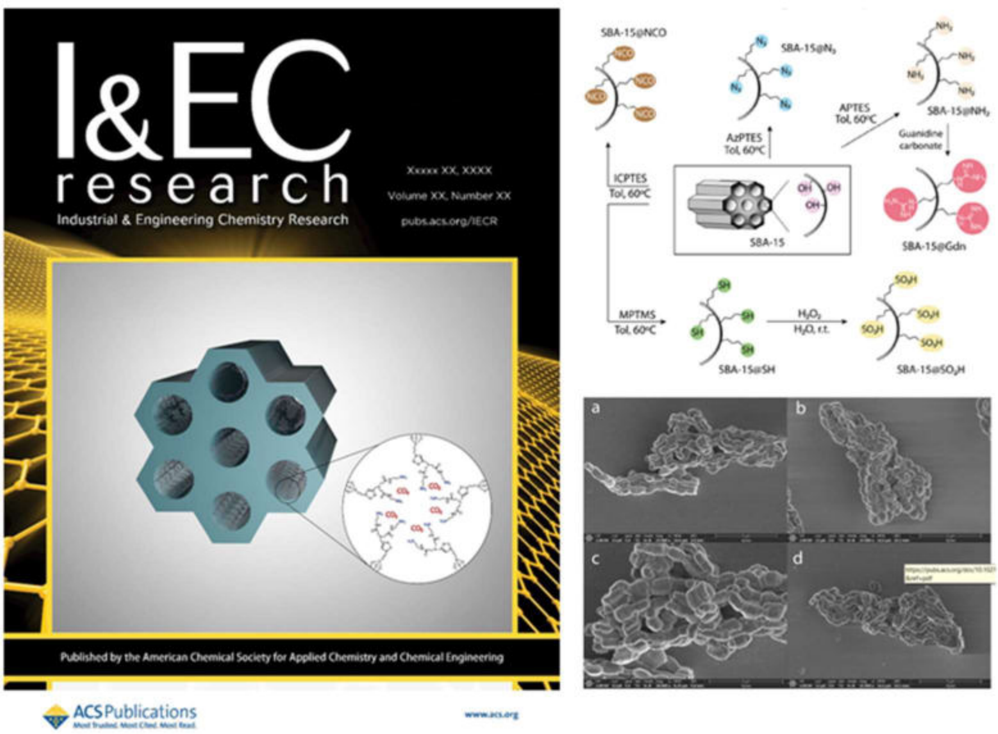
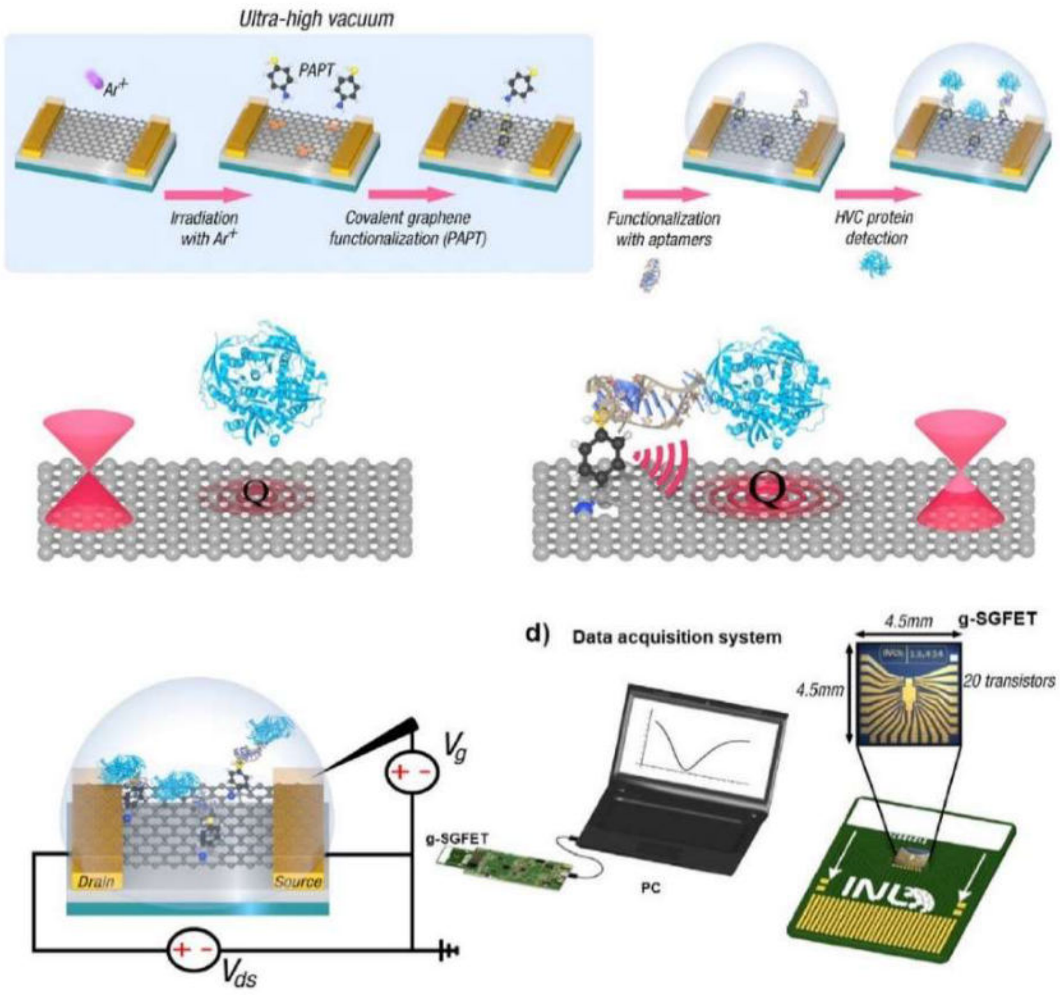


Figure RH8: Left:Front-cover illustrating the 3D cross-sectional representation for a hexagonally ordered structure and organosilyl groups for CO_2 capture (*Ind. Eng. Chem. Res.* 2023, 62, 28, 11001-11015). Right: Surface Modification of SBA-15 with Different Organosilyl Groups and SEM images of (a, c) SBA-15 (zoomed), (b) SBA-15@PAMAM, and (d) SBA-15@NH2. Sputter-coated with 5 nm of chrome.

Molecular Evolution, RNA World and Biosensors



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Yolanda Blanco

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María Martínez Orosa

Summary

The research group *Molecular Evolution, RNA World and Biosensors* contributes to the objectives O2, O4, O5, and O6 of CAB's Strategic Plan by addressing the following questions: i) collaborating with the Astrochemistry group to characterize molecular precursors of the RNA world in the interstellar medium; ii) developing experimental approaches and contributing to *in silico* models to abiotically polymerize ribonucleotides at mineral-water interfaces (including clay minerals) as well as in other complex media, within the framework of our research in prebiotic systems chemistry; iii) characterizing the dynamics and evolution of RNA virus quasispecies under different selective pressures, and analysing the use of certain RNA virus sequences and activities as 'archaeological tools' to unveil ancient molecular relationships; iv) conducting *in vitro* selection of RNA and DNA aptamers against various molecular targets, including amino acids and other low molecular weight biomolecules, astrobiologically-relevant peptides and proteins, as well as viral proteins; v) developing ultrasensitive, aptamer-based graphene biosensors with applications in biotechnology and astrobiology; vi) collaborating with other CAB groups to characterize biodiversity in the Río Tinto subsurface.

The following research highlights showcase the most significant investigations and results of the group during 2023.

Research Highlights 2023:

RH1: Development of experimental systems and in silico models for the abiotic polymerization of ribonucleotides

One of the lines of research of this group is to study the processes that might have led to the establishment of the RNA world, within the conceptual framework of prebiotic systems chemistry for the origin of life. In 2023, in collaboration with the Group of Organic Chemistry led by Andrés de la Escosura (UAM, Madrid), we have optimised experimental systems for the abiotic polymerisation of RNA oligonucleotides from cyclic ribonucleotides (cAMP, cGMP and their mixtures). Different phyllosilicates (clays) have been used as mineral substrates, working at different pH levels and ionic strengths. X-ray diffraction has been used to study the structural alterations produced in the clay as a result of the absorption of these monomers. The possible polymerisation was analysed by electrophoresis (Agilent Bioanalyzer 2100 system), HPLC and mass spectrometry (manuscript in preparation). In parallel to this ongoing work, we have collaborated with Jacobo Aguirre (CAB's Prebiotic Chemistry and Complex Systems Physics Group) in the development of computational systems that could explain the process of abiotic polymerisation of ribonucleotides, as well as the template-dependent replication of the oligomers generated (manuscript in preparation).

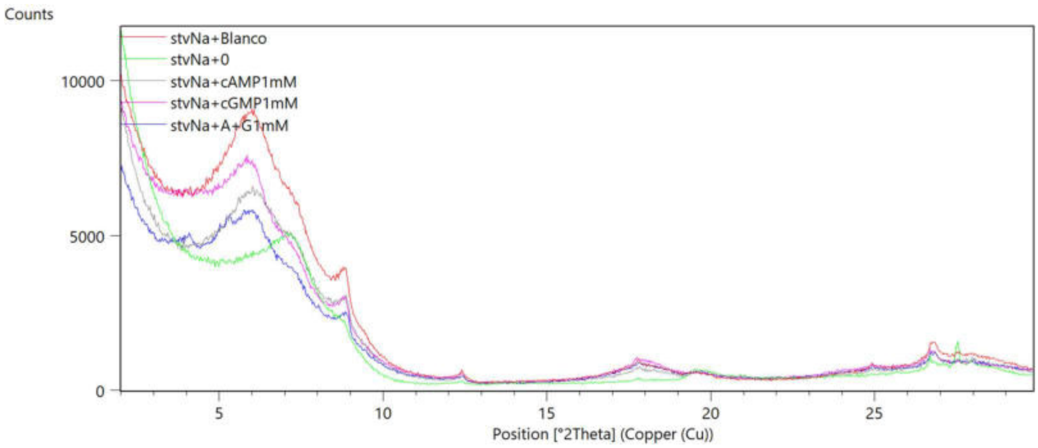

Figure RH1: Study of the interlamellar spacing in stevensite clay (Stv) after adsorption of cAMP or cGMP, by means of X-ray diffraction.

RH2: Evolution of virus RNA quasispecies under different selective pressures

RNA virus quasispecies provide suitable models for investigating the population dynamics of RNA molecules during the RNA World. In collaboration with the groups of Esteban Domingo (CBMSO, CSIC-UAM, Madrid) and Jordi Gómez (IPBLN, CSIC, Granda), we have investigated quasispecies dynamics for the last years. Using hepatitis C virus (HCV) as a model system, we provided evidence that the antiviral drug sofosbuvir (SOF) can act as a mild mutagen and that such mutagenic activity is largely abolished when it is tested with high fitness HCV (Martínez-González et al., 2023).

In parallel, we have used certain RNA virus sequences and activities (including ribozymes) as ‘archaeological tools’ to unveil ancient molecular relationships in some cellular mRNAs and viral RNAs which likely share a common origin. The sequence of such structural/functional RNA elements was preserved within the linear information of nucleic acid molecules that is translated into proteins (Ariza-Mateos et al., 2024a). Additionally, we have studied how information concepts derived from physics and computer science allow understanding ‘meaningful-information’ at a molecular level, thus connecting viral genetics with natural language research. We have compared such theories with the neo-Darwinian treatment of genetic information to explain the rapid evolution of RNA viruses (Ariza-Mateos et al., 2024b).

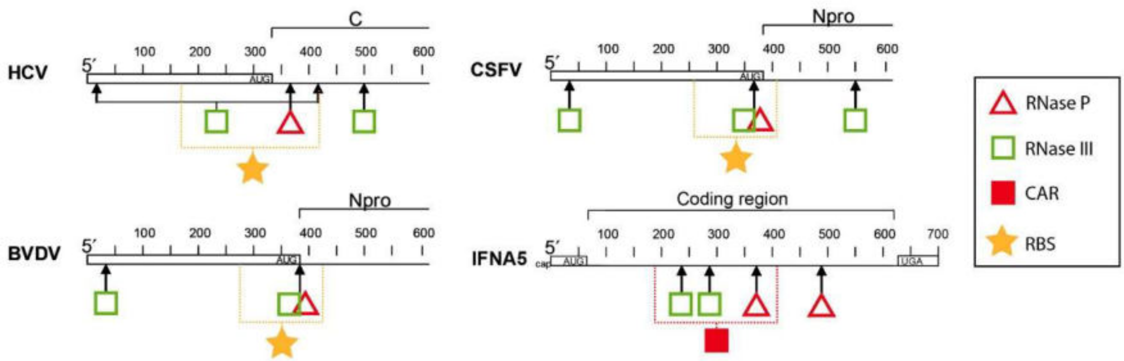

Figure RH2: Schematic representation of the 5’genomic regions of HCV, bovine viral diarrhoea virus (BVDV), classical swine fever virus (CSFV) and the complete interferon alpha 5 mRNA (IFNA5), showing the conserved functional sites that interact with four molecular signals: RNase P, RNase III, cytoplasmic accumulation signal (CAR) and ribosomal binding site (RBS) (Adapted from Ariza-Mateos et al., 2024a).

RH3: Development of ultrasensitive graphene-based biosensors

We have set up and optimized different experimental systems for the *in vitro* selection and evolution of RNA and DNA molecules, focused on the production of aptamers against various kinds of molecules of interest in biotechnology and astrobiology. During 2023, we have finished the selection and characterization of DNA aptamers targeting conserved peptides present in metal-binding proteins. These aptamers will allow developing biosensors capable of detecting biomarkers in extreme environments, useful in planetary exploration (manuscript in preparation).

Additionally, we have used our previously developed anti-HCVcore aptamers (in particular, the DNA aptamer showing the highest affinity and specificity for its protein target) to build graphene-based aptasensors with unprecedented attomolar (10^{-18} M) sensitivity for detecting the viral protein (Palacio et al., 2023). This work has been done in collaboration with research groups from the International Iberian Nanotechnology Laboratory (INL, Braga, Portugal), Institute of Physics (Czech Academy of Sciences, Prague, Czech Republic) and Institute of Materials Science of Madrid (ICMM, CSIC). The continuation of this interdisciplinary project focuses on the development of such ultrasensitive biosensors for the detection of biomarkers in different biotechnological and astrobiological applications.

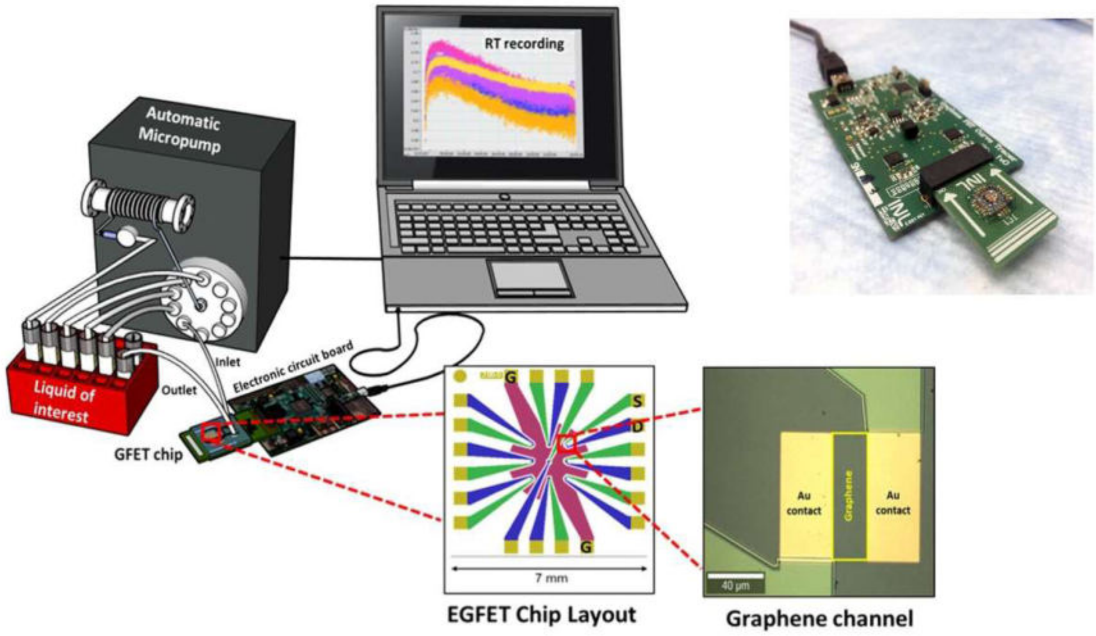

Figure RH3: Scheme of the electronic system used to read the graphene-based aptasensors we are developing. Top-right image shows the actual appearance of the biosensor chip attached to the electronic board.

Experimental evolution studies with viruses and microorganisms

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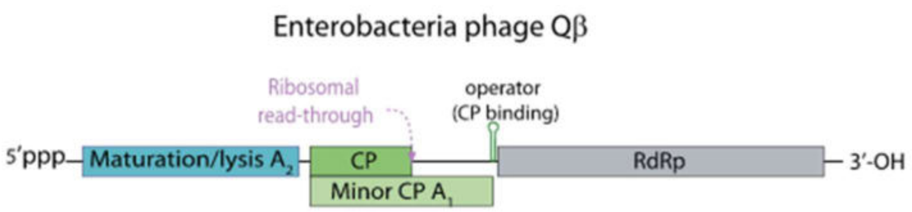
Lorena Aznarán Alcántara

Summary:

This group contributes to objective 5 (O5) of Center Strategic Plan. In order to understand how life has diversified since its origin, it is essential to understand the fundamental principles governing adaptation to diverse environments. Consequently, the recreation of evolutionary processes in controlled laboratory settings, utilizing simple organisms that evolve rapidly, has facilitated significant advancements in identifying the relationships between environmental parameters, genetic changes, and specific adaptations.

Our experimental model is bacteriophage Qβ, a lytic virus that infects the bacterium *Escherichia coli* using as receptor the conjugative F pilus. Qβ possesses a single-stranded, positive-sense RNA genome spanning 4217 nucleotides that encodes four proteins: A2 (or maturation protein), which mediates phage binding to the bacterial pili, penetration of the viral genome and cell lysis; coat protein, serving as the major capsid protein; A1 (or minor capsid protein), occasionally produced when the stop codon of the capsid protein is interpreted as tryptophan; and the replicase, responsible for RNA genome replication. Evolutionary experiments carried out in our group are usually focused on analyzing the genotypic and phenotypic changes experienced by Qβ when it is propagated under the particular conditions whose influence on evolution we want to analyze. The following research highlights exemplify the most relevant investigations and results in the group during the year 2023.



Research Highlights 2023:

RH1: The balance between fitness advantages and costs drives adaptation of bacteriophage Qβ to changes in host density at different temperatures

In a previous study, it was demonstrated that bacteriophage Qβ could adapt to replicate at bacterial concentrations lower than those typically used in the lab when temperature was the optimal one (37°C). Adaptation occurred via a mutation in the A1 protein (C2011A), facilitating virus entry into bacteria. In this new study, the adaptive strategies of Qβ when bacteria densities are lower than optimal were investigated at two other temperatures (30°C and 43°C) Evolution at 30°C consistently selected mutation C2011A in the A1 protein, while at 43°C, mutation U830C in the A2 protein was selected. Both mutations enhanced the formation of infectious center at the three temperatures assayed (30°C, 37°C and 43°C). However, U830C presented fitness costs at 30°C and 37°C, probably due to the prolonged latent periods that resulted of a less efficient interaction of mutated A2 with the cellular protein MurA. In contrast to this, mutation C2011A posed fitness costs at 43°C, potentially due to non-productive interactions of the viral particles with cellular debris. Evolution experiments at non-selective temperatures confirmed the temperature-dependent selection of mutations. Overall, adaptation of Qβ to reduced host availability involves mutations enhancing virus entry into bacteria, with selection being influenced by trade-offs between advantages and fitness costs at different environmental conditions.

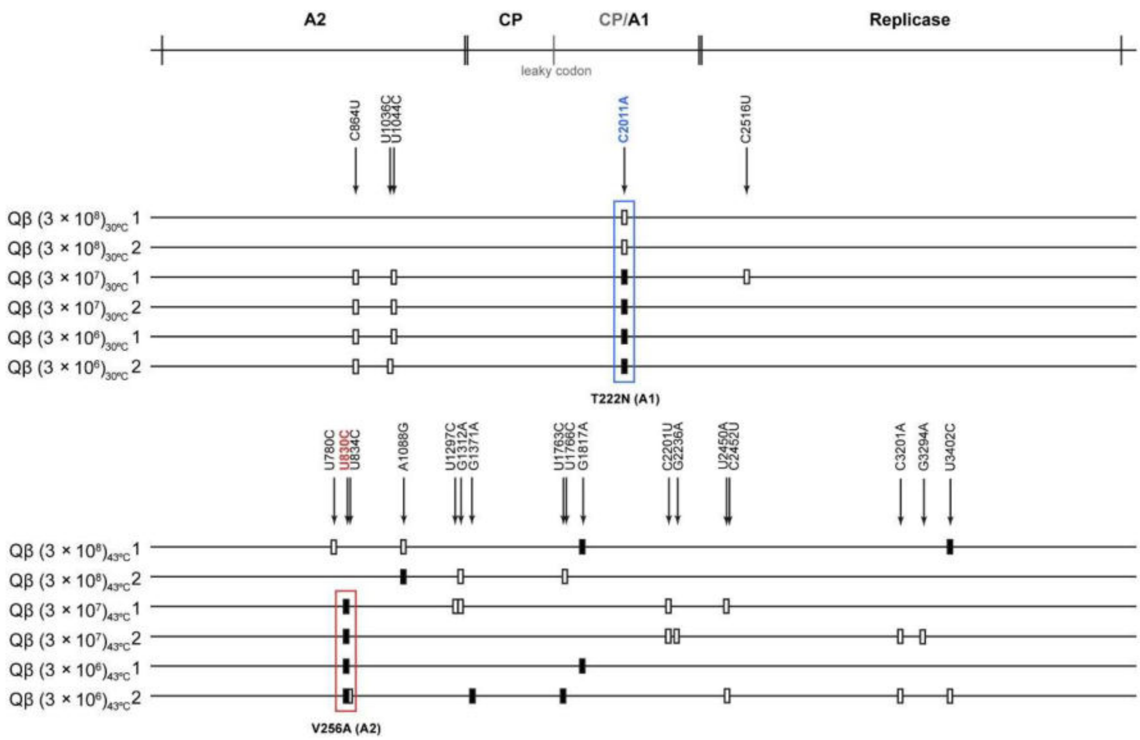


Figure RH1: Mutations detected in the consensus sequence of the evolutionary lineages of bacteriophage Qβ. The most frequently detected mutation during evolution at 30°C, (C2011A, T222N in the A1 protein) is marked with a blue rectangle, whereas the most common mutation during evolution at 43°C (U830C, V256A in the A2 protein) is marked with a red rectangle.

Bacteriophage fitness is determined by factors influencing both their replication within bacteria and their ability to maintain infectivity between infections. The latter becomes particularly crucial under adverse environmental conditions or when host density is low. In such scenarios, the damage experienced by viral particles could lead to the loss of infectivity, which might be mitigated if the virus undergoes evolutionary optimization through replication. In this study, we conducted an evolution experiment involving bacteriophage Qβ, wherein it underwent 30 serial transfers, each involving a cycle of freezing and thawing followed by replication of the surviving viruses. Our findings show that Qβ was capable of enhancing its resistance to this selective pressure through various adaptive pathways that did not impair the virus replicative capacity. Notably, these adaptations predominantly involved mutations located within genes encoding capsid proteins. The adapted populations exhibited higher resistance levels than individual viruses isolated from them, and the latter surpassed those observed in single mutants generated via site-directed mutagenesis. This suggests potential interactions among mutants and mutations. In conclusion, our study highlights the significant role of extracellular selective pressures in driving the evolution of phages, influencing both the genetic composition of their populations and their phenotypic properties.

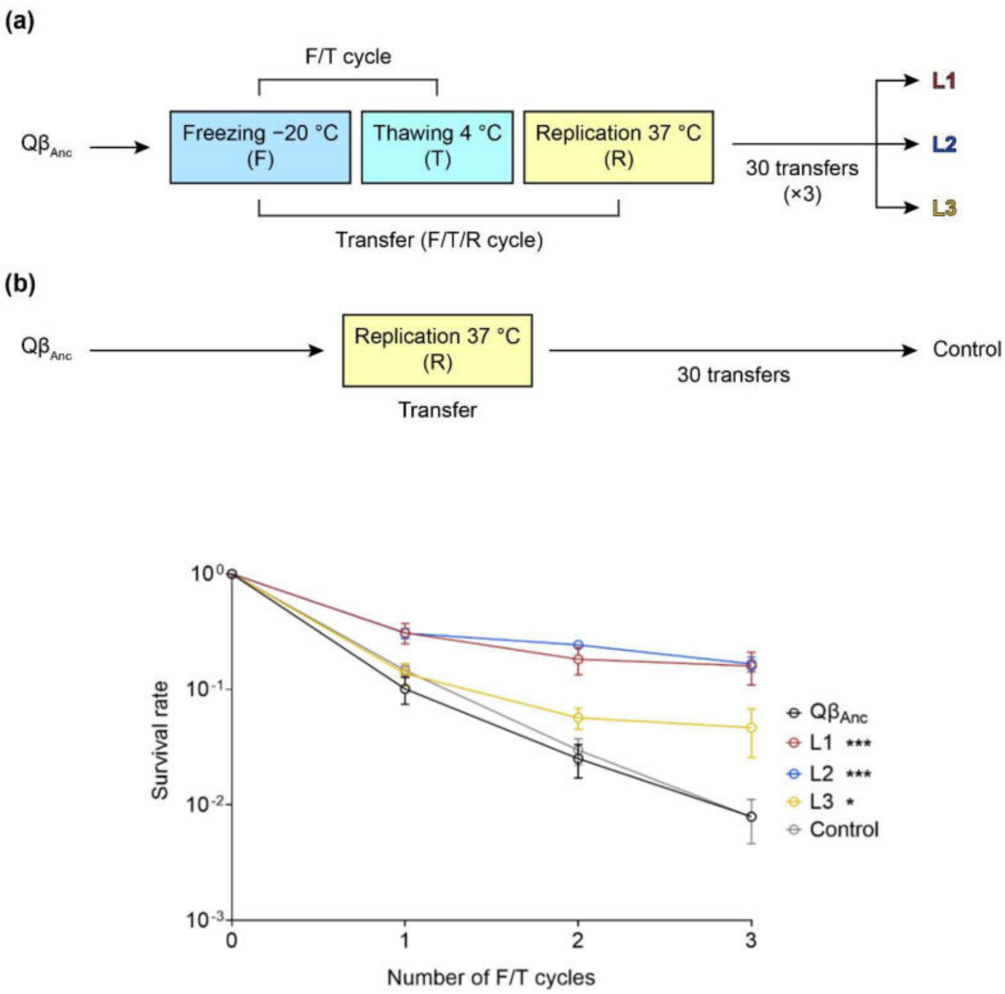


Figure RH2: Upper pannel**:** Scheme showing the evolution experiment performed with bacteriophage Qβ. (a) The virus $Q\beta_{Anc}$ was propagated in triplicate through 30 serial transfers consisting of freezing at – 20 °C, thawing at 4 °C, and amplification of the surviving viruses in a standard replication assay. The lines obtained were denoted L1, L2, and L3 (evolved lines). (b) The virus Qβ$_{Anc}$ was propagated through 30 serial transfers that did not include freezing and thawing. In this way, a control line was obtained whose properties were compared with those of the ones evolved through F/T/R cycles. Bottom pannel: Survival rate of the three Qβ evolved lines (L1, L2, and L3), the control line, and the virus Qβ$_{Anc}$. Each line was subjected to three consecutive F/T cycles. The survival rate was calculated with respect to the initial amount of virus

RH3: Evolution of bacteriophage Qβ under conditions of microgravity

Gravity is a factor that has remained constant, both in direction and magnitude, throughout the evolution of life on Earth. However, recent advances in space exploration have brought to the forefront the study of how terrestrial life could adapt to different gravity conditions. The present work is a first approach to studying the effect of continuous alteration in the direction of gravity (which in practice is equivalent to recreating microgravity conditions) on infections caused by bacteriophage Qβ. A 3D clinostat designed by Sergio Martín Blázquez, a student from the Universidad Politécnica de Madrid who has completed his TFM at CAB, is being used for this purpose. Our preliminary results show that Qβ infections on semi-solid agar produce lower viral titers when they occur in the clinostat than when they occur in the usual incubator. After 10 transfers in which infections were carried out in semi-solid medium under microgravity conditions in the clinostat, the virus selected mutation C2011A, which we know increases virus entry into bacteria. We are currently analyzing whether the selective value of this mutation in microgravity conditions is due to a worse diffusion of the virus, to a worse interaction with the cellular receptor or to the induction of a physiological state in the bacteria that makes them less sensitive to infection.

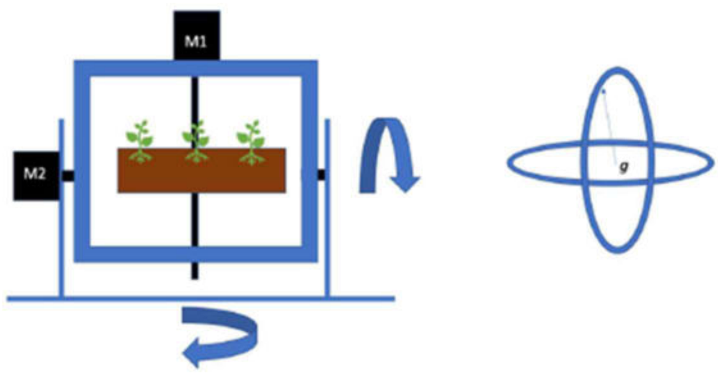


Figure RH3: Scheme of the 3D clinostat used to simulate microgravity conditions. The 3D clinostat consists of two perpendicularly positioned motors that rotate the cylinder and the frame at a constant speed. The speed can be controlled independently for each motor and in this way the desired trajectory can be formed by combining the two speeds. Credits: Sergio Martín Blázquez.

Microbial Diversity

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Radoslaw B. Dudzia

Summary:

This group contributes to objective "O5. To understand the basic principles of life in planetary environments, its early evolution and adaptability to diverse and often extreme conditions", of Center Strategic Plan by addressing the question of how metabolic diversity has occurred as well as its molecular adaptations to the extreme environmental physicochemical parameters. The following research highlights exemplify the most relevant investigations and results in the group.

This group contributes to objective "O5. To understand the basic principles of life in planetary environments, its early evolution and adaptability to diverse and often extreme conditions", of Center Strategic Plan by

addressing the question of how metabolic diversity has occurred as well as its molecular adaptations to the extreme environmental physicochemical parameters. The following research highlights exemplify the most relevant investigations and results in the group.

Research Highlights 2023:

RH1: The cycle of aerosols on Mars and Earth, a comparative study. Implications for life and planetary protection

The objective of this project is to investigate the atmospheric dispersion of mineral, organic and biomass aerosols in the Earth's atmosphere and surface, serving as a case study analogous to similar phenomena occurring on Mars. The specific objectives are as follows:
(a) Exploration of the biodiversity and microbial dispersion associated with Saharan dust intrusions.
(b) Examination of the molecular mechanisms conferring resistance to ultraviolet radiation, including an analysis of the possible protective role of dust and the molecular responses triggered under Martian conditions in the Mars Simulation Chambers and in the space environment.
(c) Isolation of micro-organisms from spacecraft assembly cleanrooms.
(d) Isolation of micro-organisms present in the stratosphere using hot-air balloons.
(e) Exploration of molecular mechanisms activated under Martian conditions in Simulation Chambers both on Mars and in the space environment.

To date, we have established a comprehensive database of atmospheric microbial diversity obtained from sampling at various scenarios and meteorological stations, covering both Saharan intrusion and non-intrusion periods. In addition, we have compiled a culture collection comprising microorganisms isolated during Saharan intrusions, as well as isolates from cleanrooms and the stratosphere. Ongoing efforts include the evaluation of the resistance of these microorganisms to various extreme conditions, including those representative of the Martian atmosphere.

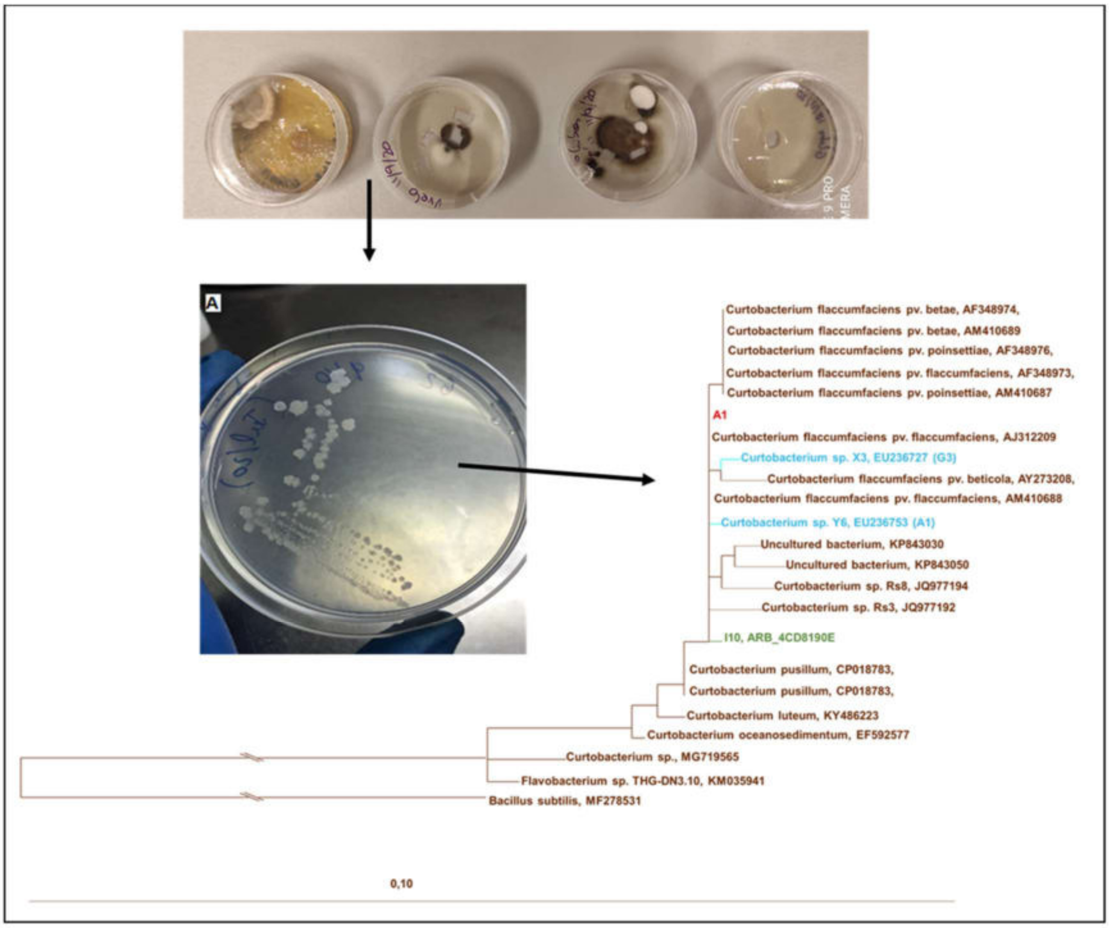

Figure RH1: Balloon sampling**:** Process of isolation and identification of cultures from the stratosphere. From the colonies obtained on the plates impacted in the stratosphere, colonies are isolated by extension seeding. Pure strains are identified by 16S rRNA gene sequencing and a phylogenetic tree is made to reliably establish their taxonomy.

RH2: Life as a geochemical control in the formation and evolution of key ore deposits (superMIN).

MINLIFE seeks to understand the role the role played by subsurface microorganisms in the genesis of secondary mineral deposits, using one of the best secondary mineral deposit examples: the supergene alteration zone of the Las Cruces volcanogenic massive sulphide located at the contact between a Paleozoic basement (Upper Devonian-Lower Carboniferous) and the Miocene sediments of the Cenozoic Miocene sediments of the Guadalquivir Basin, at about 250 m depth. From the microbiological point of view, the ecosystems found in the subsoil are mainly supported by methanogenic archaea and sulfate-reducing bacteria (Sulfate-producing sulfate-reducing bacteria (SRB). This assumes that methane production and sulfur reduction are the most important metabolic pathways in this ecosystem and the main responsible for the precipitation of sulfate complexed heavy metals. While this occurs in the anaerobic zones, in regions where oxygen is filtered, sulfur is oxidized to sulfate by sulfur-oxidizing bacteria (SOB) and methane oxidized by methanotrophic bacteria. Microscopic analysis, Secondary Ion Mass Spectrometry, as well as biomarker analyses has demonstrated the existence of a thriving microbial community, both living and fossilized, associated with the mineralization, providing direct and indirect evidence of the important biological control throughout the secondary mineralization. The fossil prokaryotes encountered were preserved due to a massive precipitation event that was probably promoted and indirectly accelerated by biological activity.

Figure RH2: TEM micrograph of bacilli found in the mineral cementation zone at Las Cruces mine.

RH3: Microbial ecosystem in the perennial ice from ice caves.

This project studies the composition of the microbial communities inhabiting the frozen caves on both slopes of the Pyrenean Mountain range. In addition, we intend to estimate the *in vivo* effect of climate change on their cellular machinery using proteomic techniques. These works are part of the ORCHESTRA project.

Figure RH3: Ice cave. A) Porche entrance. B) Sampling ice from seasonal ice formed during late winter/early spring. C) Location of the fossil ice. D) Sampling in the ice.

RH4: Study of microbial communities during ice melting in Antarctic glaciers.

When glacier surface ice melts during the austral summer, microbial communities proliferate and activate their metabolism. This metabolic activity plays a fundamental role in the cycling of carbon, nitrogen and other key elements. This work is part of the CSIC Interdisciplinary Thematic Platform (PTI) Polar zone Observatory (PTI-POLARCSIC) activities.

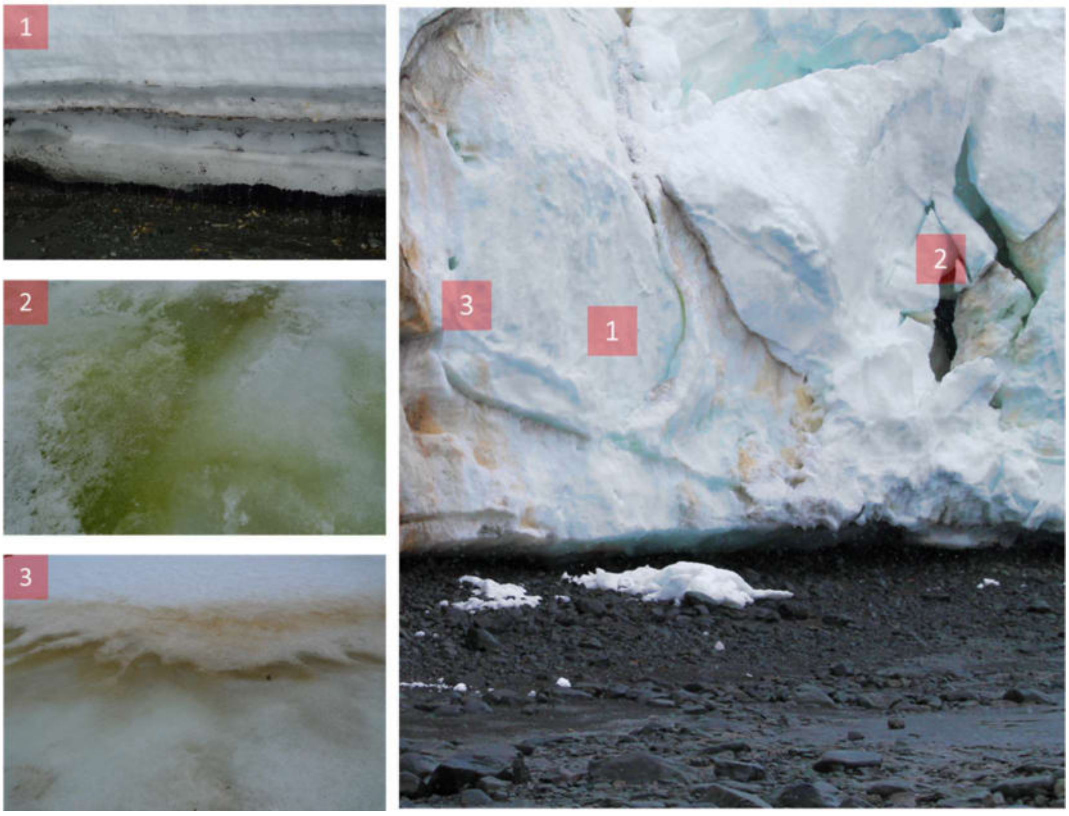

Figure RH4: Antarctic glacier. 1-3) Sampling points.

RH5: Biotechnological development of purple phototrophic bacteria.

This work aims to the biotechnological development of purple phototrophic bacteria (PPB) on resource recovery from waste sources, contributing to a circular bioeconomy. Resource recovery includes wastewater or organic waste, open or closed environments, in single or chain processes. The network associates fundamental-focused and applied-research groups, improving lab-scale technology optimization through mechanistic modeling. It benefits the technology transfer from applied-research groups to industry, considerably improving process design. These works are part of the PURPLEGAIN project.

Molecular Mechanisms of Biological Adaptation

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Carolina González de Figueras

Posdoctorals:

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Gloria López Morales

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Summary

Microorganisms that inhabit extreme environments (extremophiles), have developed complex molecular mechanisms that allow them to survive in these conditions. The research in this group is focused on the discovery and characterization of new molecular adaptation mechanisms from extremophiles, more

specifically those that thrive in hypersaline environments considered analogous to Mars and icy satellites such as Europa (Jupiter) and Enceladus (Saturn) (contribution to objectives O3.2 and O5.6 of CAB Strategic Plan). One important drawback is the fact that a major fraction of environmental microorganisms cannot be cultivated directly under laboratory conditions. To circumvent this limitation, this group is using culture independent techniques, such as metagenomic sequencing, functional metagenomics and metatranscriptomics, which allow access to the genetic information of all the microorganisms present in a certain environmental sample, easing the study of their adaptation strategies to extreme conditions. In addition, this group is also involved in the design of microorganisms and plants that are more resistant to the conditions of space or other planetary bodies, by expressing in them resistance genes isolated from extremophiles (contribution to O5.7 of the Strategic Plan).

Currently, this group is researching in: i) molecular mechanisms of adaptation to salt, perchlorate, UV radiation and day/night cycles in microorganisms that inhabit hypersaline environments; ii) gene transfer mechanisms in extreme halophilic microorganisms, such as the square archaea *Haloquadratum walsbyi*; and iii) expression of resistance genes to different abiotic stresses in the plants *Arabidopsis thaliana and Marchantia polymorpha* . The following research highlights exemplify the most relevant investigations and results in the group.

Research Highlights 2023:

RH1: tRNA queuosine modification may act as a quorum sensing signal, and controls NAU codon-enriched genes expression in both bacteria and eukaryotes

In previous studies of our laboratory, we have characterized the role of tRNA queuosine (Q) modification, which represents a new mechanism that regulates adhesion, biofilm formation and virulence generally in bacteria through the coordinated control of the expression of genes enriched in NAU codons (Q-genes). Due to biofilm formation and virulence are processes commonly regulated by quorum sensing (QS), we are studying Q or its precursors as QS signaling molecules. For that purpose, we have developed a fluorescent reporter strain (patent pending) for measuring the levels of Q or its precursors secreted by multiple bacterial strains. In addition, this strain has been used to identify indole as a novel inhibitor of tRNA Q-modification, which may open the door to the development of novel treatments against bacterial infections. Furthermore, we have addressed the role of Q in eukaryotes, and we report that Q also controls the expression of Q-genes in these organisms, similar to bacteria. Bioinformatics analysis revealed that Q regulates ubiquitination, phosphatidylinositol metabolism, splicing, DNA repair or cell cycle generally in eukaryotes, critical processes during carcinogenesis (Figure 1). Moreover, considering that eukaryotes obtain Q from its microbiome, we have observed that certain health defects of germ-free organisms could derive from impaired q supply, and we suggest that Q would represent a new molecule by which microbiome could affect host physiology through translational control of host Q-genes.

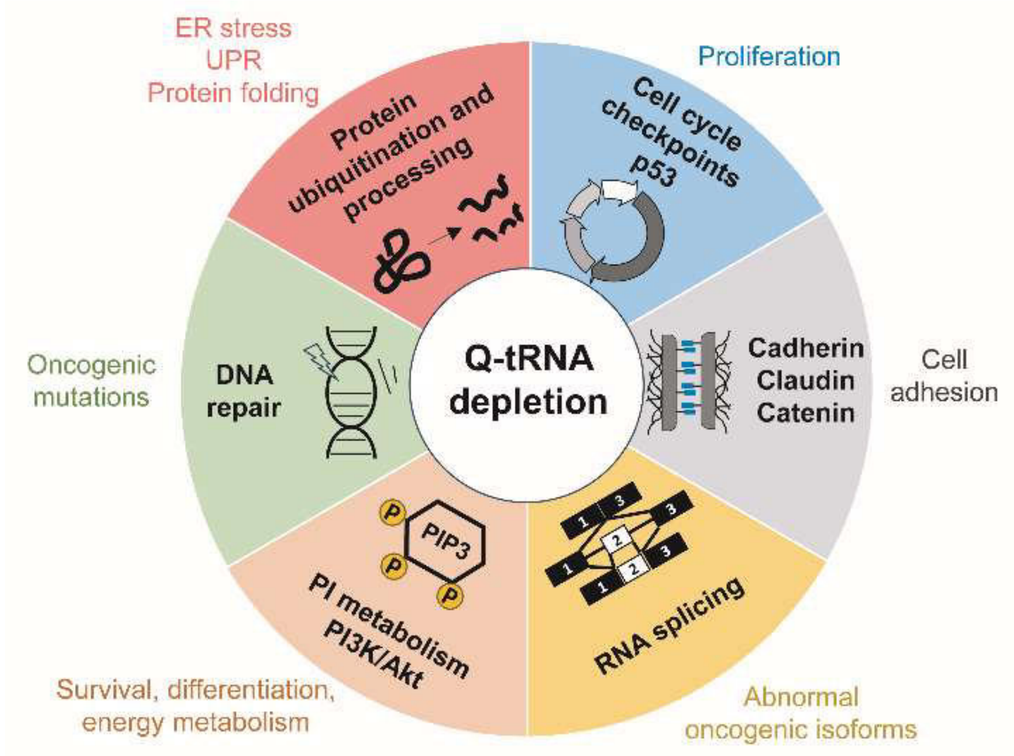

Figure RH1: Graphical scheme of the processes that may be dysregulated by Q-tRNAs depletion in human cancer cells due to alteration of Q-genes translation.

RH2: Archaeosine would regulate the adaptation to changes of salinity in extreme halophilic archaea possibly through the control of NAU codon-enriched genes expression

In a different project, we have studied the role of archaeosine, another tRNA modification found only in archaea. Previous results from our laboratory indicate a link between archaeosine and adaptation to salinity changes in the extreme halophilic archaea *Haloferax volcanii*, but we do not know the molecular mechanism underlying this phenomenon. Archaeosine shares a biosynthetic pathway with Q. As stated in RH1, Q increases the translational efficiency of NAU codon-enriched genes (Q-genes) in bacteria and eukaryotes. In archaea such as *H. volcanii*, we have also identified Q-genes, but how they can be translated correctly without Q is unknown. In this work, we hypothesized that archaeosine plays the same role as Q, but in archaea. We compared the proteomic profile of a wild-type strain with one overexpressing archaeosine biosynthesis genes, and observed that the induced proteins were encoded by genes with a higher frequency of NAU codons, and the opposite for the repressed ones (Figure 2). Moreover, *H. volcanii* Q-genes were mainly involved in glycosylation and organization of S-layer proteins, which are known to alter glycosylation patterns for improving tolerance towards changes in salinity. Therefore, archaeosine could replace Q in archaea in the task of regulating the translation of NAU codons and Q-genes.

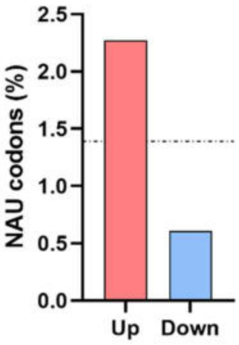

Figure RH2: Mean NAU codon frequency of the genes encoding for differentially expressed proteins in a strain of *H. volcanii* overexpressing archaeosine biosynthesis genes. Horizontal line represents the genome-wide frequency of NAU codons in *H. volcanii* genome

RH3: Introduction of the phytochelatin synthetase gene CaPCS2 in plants to analyze their resistance to different abiotic stresses

In collaboration with Silvia Díaz, PhD (Department of Genetics, Physiology and Microbiology (UCM)) and Ángeles Aguilera, PhD (CAB) we carried out a study on the resistance to different abiotic stresses conferred by the expression of the phytochelatin synthetase gene CaPCS2, from microalgae *Chlamydomonas acidophila* isolated from Río Tinto (Huelva, Spain), in *Escherichia coli* (DH5a). The resulting modified *E.coli* strain showed an increase in resistance to different stresses such as different heavy metals, arsenic, acidic pH, perchlorate, salt and UVB radiation (Díaz S, et al. 2022 IJERPH).

It was then decided to explore whether this gene could also increase resistance in plants. To do so, the CaPCS2 gene was introduced into two different model plant species. On the one hand, *Marchantia polymorpha*, which is a liverwort bryophyte of interest not only because it is a direct descendant of the first plants to colonise the Earth, but also because it is haploid, facilitating the analysis of transformed lines. On the other hand, *Arabidopsis thaliana*, which is one of the main model plants, with easy and fast growth. Once the transformed *Marchantia* plants were selected, their resistance to perchlorate was tested. Comparing WT plants with those containing the CaPCS2 gene in the presence of perchlorate, we obtained some quite encouraging preliminary results (Figure 3). Constructions in *Arabidopsis* grew more slowly because the different lines must reach homozygosity before resistance testing can be performe

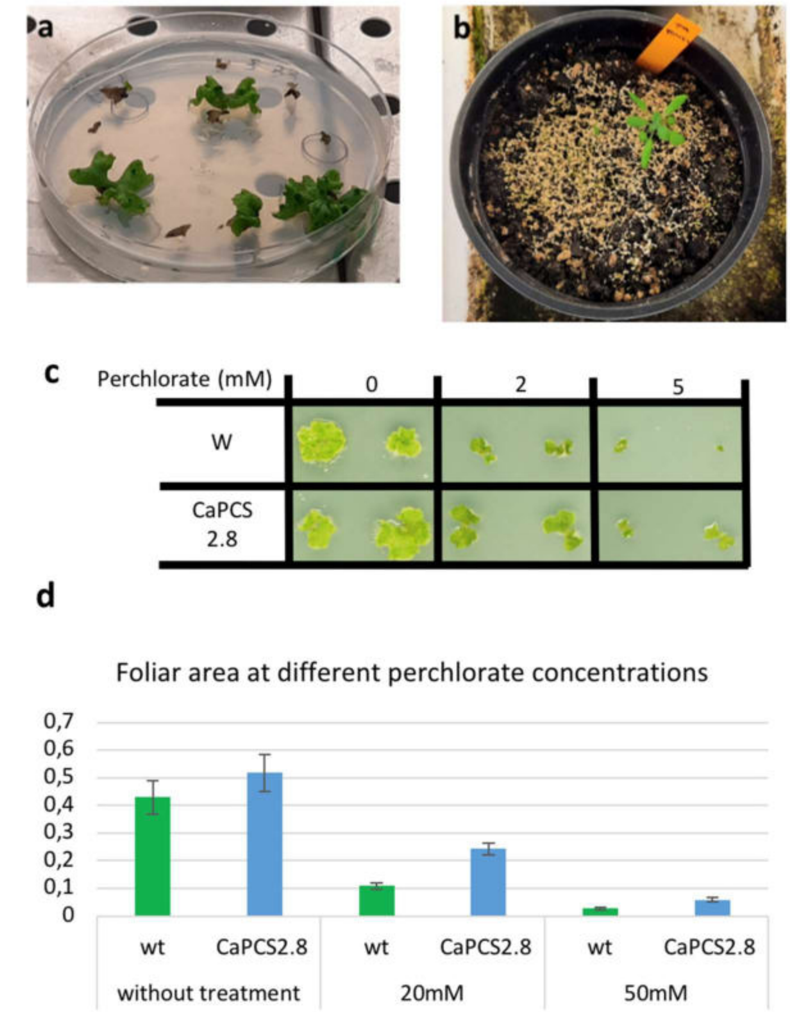

Figure RH3. Selection of plants transformed with gene CaPCS2, a) *Marchantia polymorpha* GB5 ½ medium with hygromycin and cefotaxine in petri dish b) *Arabidopsis thaliana* selection in vermiculita soil (1:1) with phosphinothricin or glufosinate ammonium, c) and d) Growth in GB5 1/2 medium with different amounts of perchlorate for 2 weeks (with controlled light and temperature).

RH4: Searching for UV resistance genes in biofilms from Salar de Atacama

Salar de Atacama (Chile) is characterized by being a hypersaline environment where thriving microorganisms have to endure high doses of UV radiation. These conditions cause harmful effects in those living organisms that are adapted by the production of protective molecules, such as pigments (Figure 4), effective DNA protection and repair enzymes, and other molecular strategies yet to be discovered. To study and discover novel genes involved in UV resistance in these microorganisms, we used functional metagenomics approach, a culture independent technique since most of those organisms cannot be cultured in the laboratory.

In this ongoing project, several biofilms were sampled from Aguas de Quelana in Salar de Atacama. The metagenomic DNA obtained from these samples was sequenced by PacBio technology to perform diversity studies and was also used to create metagenomics libraries in *E. coli* DH10B strain. After exposing one of the libraries to 5 mJ/cm^2 of UV (B) radiation, 100 resistance clones were selected for further UV experiments. Of them, five show higher UV resistance than the parental strain in drop assays. Plasmids from these clones were extracted, and they will be sequenced to determine the ORFs and coding genes. The results of this research will allow us to understand the resistance strategies hidden in these biological niches.

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Figure RH4: Microbial mats from Aguas de Quelana (Salar de Atacama). Samples present the distinctive colored pigmentation of organisms that inhabit these environments as a protective response of the extreme conditions to which they are exposed.

Biomolecules in Planetary Exploration

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Summary

A multidisciplinary group devoted to investigating the microbial metabolic potential and the preservation of molecular biomarkers (in space and time) in terrestrial analog environments to others found in different planetary bodies. The experimental approach is based on the study of the biological material and the information it provides in situ (field campaigns) and in the laboratory, its preservation and interaction with the physical environment, the identification of molecular biomarkers, and the development of methodologies and instrumentation for in-situ detection. The objective is to infer how life could be in other planets and to design methods and strategies for detecting molecular biomarkers in planetary exploration missions and in samples brought to Earth in the future. Over 2022 the group has contributed to objectives O4, O5, and O6 of CAB's Strategic Plan with investigations such as: Identifying molecular biomarkers (lipids and proteins) associated with ancient and current terrestrial analog environments and their similarities with other worlds (O4.1); deciphering the microbial diversity and adaptation to extreme physicochemical parameters in Antarctic nunataks, as potential analogues of cold and wet early Mars (O5.4), or the implementation of sensors for in situ molecular biomarker detection in planetary exploration and potential terrestrial applications (O6.4).

Research Highlights 2023

RH1: Searching for biomarkers in the early stages of life on Earth and in Mars analogs.

Peptides and proteins likely play a fundamental role in biology due to they were probably key molecules involved in the origin of life on Earth. We investigate the transition from abiotic to biotic chemistry of proteins through an immunological approach based on polyclonal antibodies, aiming to identify universal target biomolecules. For addressing this issue, first, we are focused on exploring i) hypothetical prebiotic primordial peptides; ii) searching peptide sequences reported in second structures in proteins with relevant functions, and iii) estuding ancestral proteins.

We have produced antibodies that recognize peptides reported to probably be involved in the origin of proteins in the first stages of the origin of life on Earth. For that purpose, we are developing experiments of prebiotic chemistry with the most abundant amino acids detected in meteorites and comets, that presumably were present in the early Earth. Under the prebiotic chemistry conditions hypothetically present in early Earth, these amino acids might have led to the synthesis of small peptides that could have been key in the formation of other relevant functional peptides, and therefore, could have probably contributed to early chemical evolution as well as the formation of the first proteins. Some peptides highly conserved in nature are part of important *motifs* and *domains* in proteins, which have a particular function by themselves (ej. zinc finger). We have produced antibodies that recognize different secondary structures in proteins, such as the P-loop or the Beta-propellers that can be considered universal targets. Finally, we have studied several ancestral proteins as possible targets for detecting and identifying peptide biomarkers in early Earth samples and Mars analog environments.

RH2: Detecting and Identifying Ancestral Peptide Biomarkers in Early Earth Analogue Environments

In this line of research, we have compared ancestral proteins and their modern counterparts, looking for conserved residues or short peptide sequences that can be used as potential universal biomarkers. To this end, we have used eight resurrected and reported ancestral proteins: three thioredoxins (LBCA, LPBCA, and LGPCA), three β-lactamases (PNCA, GNCA, GPBCA), a RuBisCO, and an Elongation Factor Tu and we produced polyclonal antibodies as targets for biomarker detection. Polyclonal antibodies raised against these relevant proteins were used in a fluorescent sandwich microarray immunoassay, the APChip, to test eleven natural samples corresponding to different environments (hydrothermal, arctic, and mediterranean) and different types (silica precipitates, biofilm, salt crust, sediment, and soil). Antibodies used in the APChip led to identifying the oldest thioredoxin and beta-lactamase proteins (reported from ca. 4 Ga) in samples form the hydrothermal environment. The identification of target peptides in both antibodies (anti-thioredoxin and anti-⍰-lactamase) by epitope mapping and inhibitory immunoassays showed that the two proteins share epitopes (Fig. 1). Metagenomic analysis from the El Tatio sinter mound sample confirmed the presence of some thioredoxin and β-lactamase encoding genes, primarily assigned to Actinobacteria. The results can facilitate the implementation of the LDCHip with new probes to identify common well-conserved molecular biomarkes as proof for life detection in early Earth and Mars analogs as well as for future planetary exploration missions. (Severino R., *et al.,* 2023).

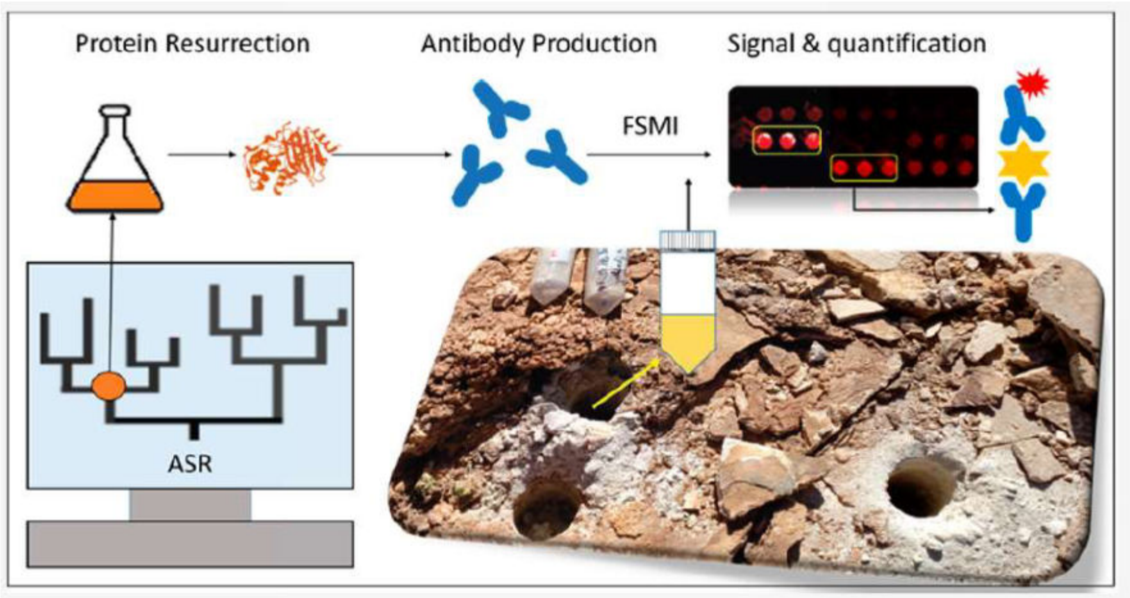

Figure RH2: An immunoanalytical approach for detecting ancestral-like and well evolutively conserved peptides in nature.

RH3. Microbial Biomarker Profiling with Signs of Life Detector-Life Detector Chip (SOLID-LDChip) During a Mars Drilling Simulation Campaign in the Hyperarid Core of the Atacama Desert

The study of extreme environments on Earth as terrestrial analogs of other planetary bodies is essential for studying the limits of life and for testing equipment and instrumentation devoted to in situ planetary exploration. The Atacama Desert (Chile) is one of the best terrestrial analogs of Mars. Therefore, Mars drilling simulation campaign was developed as part of the 2019 NASA Atacama Rover Astrobiology Drilling Studies (ARADS) project which aimed was to search for biomolecular evidence of life in the arid core of the Atacama Desert. The drilling was conducted using the rover KREX2, equipped with a drill and a robotic arm with a scoop, which collected samples down to 80 cm depth and delivered them to three instruments on board, particularly to SOLID-LDChip (Signs of Life Detector-Life Detector Chip). SOLID processed and analyzed three selected samples with LDChip for searching for molecular biomarkers (Fig. 2). The instrument operated remotely and autonomously, sent telemetry data and LDChip results to a science team at CAB. This remote operation demonstrated the high maturity of SOLID-LDChip as a powerful tool for remote in situ life detection and for future missions in the Solar System.

The data collected by SOLID-LDChip detected positive signals in all samples that were relatively more abundant in the middle layer (40–50 cm), which showed the presence of microbial markers from Proteobacteria, Acidobacteria, Bacteroidetes, Actinobacteria, Firmicutes, and Cyanobacteria as well as proteins involved in nitrogen metabolism (Fig. 2). These findings indicated a relatively complex microbial community with members capable of nitrogen fixation and denitrification, sulfur oxidation and reduction, or triggering oxidative stress responses. The findings were corroborated and complemented by a comprehensive analysis of the ‘‘returned samples’’ in the lab, which included DNA sequencing, metaproteomics, and a metabolic reconstruction of the sampled area (Moreno-Paz *et al.,* 2023).

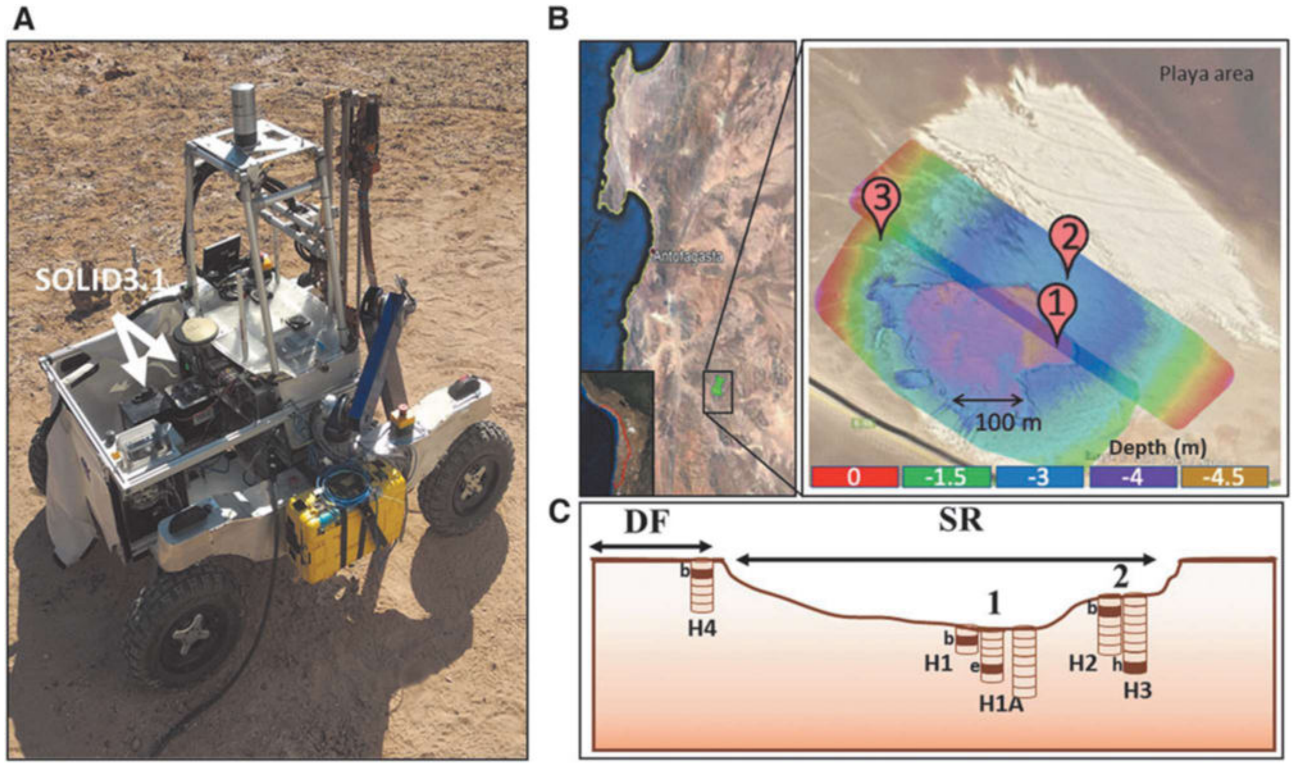

Figure RH3.1: The ARADS 2019 remote Mars drilling simulation campaign in the Atacama Desert. (A) SOLID3.1 instrument on the autonomous K-REX2 rover at the Playa area under study. (B) A Google Earth image of the Playa area showing the relative position of the Playa area in a schematic topography of the field. The color code represents the elevation model from drone imaging of the field area in meters from the desert pavement. Three sections were drilled in the Playa area, corresponding to SR sediments (SR1 and SR2) and DF (3) sediments, all located below a baseline reference in the desert pavement. (C) A cross-section view of the Playa area showing the relative position of perforations in the three sampling locations and the spatial position and proximity between them. Samples were taken at 10 cm intervals to perform the immunoprofile with LDChip for holes H1, H1A, H2, H3 and H4 as indicated in Section 2. A subset of five samples highlighted in dark brown and labeled with a letter to indicate the depth (b for 10–20 cm, e for 40–50 cm, h for 70–80 cm) were delivered to the instruments as part of the payload of the K-REX2 rover to perform remote analyses of biomarkers and returned to the lab for subsequent analyses. ARADS, Atacama Rover Astrobiology Drilling Studies; DF, desert floor; LDChip, Life Detector Chip; SOLID, Signs of Life Detector; SR, sulfate-rich.

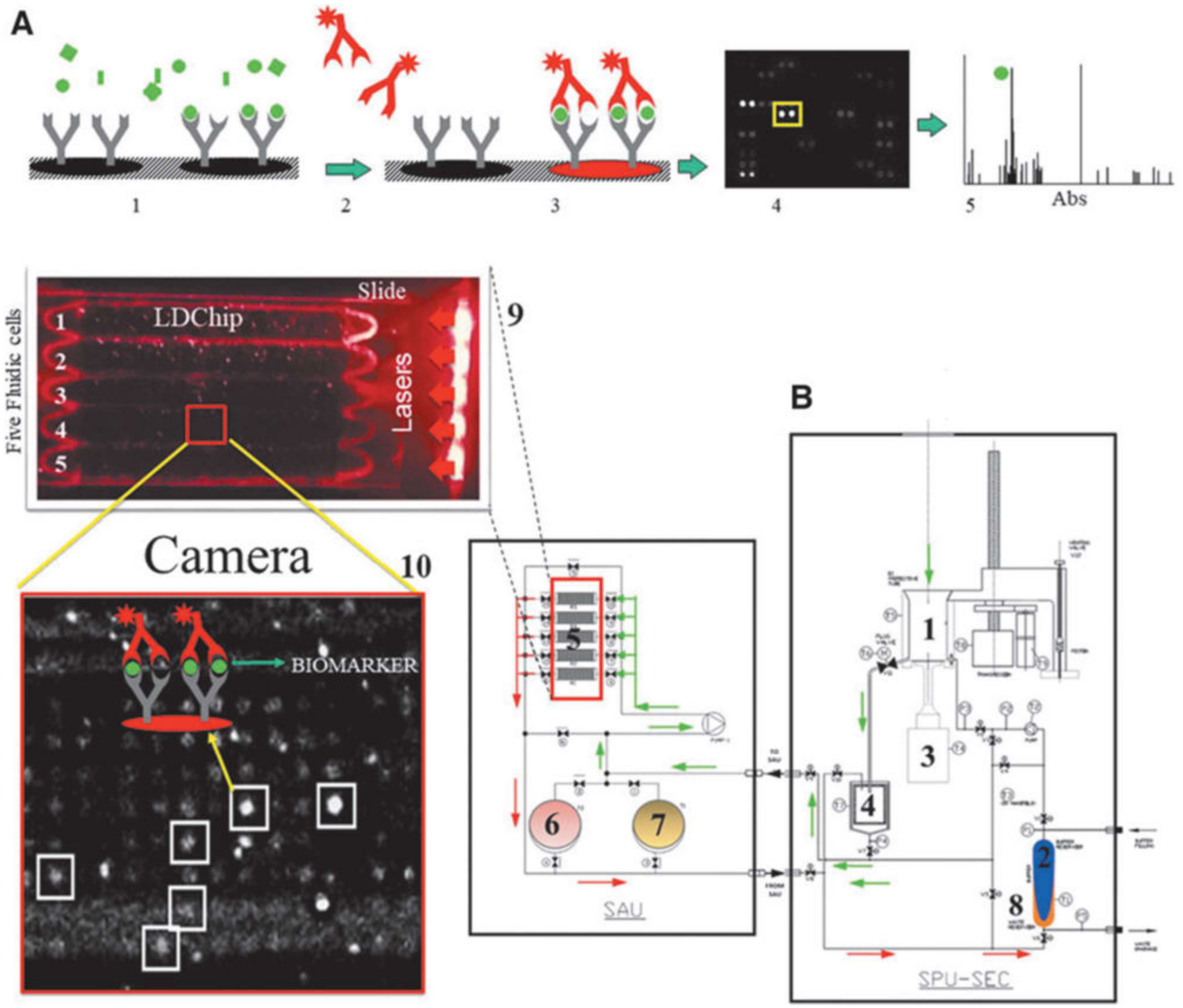

Figure RH3.2: SOLID3.1 remote operation and functional diagram. (A) Schematic process of the FSMI: (1) A multianalyte liquid extract is incubated with the antibody microarray (the LDChip); (2) capturing antibodies on the microarray specifically bind the target molecules and positive detections are developed with a fluorescently labeled mixture of the same printed antibodies (now acting as secondary detecting antibodies) that bind the target molecules (epitope) by different positions; (3) After washing out the fluorescent antibody solution, fluorescence only remains in those capturing antibody spots that bound molecules; (4) A laser beam excites the fluorochromes and a CMOS-based camera takes a pictures that shows fluorescent spots; (5) The image is analyzed, and the fluorescence intensity quantified and plotted. (B) Functional diagram of SOLID instrument. SOLID consists of two units: The SPU (right) and the SAU (left). (1) EC, receives the sample from the robotic arm; (2) buffer reservoir (blue) pumped to the EC; (3) sonicator; (4) 10 mm filter; (5) recirculation chamber microarray with five flow cells; (6) buffer supply reservoir; (7) labeled antibody reservoir; (8) waste (orange) reservoir separated by a membrane from fresh buffer reservoir. The signal readout module consisting of eight diode lasers coupled with two glass cylinders illuminate both ends of the slide exciting the labeled antibodies (9); and the fluorescent signal emitted by the fluorochromes is captured by a CMOS-based camera (10). Arrows represent the direction of the flowing liquid through the flow cells (green) and direction of the residual liquid to the waste reservoir (red). EC, extraction cell; FSMI, fluorescence sandwich microarray immunoassay; SAU, sample analysis unit; SPU, sample preparation unit.

RH4: Assessing siliceous sinter matrices for long-term preservation of lipid biomarkers in opaline sinter deposits analogous to Mars in El Tatio (Chile).

Subaerial hydrothermal systems are key for paleobiology and astrobiology, presenting conditions that may have supported early life on Earth and potential signs of life on ancient Mars. These systems host sinter deposits with high preservation potential, making them ideal for biosignature studies. However, understanding long-term taphonomy impacts on these biosignatures remains challenging. This study investigates how silicification affects lipid biomarkers, durable cell-membrane components, in hydrothermal sinter deposits up to ~3000 years old from El Tatio, a prominent Martian analog on Earth. Comparing fossil biomarkers with local biofilm lipids, we assess how silicification influences preservation. Despite geological alteration, preserved lipids retained a biologically sourced, depleted stable-carbon isotopic signature, crucial for astrobiology. This research estimates lipid degradation rates and preservation timeframes in El Tatio sinters. DNA sequencing and metaproteomics, while aiding paleobiology reconstruction, showed DNA and protein detection declined significantly beyond 5 cm depth. Lipids were the most resilient biomolecules, offering insights into taphonomy in hydrothermal deposits and informing the potential time window for detecting past life on Earth and possibly Mars.

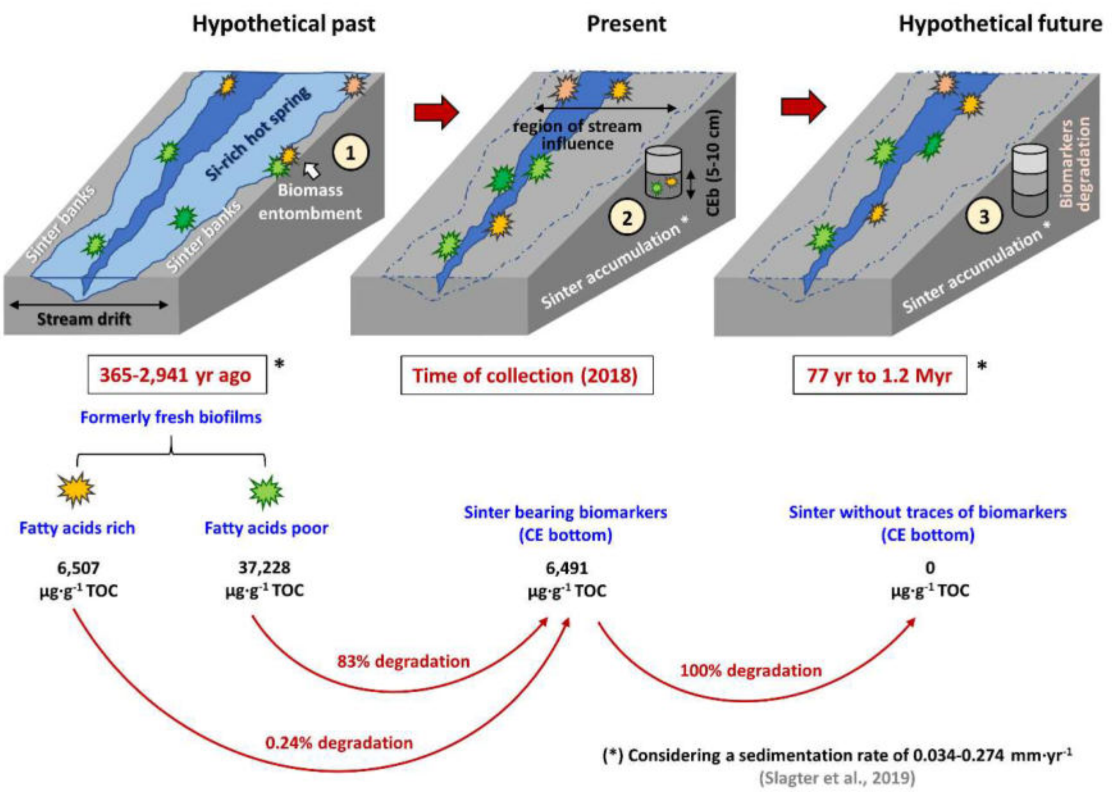

Figure RH4: Simplified model of preservation/alteration of lipid biomarkers (as n-fatty acids) trapped in silica sinter deposits from a hydrothermal stream in El Tatio (Atacama), in which banks silica sinter precipitates at a rate of 0.034 to 0.274 mm·yr−1 (Slagter et al., 2019) entombing hydrothermally associated biofilms. Based on this sedimentation rate, and a number of assumptions, the model hypothesizes that from 0.24 to 83 % of the initial n-fatty acids would have degraded in about 365–2941 years. Assuming a comparable degradation rate, sinter accumulation rate, and environmental conditions in the future, we estimate that the complete degradation of the remaining fatty acids would occur in 77 years to 1.2 million of years (Ma).

RH5: An overview of lipid biomarkers in terrestrial extreme environments with relevance for Mars exploration.

Lipid molecules are organic compounds crucial to biological cell membranes and are widespread in life on Earth, making them valuable biomarkers for life detection. Their ability to form stable membranes under extreme conditions allows lipids to serve as universal biomarkers, potentially useful for detecting life beyond Earth. Unlike nucleic acids or proteins, lipids retain unique information about their biological sources within their durable hydrocarbon structures, preserving this data over geological timescales. This attribute is essential in astrobiology, where the ancient geological timespans of planetary bodies require exceptionally stable biomarkers. This work reviews studies that use lipid biomarkers to examine paleoenvironmental and life-detection aspects in extreme Earth environments—such as hydrothermal, hyperarid, hypersaline, and highly acidic settings—that parallel Mars's past or present conditions. While some compounds could be abiotically formed, this review emphasizes biologically derived lipid biomarkers. Together with complementary methods like stable carbon isotope analysis, lipid biomarkers offer a powerful means to investigate Mars, providing insights into whether life currently exists or once existed on the Red Planet.

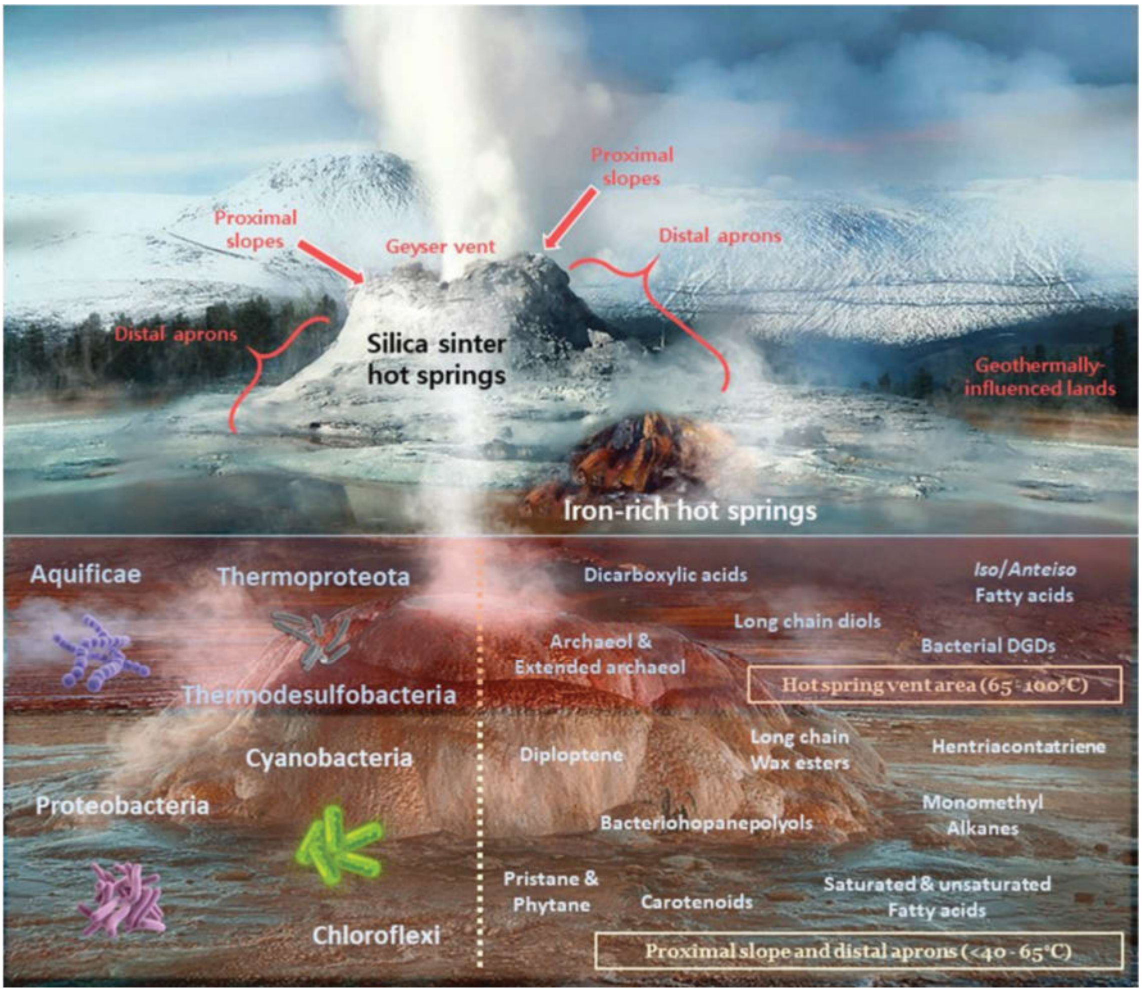

Figure RH5: Recreation of the lipid biomarker distribution in hydrothermal systems, where characteristic hot springs, fumaroles, and active geysers are represented. The upper section illustrates two main types of hot spring mounds based on mineralogy: silica sinter (white, erupting geyser) and iron-rich (smaller brown mound to the lower right). The lower section focuses on the lipid molecules (right side) and associated microbiological sources (left side) found in the hotter (65–100°C) regions of a geyser (vent and hot proximal slopes; reddish rectangle) and in the milder (<40–65°C) distal slopes and aprons (pale yellow rectangle).

PLANETOLOGY AND HABITABILITY

Department of

Heads of Department: Olga Prieto Ballesteros and Felipe Gómez Gómez

In this department we study the astrobiological aspects of the evolution and characterization of potential habitable environments in the Solar System and beyond, geomicrobiology of extreme environments, planetary geology and atmospheres or environmental and biogeochemical signatures.

Members of the department participate actively in the science teams of several planetary exploration missions such as NASA´s MSL and Mars 2020 (both in science and operations), ESA’s ExoMars, and JAXA’s MMX to martian moons. We have two scientists as members of the Planetary Protection Panel (PPP) of COSPAR (SPAce Research Committee), and one in the Mars Sample Return Scientific Management Group 2 (MSPG-2), an international panel created bya NASA-ESA that defines the plan to maximize the scientific return of the first samples to be brought to Earth from Mars by early 2030’s.

Two research groups:

- Planetary Geology and Atmospheres (PGA)
- Habitability and Extreme Environments (HEE)

Planetary Geology and Atmospheres

Figure 1. JUICE mission was launched to the Jupiter system in April 14th 2023. Credits ESA.

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Ana de Dios Cubillas

Students:

Víctor Cortés Ortega

David Pascual Cardeñoso

Agnese Caramanico

Summary

This group contributes to the objectives O3, O4, O5 and O6 of the Strategic plan by investigating the Solar system bodies:

- Participating in the science exploitation of space missions to Mars (e.g. ExoMars, Trace Gas Orbiter, Curiosity, and Perseverance, where a researcher acts as Returned Sample Scientists), its moons (MMX, where a group member is PI of RAX instrument), small bodies of the Solar System (DART, Hera), Mercury (Bepi-Colombo), and the Ocean Worlds of the Solar System (JUICE).

- Performing laboratory experiments and field work that resulted to the characterization of potential habitable environments of Mars and icy worlds, including the presence of biosignatures and the geological context.

- Modeling geological processes that affect the evolution of planetary environments, such as the formation of hydrological features, or impacts by remote sensing data interpretation and computer modeling.

- Advising in international panels such as the COSPAR Planetary Protection Panel and the ESA Expert Group for Ocean Worlds.

The following research highlights exemplify the most relevant investigations and results in the group.

Research Highlights 2023:

RH1: Concluding NASA- DART mission

Even though no known asteroids are expected to threaten Earth for at least the next hundred years, there are still gaps in our catalog of near-Earth asteroids that could cause regional devastation if they collide with Earth. Various strategies have been proposed to prevent such an event by deflecting or destroying an asteroid projected to collide with Earth. For relatively small asteroids (<100 km diameter), the best method is considered to be altering the asteroid’s trajectory through a controlled collision with a spacecraft launched for this purpose. A test of this technique was launched in 2021: NASA's Double Asteroid Redirection Test (DART). On September 27, 2022, DART executed a controlled head-on collision between the 600 kg spacecraft traveling at approximately 6 km/s and the 160-meter-wide asteroid Dimorphos, the smaller component in the rubble-pile-type binary asteroid system Didymos. This collision shortened Dimorphos’s orbital period by 32 minutes, which was considered a great success. It demonstrates that kinetic impact technique can be a viable method for planetary defense, given sufficient warning time—ideally several years to decades. During 2023, the CAB researchers participated in a number of international publications discussing the results from the DART experiment and related studies aiming at characterizing the properties of Dimorphos, as well as conducted experiments in support of the forthcoming ESA Hera mission. Hera is a follow-up to DART aiming to in more detail analyse the outcome of the DART impact on Dimorphos.

RH2: Uncovering DNA in Martian analogue conditions with ultra-low-level sequencing.

The study explores DNA sequencing at extremely low levels (picograms) using nanopore technology to detect potential signs of life on Martian analogue regolith and cultivating endolithic microorganisms in the absence of liquid water. The team successfully identified DNA in Earth-based microbial samples at just 2 picograms without DNA amplification, marking a major improvement in sensitivity over traditional methods, which often need higher quantities or amplification steps that can introduce contamination and error. Utilizing the MinION sequencer, researchers analyzed Martian soil analogues under varying water conditions, confirming microbial growth indicators in low-biomass environments and highlighting the impact of moisture on DNA detectability.

This advancement supports the Mars Sample Return mission's objectives to examine Martian samples for life and minimize cross-contamination risks. By proving that DNA can be sequenced accurately with minimal input, the findings pave the way for sensitive detection in planetary research and help refine protocols for sample contamination control in future space missions.

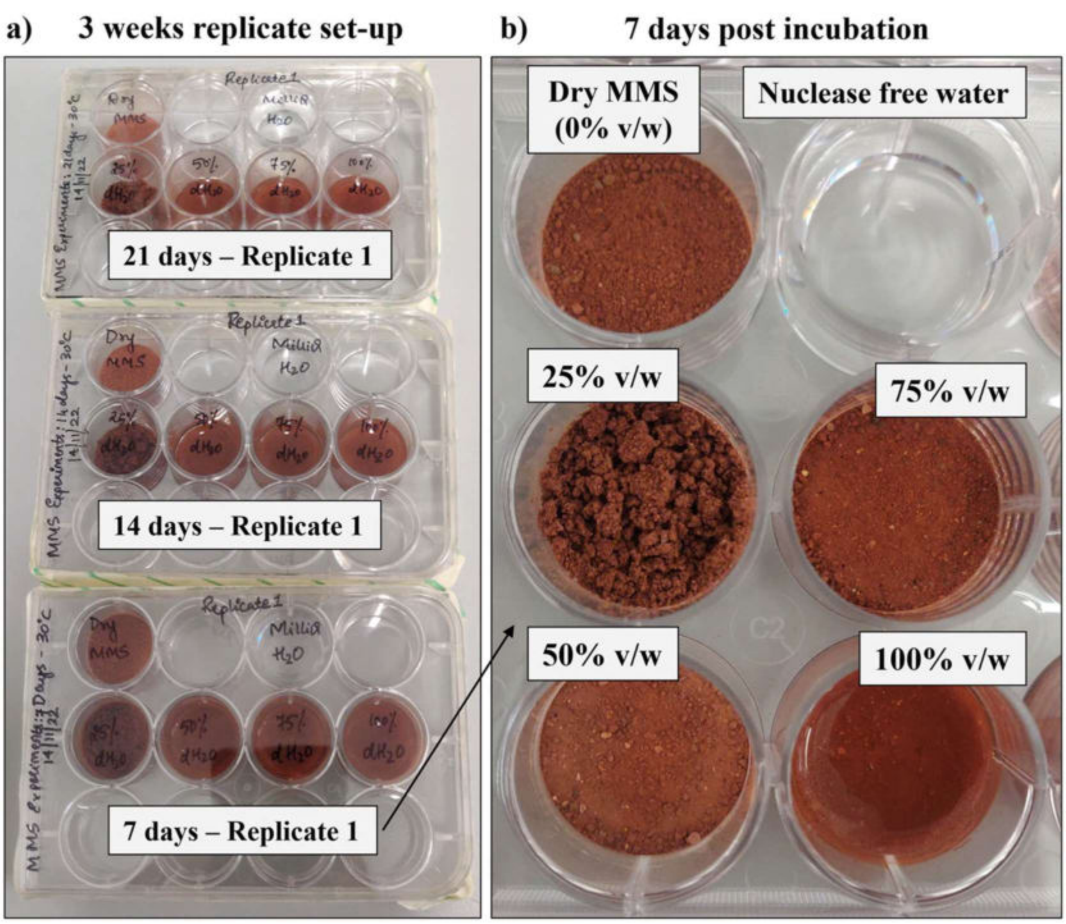

Figure RH2: *Incubation of Martian analogue regolith in the absence of liquid water for DNA extraction. Credit:* Basapathi Raghavendra, J., Zorzano, MP., Kumaresan, D. *et al.* DNA sequencing at the picogram level to investigate life on Mars and Earth. *Sci Rep* **13**, 15277 (2023). https://doi.org/10.1038/s41598-023-42170-6

RH3: The discovery of a possible 5 km impact structure in the Alhabia–Tabernas Basin, SE Spain

The Tabernas–Alhabia Basin is a structural depression situated in the province of Almería, southeastern Spain. The basin is filled with Neogene, Pliocene, and Pleistocene sediments resting discordantly on a Paleozoic metamorphic basement. During the marine Tortonian sedimentation, a bed of breccia (Gordo megabed) was formed. It consists of rotated sedimentary megablocks commonly capped and/or surrounded by a polymict breccia composed mainly of up to dm-sized clasts of the crystalline (schist) basement. Linked to the formation of the Gordo megabed is a ~5 km wide, rimmed depression with exposed breccias on the northern flank of the Sierra de Gádor Mountain. In the northern sector, this crater-like structure opens toward the Gordo megabed of the Tabernas Basin. In the southern sector, overturned strata transform outward into a putative ejecta layer. In the interior of the structure, there are occurrences of graded breccia and arenite superposed on a blocky, autochthonous breccia indicating an aquatic target setting.

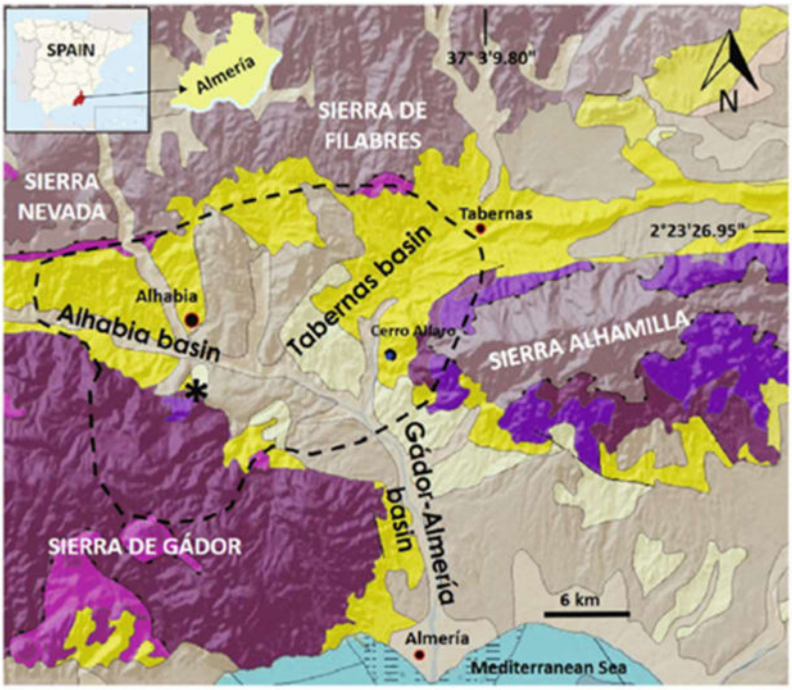

Figure RH3: Outline of the proposed impact structure. The black star indicates the location of the center of the structure. Stippled line indicates the extent of visual damage (e.g., Gordo megabed, brecciation). Figure modified from Sánchez Gómez et al (2023).

RH4: Discovery of new pathways of Fe (III) biomineralization in the surface microlayer of acid mine waters catalyzed by neustonic Fe (II)-oxidizing microorganisms

The floating mineral films found in stagnant acidic mine waters represent hotspots of biosphere/hydrosphere/atmosphere interactions of great value for the study of iron biogeochemistry in redox boundaries. However, many questions about their origin (biotic vs. abiotic), structure, mineralogy, physical stability and metal-retention capacity remained unanswered until now. Our study revealed the factors promoting their formation and clarified their composition. Fe(III) minerals dominate these formations, with mineralogy controlled by pH (jarosite at pH 2.0, schwertmannite at pH 2.5–3.5, ferrihydrite at pH > 6.0). Other minerals have also been identified in minor proportions, such as brushite or khademite. These mineral formations show an astounding capacity to concentrate many trace metals present in the underlying aqueous solutions. These floating mineral films are usually formed in Fe(II)-rich acidic waters, so their formation necessarily implies the oxidation of Fe(II) to Fe(III) phases. The potential involvement of Fe(II)-oxidizing microorganisms was investigated through 16S rRNA gene amplicon sequencing. The sequenced reads were dominated by Ferrovum, Acidithiobacillus and Leptospirillum, three well-known Fe(II)-oxidizing genera. These microorganisms are major contributors to the formation of the ferric mineral films, although other genera most likely also play a role in aspects such as Fe(III) sequestration, nucleation or mineral growth.

Figure RH4: Mineralized neustonic biofilms formed in highly acidic (pH 2.5) mine waters (Agrio river, Huelva)

RH5: Finding of the dielectrical properties of cryomagmas of ice moons.

The interpretation of the interior structure of icy moons from radar data requires knowing the dielectric properties of the materials. This includes cryogenic fluids that potentially are form the ocean and/or reservoirs inside the moons. In addition to salts, volatiles like ammonia or methanol are possible to be part of the aqueous systems. We studied the dielectric properties of solutions with ammonia (15 and 30 wt %) and methanol (15 and 70 wt %) at 1 bar, in a temperature range of 143 to 303 K and in a frequency range of 1 to 107 Hz. In this temperature interval different phases of the systems NH3-H2O and CH3OH-H2O are stable (from aqueous solutions to slurries formed by water ice or hydrated solids plus the liquid phase). Every phase assemblage has a particular electrical behavior and, consequently, it is possible to approach the contribution of different phases formed in each planetary layer dominated by a thermodynamical stability field. Experiments showed the strong effect of volatile concentration to the electrical properties values. The tested solutions have values of permittivity, conductivity, and wave attenuation sufficiently distinguishable to map the fluid regions and estimate the amount of volatile in the aqueous system.

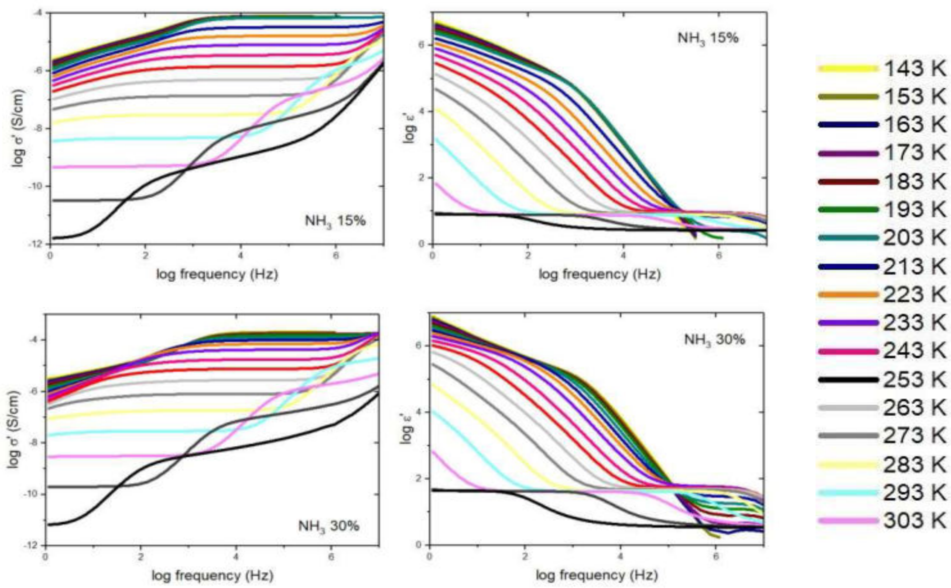

Figure RH5: Values of electrical conductivity and electrical permittivity of ammonia-water solution at several concentration and temperatures.

RH6: The discovery of special mechanisms for the ejecta emplacement from a cosmic impact at sea.

Very few terrestrial impact structures have preserved ejecta blankets. Generally, the strong erosion affecting Earth's surface, and the often frail character of the ejected material, hampers their preservation. Despite its high age of 458 million years, the Lockne impact structure is a rare exception due to a combination of a target with 500 m of seawater, 80 m of limestone, and 30 m of clay resting on a flat granitic basement, and rapid burial by subsequent marine sedimentation. The seawater was expelled outward, and the expanding crater reached deep into the basement. Limestone surrounding the basement crater was blasted off like a carpet. The impact structure obtained a "soup-plate" shape with a 7.5 km wide nested crater in the basement surrounded by a 3.5-km wide, shallow "brim". The more difficultly mobilized clay and exposed basement rock of the brim got bombarded by granitic ejecta forming a blanket. After less than 2 min, the 2 km high water wall collapsed and water rushed back to flood the dry impact crater, leaving only larger ejecta fragments and more consolidated parts of the ejecta blanket. This sequence of events only occurs in marine and stratified target settings, such as at Lockne.

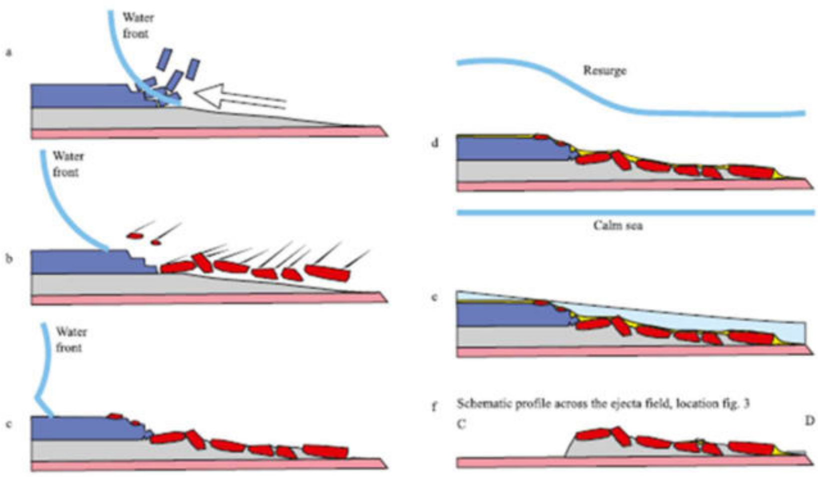

Figure RH6: Picture showing the suggested sequence for the formation of the ejecta field along a profile across the southern ejecta field of the Lockne impact structure , Sweden. Blue line shows the position of the water cavity. Figure modified from Sturkell et al. (2023).

In this study, the CAB researcher and collaborators provide an updated assessment for COSPAR on planetary protection requirements for Venus missions, given a surge in planned explorations of the planet. The authors conducted an extensive review of Venus's environmental conditions, focusing on the clouds, where temperatures are more moderate. However, their findings indicate that these clouds are far more hostile to life than previously thought, with extreme acidity and exceptionally low water activity—conditions vastly beyond the tolerance of any known terrestrial organisms.

This updated analysis supports COSPAR's classification of Venus missions as "Category II," which suggests only a minimal risk of Earth-based microbes contaminating Venus due to the planet's extreme environment. This guidance will support multiple upcoming missions, such as NASA's VERITAS and ESA's EnVision, by facilitating efficient planning without compromising scientific integrity, paving the way for responsible exploration and potentially transformative insights into Venus's history and atmospheric dynamics.

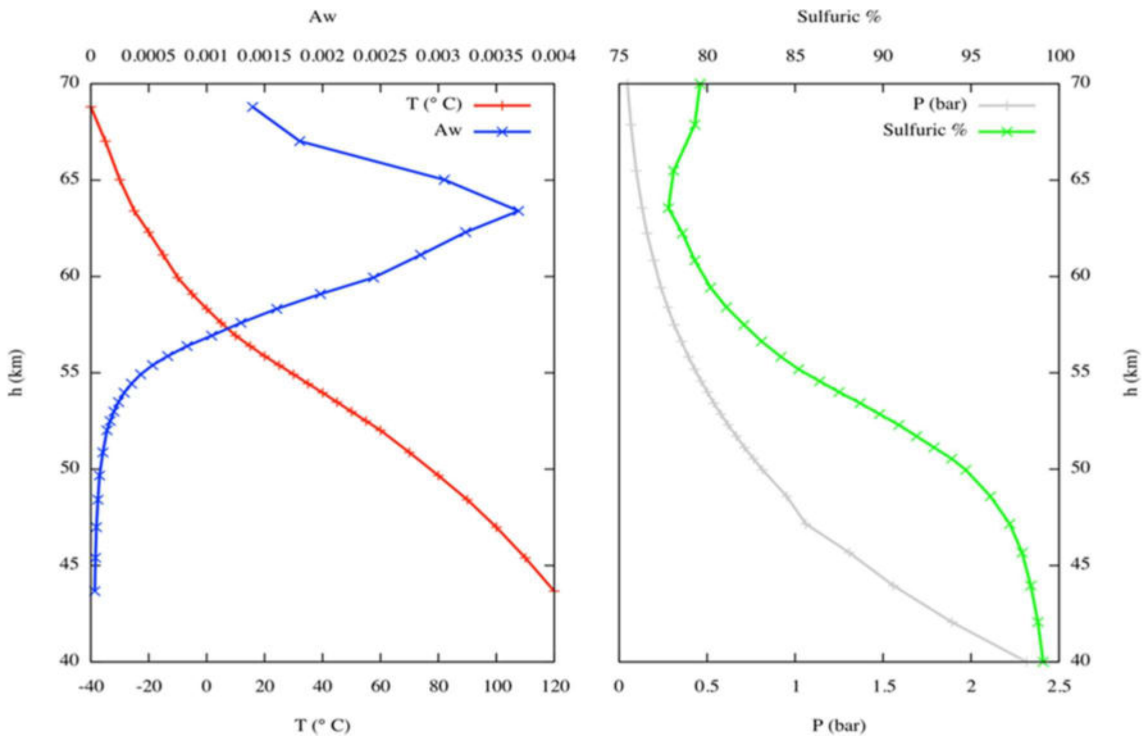

Figure RH7: Representative Venus vertical profile of the temperature (T), water activity (Aw), pressure (P) and sulfuric acid concentration in % from 40 to 70 km above the surface. The cloud layer has a temperature range below the upper-temperature limit for life on Earth, around 120–130 ◦C, and above the lower limit, with buffer, for temperature: -28 ◦C. However, the water activity remains Aw<0.004, which is well below the lower limit for life of 0.5. Image credit: Zorzano, María Paz, et al. 'The COSPAR Planetary Protection Requirements for Space Missions to Venus'. Life Sciences in Space Research, vol. 37, May 2023, pp. 18–24. DOI.org (Crossref), https://doi.org/10.1016/j.lssr.2023.02.001.

Extremophiles and Habitability

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Summary

This group contributes mainly to objective 3, 4 and 5 of our strategic plan, namely, to study the habitability of extreme environments on Earth as terrestrial analogues of other planetary settings, as well as to study the adaptability of life to extreme physico-chemical parameters. Additionally, this group explore the fingerprints that life can leave in the medium and its tight contact with mineral world. Members of the group are part of the REMS and MEDA instrument to characterize the Martian near ground atmosphere as part of the NASA`s MSL and Mars2020 missions. Over 2023 we have been working on the habitability and microbial metabolic traits of the polyextremophilic environment of several Earth analogues as Atacama Desert, Río Tinto and the Dallol area in Ethiopia, as well as daily participation in the REMS and MEDA operations and scientific discussions. The following research highlights exemplify the most relevant investigations and results in the group.

RH1: The identification of sensitivity limits of biosignature-detection instruments landed on Mars

European Research Council
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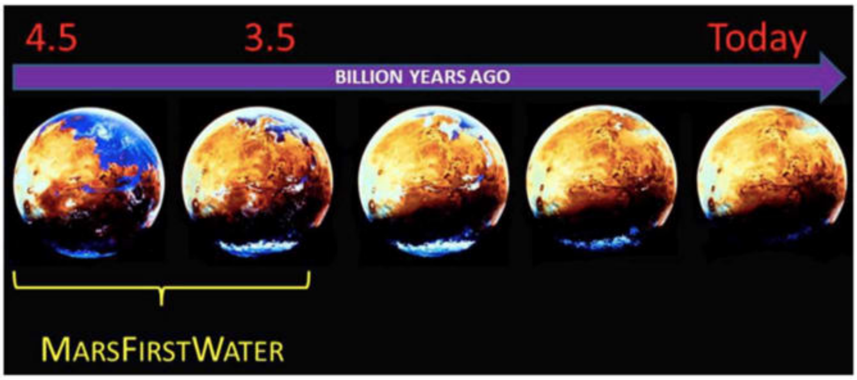


We found that current Mars mission instruments lack the essential sensitivity to identify life traces in Chilean desert samples that strongly resemble the martian area currently under study by NASA's Perseverance rover. If the biosignatures can't be detected in Earth samples, where both current and ancient life is clearly documented, we should not expect these instruments to be capable of detecting evidence of life from Mars' early history.

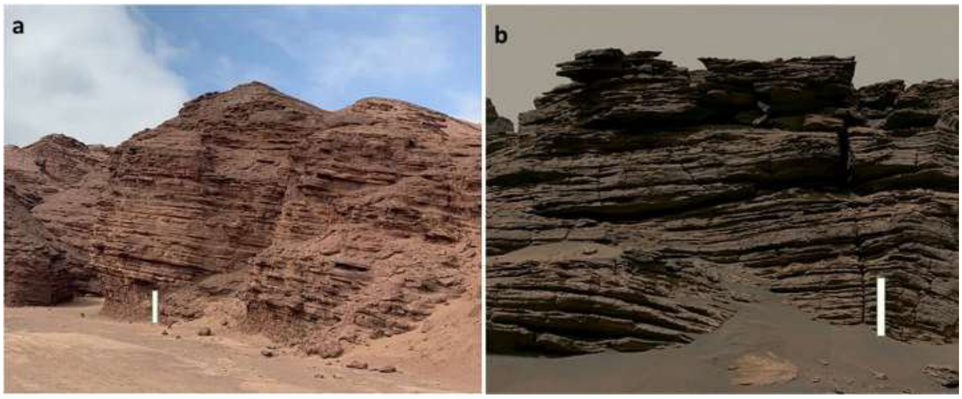


Figure RH1: The image on the left is the Red Stone Jurassic fossil delta of the Atacama Desert in northwestern Chile, a popular geological analog for Mars; the image on the right is of the Jezero Crater, on the surface of Mars.

RH2: The proposal and testing of the concept of “astrobiological time-analogs”

We have described the evolution of the microbial communities during desiccation of the Tirez endorheic hypersaline lagoon, proposing the concept of “astrobiological time-analogs”, referred to terrestrial analogs that can help understand environmental transitions and the related possible ecological successions on early Mars.

Figure RH2: Fieldwork and sampling in Tirez lagoon, central Spain, when the lagoon was still active (left) and after drought and desiccation, with only salt crusts remaining (right).

RH3: The identification of a metabolic pathway by which microorganisms can inhabit cold salty solutions

We have documented the survival of *Rhodococcus* sp. JG-3 in LB medium with up to 8 wt% magnesium perchlorate and down to −16 °C, identifying how the bacterium modulates the cell membrane permeability by changing the composition of fatty acids (FAs).

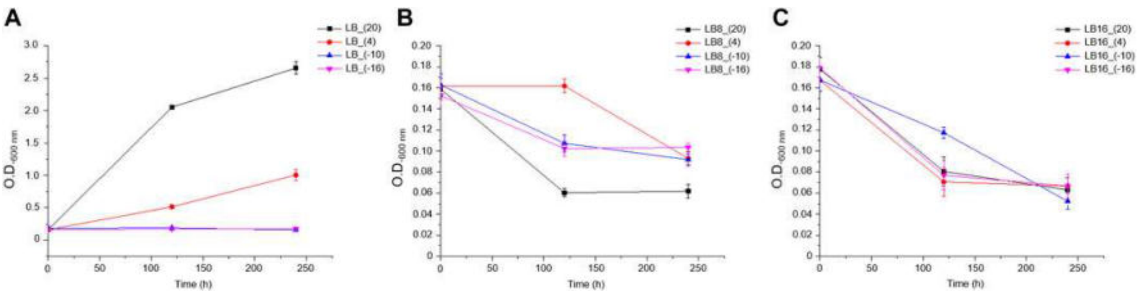


Figure RH3: *Rhodococcus* sp. JG-3 growth curves measured by optical density (600 nm) in **(A)** 0.5x LB medium, **(B)** 0.5x LB + 8% $Mg(ClO_4)_2$, and **(C)** 0.5x LB + 16% $Mg(ClO_4)_2$, at 20°C, 4°C, −10°C and −16°C.

RH4: The first discovery of subaerial microbialites in the Coastal Range of the Atacama Desert

In this report we characterized the biofilms that covered a unique cliff of the Coastal Range of the Atacama, showing that these are in fact the first discovery of subaerial microbialites on Earth. From these microbialites we isolated Hortae werneckii, a fungal species which by producing melanin, not only explains the dark color of these microbialites, but may also play the role of protecting the whole community from extreme UV radiation. A number of biosignatures not only confirmed sea spray as the main source of water, but also suggests that one place to consider for the search of evidences of life on Mars would be on the paleo-coastlines that surrounded vanished oceans such as that on Aeolis Dorsa.

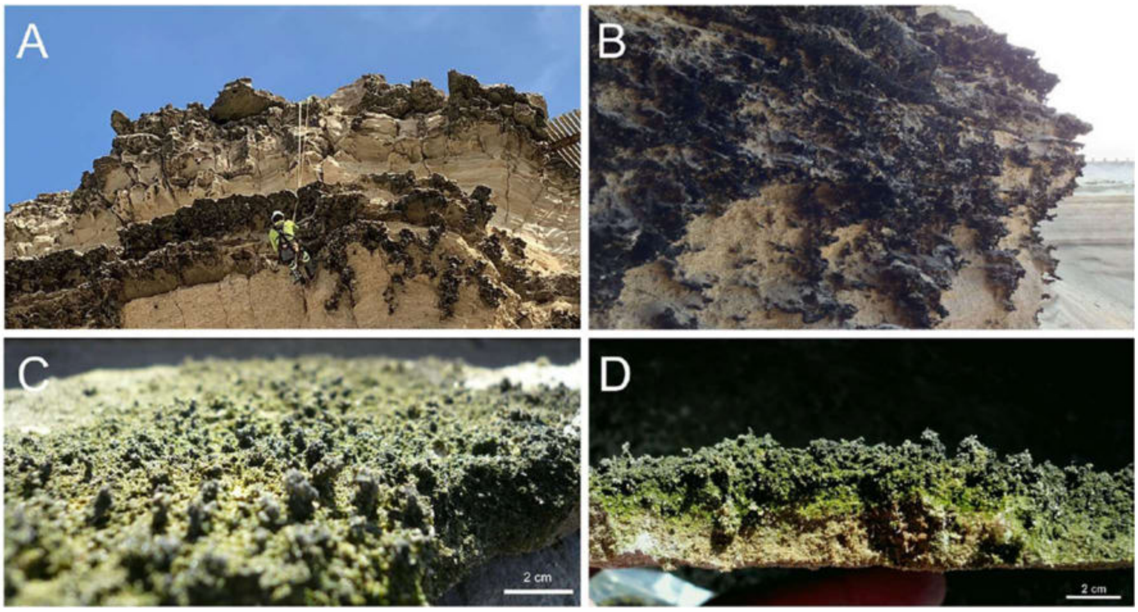


Figure RH4: Close up of the colonized sections of La Portada cliffs. (A) A view of a portion of the colonized section while sensors were being embedded. (B) A closer view of the colonized section. (C–D) Show details of the finger-like structures common in the colonized sections of the cliffs.

RH5: The discovery of living fossils in the continental slope of the Atacama Desert

Funded by the Schmidt Ocean Institute, in a successful oceanographic expedition that took place up to 4500m of depth below the Pacific Ocean in front of northern Chile, we proved our hypothesis that it contains very ancient deep-sea ecosystems, containing many species of living fossils. Although the study of the samples taken has just started, we are getting very interesting results on the type of macro and microorganisms that are able to live in such environment.

Figure RH5: A few of the animals discovered in the continental slope in front of the Atacama Desert.

RH6: In situ measurement and sampling of acidic alteration products at Río Tinto in support of the scientific activity of the Ma_MISS instrument

We describe the procedures and results of a geological field analysis campaign in the Río Tinto area. This geologically/biologically well-documented site with its rock/water/biology interaction represents an ideal open-air laboratory where to collect spectral data and samples useful for testing space instruments. During the field campaign, we collected a large set of VIS-NIR (0.35 – 2.5 μm) measurements using the ASD FieldSpec4 portable spectrometer both on biosignature-bearing rocks and on alteration hydrated products (sulfates, clays, oxides, etc.). Furthermore, as a comparison to the data collected in the field, we report the results of the micro-Raman analyses carried out in the laboratory on the collected mineral/rock samples. This work was conducted in the framework of the Mars Multispectral Imager for Subsurface Studies (Ma_MISS) instrument that is a miniaturized visible and near-infrared (VIS-NIR) spectrometer (0.5 – 2.3 μm) devoted to the Martian subsurface exploration and integrated into the drilling system of the ESA Rosalind Franklin rover mission. Ma_MISS will acquire spectral data on the Martian subsurface from the excavated borehole wall. The scientific results obtained by this campaign confirm that the Río Tinto site is important for enriching the scientific community's grasp on the Martian environment and for obtaining key information on the mineralogical and geochemical evolution of the Martian surface/subsurface. In addition, this work provides crucial preparation for the exploitation and interpretation of the scientific data that the Ma_MISS instrument will supply during the active phase of the mission. This activity is also useful for defining the priorities of the astrobiological objectives on the ground.

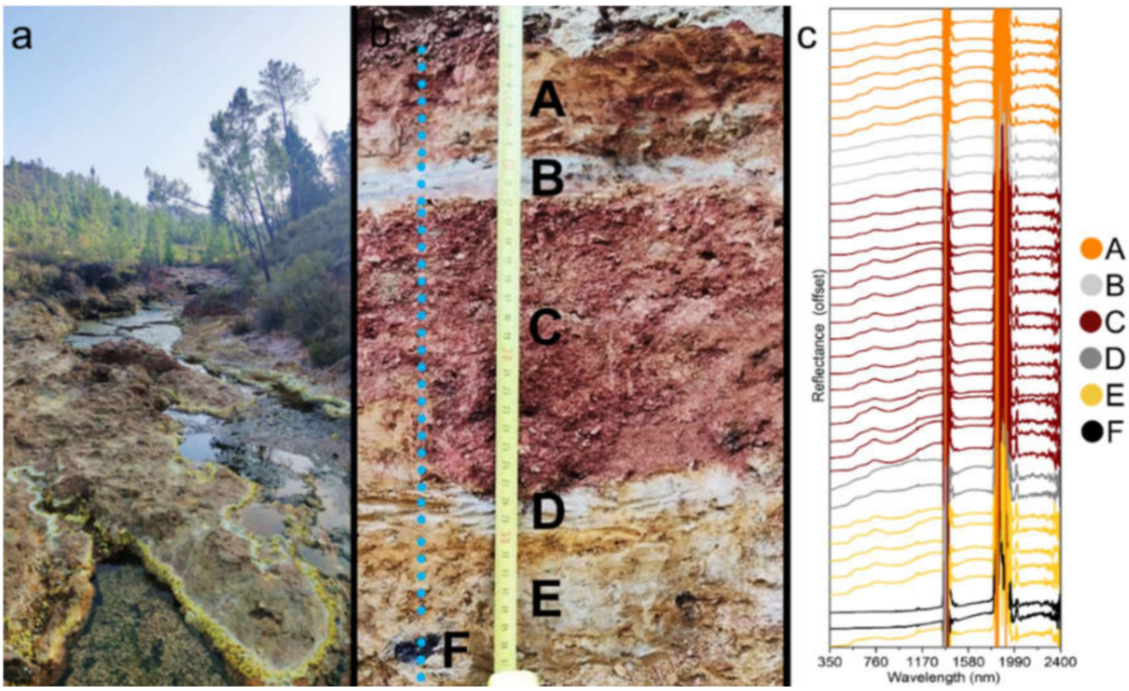


Figure RH6.1: a) sulfates; b) the exposed wall of the fluvial terrace, letters indicate the six different lithotypes and the blue spots the positions of all the collected spectral measurements; c) All the 37 acquired spectra stacked in the order of acquisitions, the colors indicate the different lithotypes.

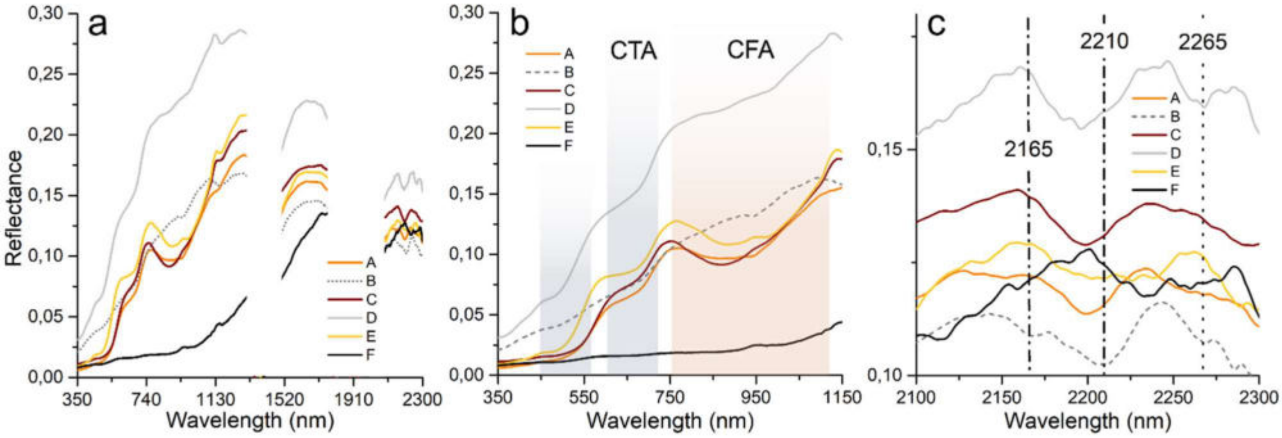


Figure RH6.2: a) VIS-NIR average spectra of every single lithotype; b) collected spectra in the range 350-1150 nm, the grey and the orange bands highlight the Charge Transfer Absorption (CTA) and the Cristal Field Absorption (CFA) respectively; c) 2100-2300 nm range, the vertical lines mark the position of the absorption of the layers B and D.

RH7: Shotgun Metagenomics-Guided Prediction Reveals the Metal Tolerance and Antibiotic Resistance of Microbes in Poly-Extreme Environments in the Danakil Depression, Afar Region

The occurrence and spread of antibiotic resistance genes (ARGs) in environmental microorganisms, particularly in poly-extremophilic bacteria, remain underexplored and have received limited attention. This study aims to investigate the prevalence of ARGs and metal resistance genes (MRGs) in shotgun metagenome sequences obtained from water and salt crust samples collected from Lake Afdera and the Assale salt plain in the Danakil Depression, northern Ethiopia. Potential ARGs were characterized by the comprehensive antibiotic research database (CARD), while MRGs were identified by using BacMetScan V.1.0. A total of 81 ARGs and 39 MRGs were identified at the sampling sites. We found a copA resistance gene for copper and the -lactam encoding resistance genes were the most abundant the MRG and ARG in the study area. The abundance of MRGs is positively correlated with mercury (Hg) concentration, highlighting the importance of Hg in the selection of MRGs. Significant correlations also exist between heavy metals, Zn and Cd, and ARGs, which suggests that MRGs and ARGs can be co-selected in the environment contaminated by heavy metals. A network analysis revealed that MRGs formed a complex network with ARGs, primarily associated with -lactams, aminoglycosides, and tetracyclines. This suggests potential co-selection mechanisms, posing concerns for both public health and ecological balance.

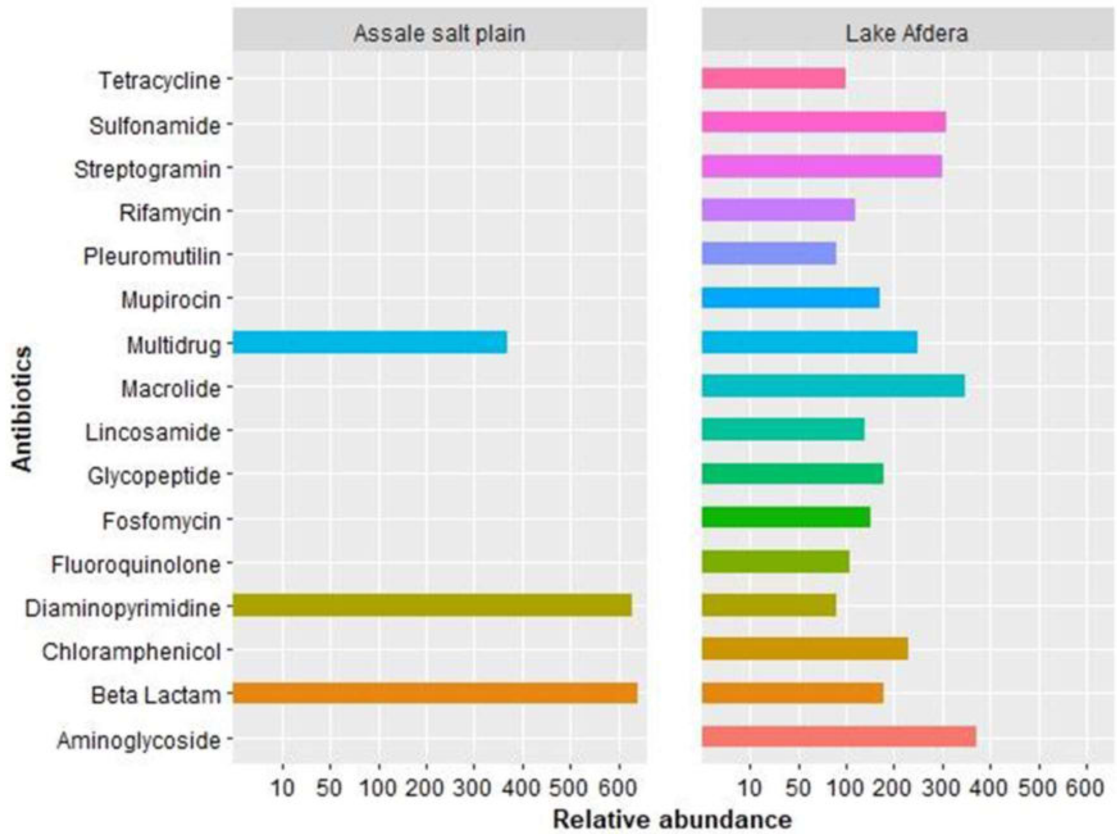


Figure RH7: The abundance of antibiotic resistance genes (ARGs) in Lake Afdera and the Assale salt plain predicted using CARD, and a resistant gene classification was conducted based on the Clusters of Orthologous Genes (COG) classification.

RH8: Samples Collected from the Floor of Jezero Crater with the Mars 2020 Perseverance Rover

The collection of samples from Mars for future return to Earth has been a high priority of the international planetary science community for decades. Here we describe the first samples collected by the Perseverance rover within Jezero crater, Mars. The sampled rocks represent the diversity of units exposed across the crater floor, from the oldest outcrops that comprise the Seitah formation to the potentially youngest rocks of the Maaz formation that spreads across much of the crater floor and includes heavily cratered terrains. Surface investigations using cameras and analytical instruments reveal landscape-to-microscopic morphological, textural, mineralogical, and geochemical evidence for igneous lithologies, some possibly emplaced as lava flows. The rocks contain recognizable major rock forming igneous minerals such as pyroxene, olivine, and feldspar, accessory minerals including oxides and phosphates, and also exhibit evidence for various degrees of aqueous alteration in the form of water soluble-salts, carbonate minerals, and iron silicates. The compositions and ages of these variably altered igneous rocks determined after sample return are expected to reveal the geophysical and geochemical nature of the planet’s interior at the time of emplacement, characterize martian magmatism, and place timing constraints on geologic processes, both in Jezero crater and more widely on Mars. Petrographic observations and geochemical analyses coupled with geochronology of secondary minerals can also reveal the timing of aqueous activity as well as constrain the chemical and physical conditions dominating in the environments in which these minerals precipitated and the nature of any organic compounds preserved in association with these phases. Returned samples from these units will be indispensable for determining the crater chronology of Mars and global evolution of the planet’s interior, for understanding the processes that formed Jezero floor units and constraining the duration of aqueous activity in Jezero crater, past habitability, and organic cycling.

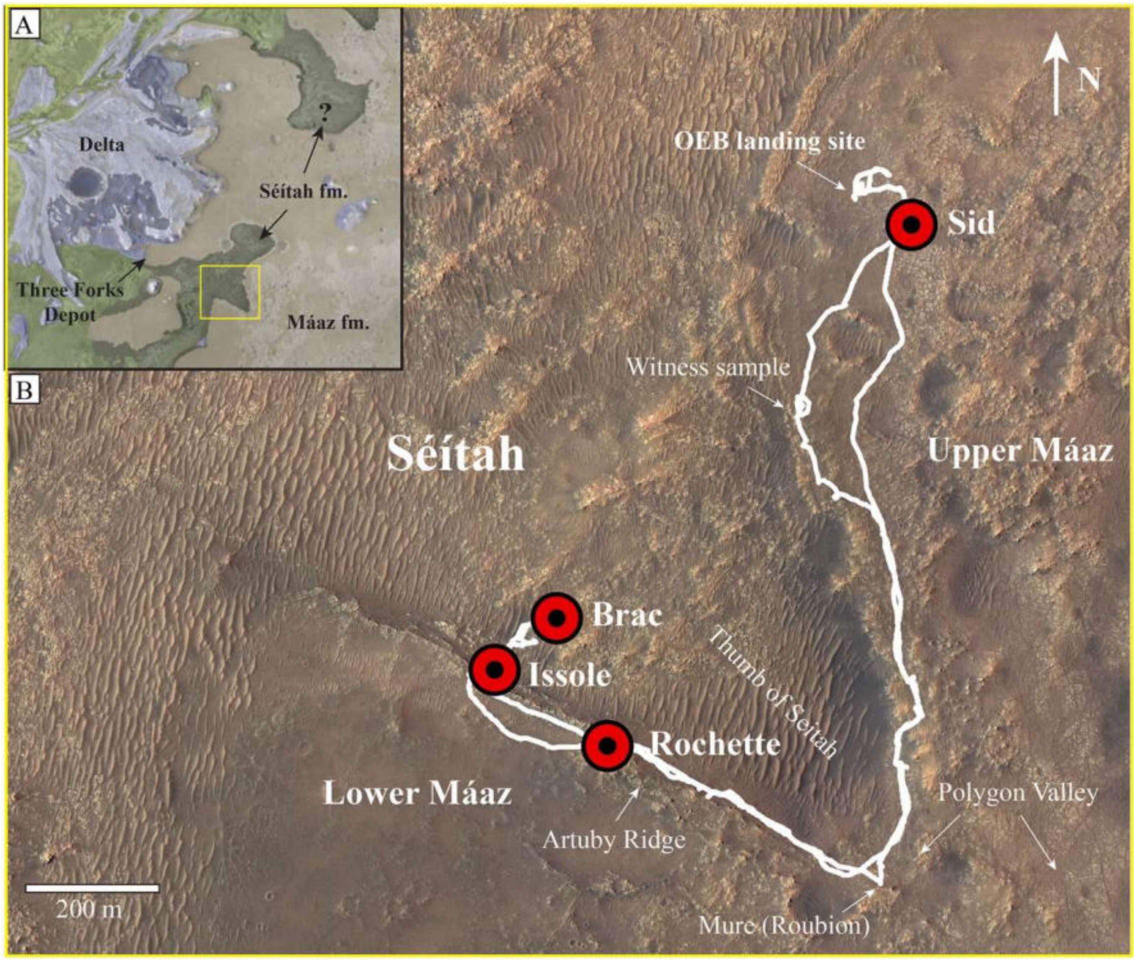
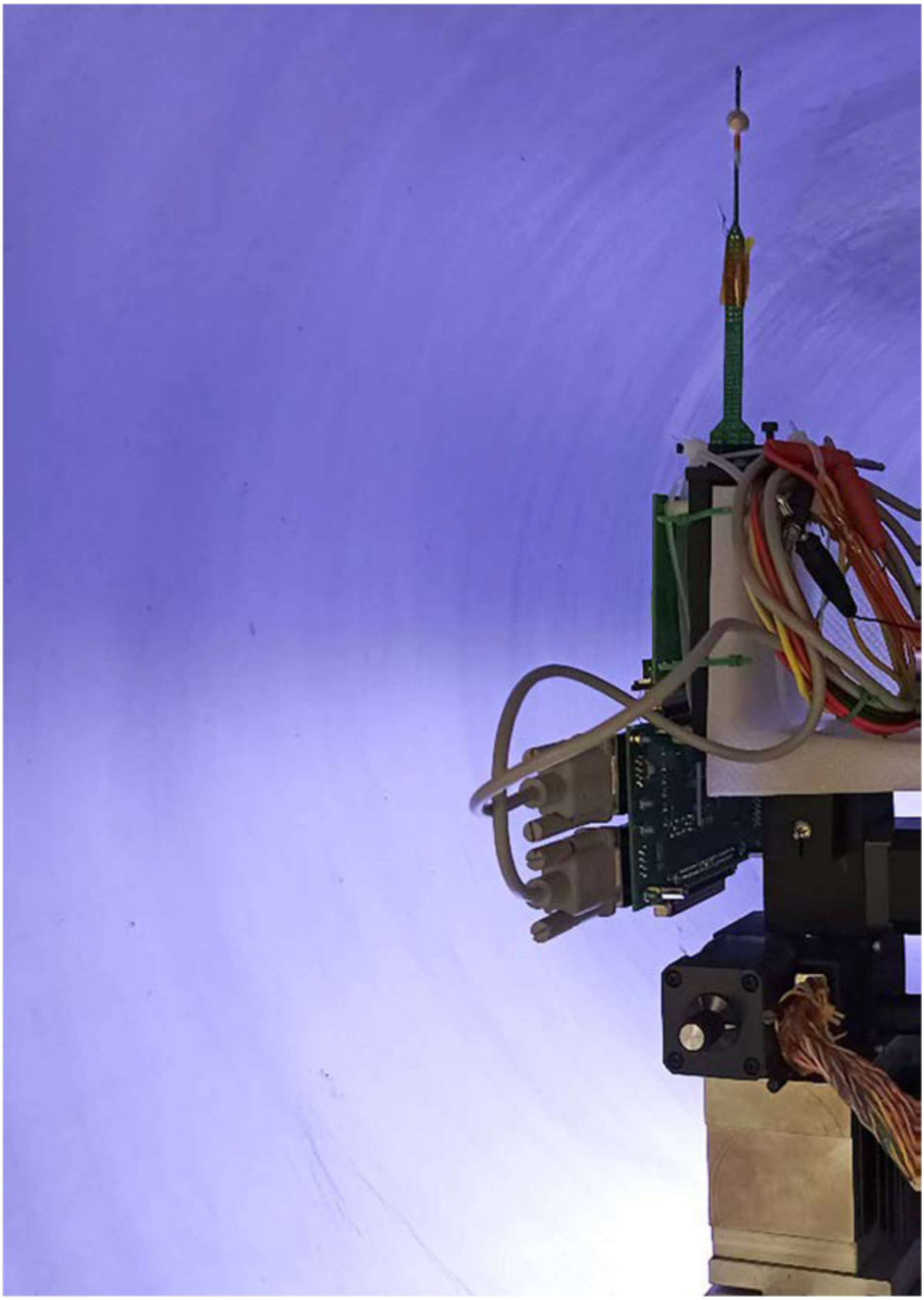


Figure RH8: Crater Floor Science Campaign area explored by the Perseverance rover: (a) Inset shows western edge of Jezero Crater, location of Three Forks sample depot, and explored region in yellow box. (b) High Resolution Imaging Science Experiment image shows the location of outcrop sample targets and rover path. Octavia E. Butler landing site, first witness sample location, and prominent crater floor features are labeled.

Instrumentation

Department of



Head of Department: Eduardo Sebastián Martínez

The Advanced Instrumentation Department devotes its research activity to the development of space instrumentation technologies for planetary and astrophysical exploration, as well as to the development of simulation chambers for planetary environments. All technological developments results from a multi and transdisciplinary relationship between the members of the Instrumentation Department and the rest of the Center's scientists. The Department has different infrastructures for planetary simulation, and to scientifically and technologically support the researchers of the group.

The Advanced Instrumentation Department is organized into one Research Group:

- Space Instrumentation

Figure: Cover of Nature Geoscience journal with images from MEDA's SkyCam camera, on the occasion of the publication of the article *The diverse meteorology of Jezero crater over the first 250 sols of Perseverance on Mars* by the MEDA team.

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Summary

Experimentation and simulation play a fundamental role in the accomplishment of objectives of the Centro de Astrobiología. In many cases, experiments are carried out in the laboratory, in others during field campaigns by studying natural processes, and in other cases in space, either by remote observation or by in situ analysis and measurements on the surface of planetary bodies. This group covers all the technological

aspects of these developments, from the conception of prototypes and instruments, the design and supervision of the industry specialized in the manufacture of flight models, to the execution of testing campaigns for the validation and maturation of the instrumentation and technologies, either in simulation chambers or in representative environments (the so-called terrestrial analogs). Also, in the scientific field, it carries out the exploitation of the data, through analysis, hypothetization, modeling, and validation of results, as far as the study of the environment of other planets is concerned.

The group thus contributes to objectives Ob3.2, Ob3.5, Ob4.2, Ob6.3, Ob6.5, and Ob6.6 of the Center Strategic Plan by studying the habitability of subsurface of other planetary environments and the effect of extreme physicochemical parameters in the laboratory. It also addresses the understanding of past and present Martian habitability through the dynamics of the Martian atmosphere. The group is also leading the development of environmental sensors for in-situ planetary atmospheric characterization and habitability assessment and is contributing to the definition of the future ESA and NASA missions with Astrobiological objectives, including environmental sensors. Finally, the group is working on the development of state-of-the-art superconducting detectors for astronomical and quantum applications.

Research Highlights 2023:

RH1: Operation of REMS and MEDA instruments and development of new instrumentation for the study of planetary atmospheres.

In the year 2023, the Space Instrumentation group led the operation of two space instruments dedicated to the environmental characterization of the Martian atmosphere and the study of the physical properties of its dust: REMS (Rover Environmental Monitoring Station) for NASA's Curiosity rover and MEDA (Mars Environmental Dynamics Analyzer) for NASA's *Perseverance* rover.

These instruments have contributed to consolidating Spain as an international reference in the field of Martian atmospheric characterization. They have combined advances in the frontier of scientific and technological knowledge within our country, uniting and harmonizing a significant part of the scientific and technological community interested in the Martian atmosphere, in a transversal way to different NASA missions.

In these projects, the group at CAB collaborates with national and international partners as the Departamento de Cargas Útiles at the Instituto Nacional de Técnica Aeroespacial, CRISA Airbus Defense and Space, AVS Added Value Solutions, ALTER Technology, the University of the Basque Country, the Polytechnic University of Catalonia, the Rocasolano Physics-Chemistry Institute (CSIC) and the University of Alcalá, as well as the Finnish Meteorological Institute, the Jet Propulsion Laboratory, the Lunar and Planetary Institute, Aeolis Research, the Space Science Institute, NASA Goddard Space Flight Center, Carnegie Institution, and the John Hopkins APL as international partners.

The MEDA environmental station landed at Jezero crater on 18 February 2021. It was conceived as a suit of sensors that record: relative humidity (Relative Humidity Sensor - HS), air temperature (Air Temperature Sensor - ATS), net balance of IR radiation (Thermal IR Sensor - TIRS), speed and direction of the Martian wind (Wind Sensors - WS), radiation and properties of the suspended aerosols (Radiation and Dust Sensor - RDS), and atmospheric pressure (Pressure Sensor - PS).

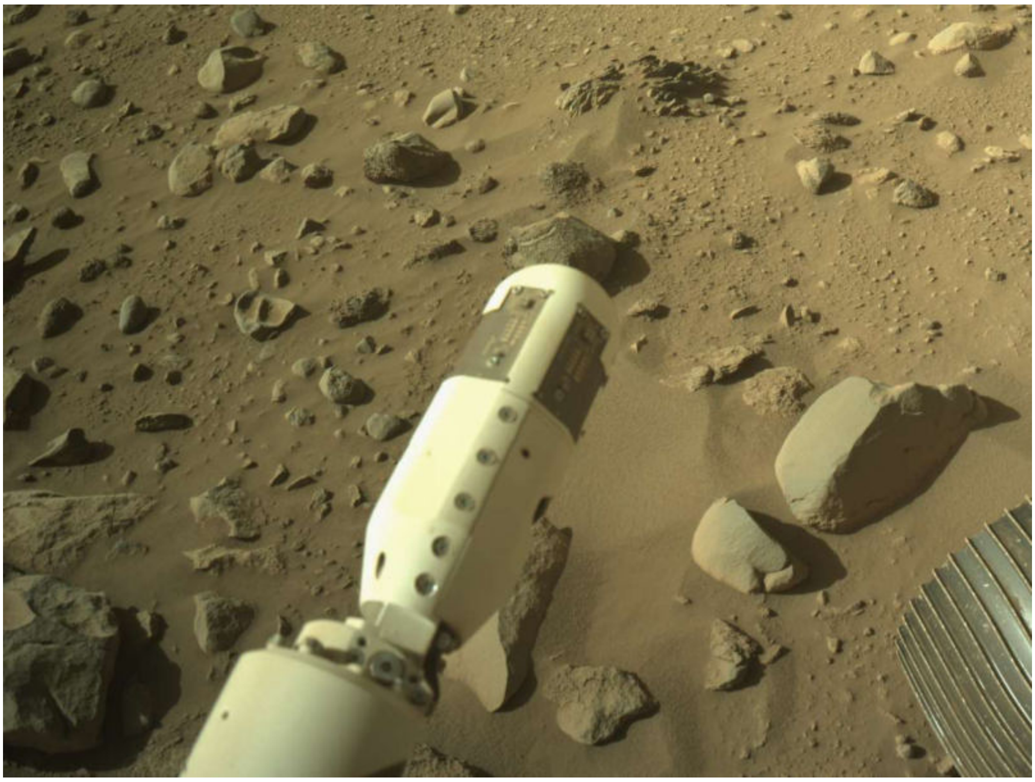


Figure RH1.1: MEDA WS detail photograph taken by rover Right Navigation Camera (Navcam) during Martian operations, image taken on Dec. 12, 2023, the 999th Martian day of the mission.

Throughout 2023, as part of the mission's phase E activities, both the engineering and the scientific teams of the project have led the instrument operation tasks, in close collaboration with NASA and JPL personnel, and the rest of the mission. This activity enables the retrieval of scientific data from the surface of Mars. MEDA has been running every day of the year except for 22 days. This implies that more than 16 million measurements were made, equivalent to 12 Martian hours of measurement per day, and 1023 images have been taken with SkyCam. Throughout the year, the instrument has been operated 5 days a week, and scientific data have been delivered to the PDS (Planetary Data System) on three occasions, making them available to the international scientific community.

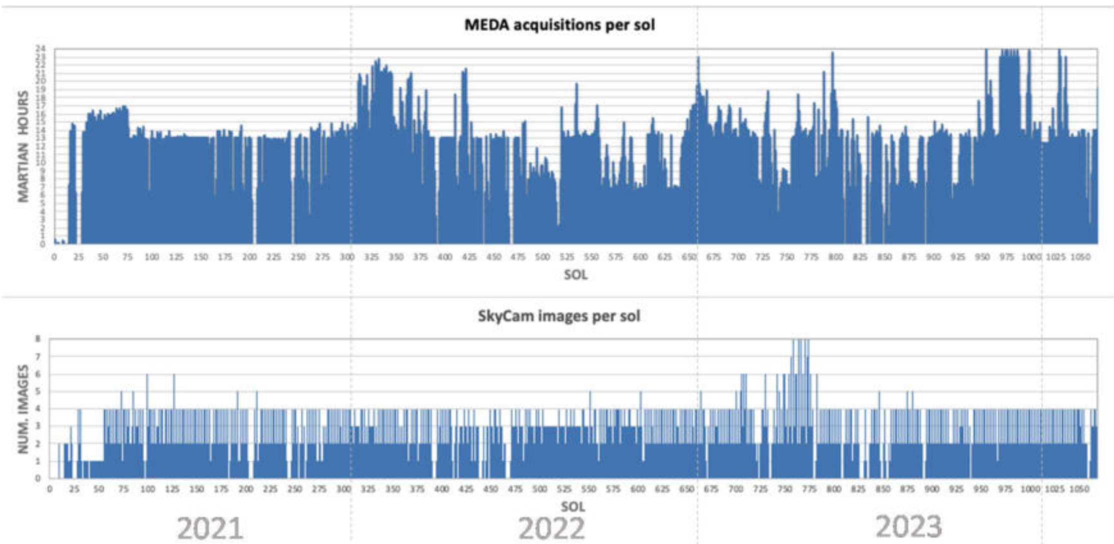


Figure RH1.2: MEDA scientific acquisitions per Martian day (called *sol*).

In addition to instrument operations, a set of tasks of a more technological nature have been carried out: New WS's calibration campaigns, to adapt to operational circumstances in which some sensor elements are degraded. The analysis and interpretation of TIRS's in-flight calibration sequences to estimate the degradation associated with dust deposition on the detectors and the drift of electronic conditioning systems. During this period, the team has also continued to study the daily variation of the amount of dust in suspension in the atmospheric column above the rover, as well as to monitor the processes of dust deposition and dust cleaning on the rover; obtained the first results of the local interaction of topography and temperature; study of Mars halos and clouds; comparison of sensor data with orbital observations; and the detailed study of alternative approaches for wind retrieval, given the damage caused by the local storms we have suffered throughout the observation period, to mention a few lines of work.

Also, the team worked on the update of tools and procedures in the ground segment software and flight software of the Instrument Control Unit (ICU) to introduce new performances and to implement new operating strategies, such as the data download in parallel with scientific acquisitions, and the latest operation method of Mars2020 called *Simple Planner*.

The environmental station REMS has been operating on the surface of Mars, since August 2012, collecting data on pressure, air and ground temperatures, wind speed and direction, atmospheric relative humidity, and incident ultraviolet radiation. Throughout the year 2023, the instrument has been running every day of the year except for 4 days, collecting more than 10.6 million readings from each of the sensors, which is equivalent to 8 Martian hours of measurement per sol. It has been operated 2 days a week, and scientific data have been delivered to the PDS (Planetary Data System) on three occasions.

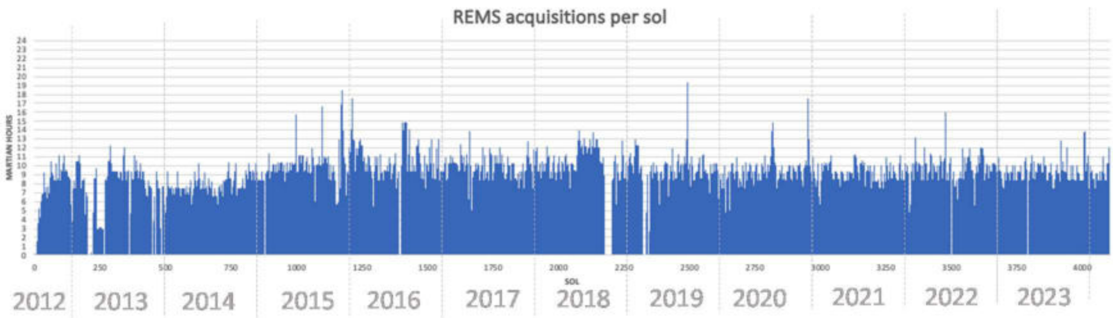


Figure RH1.3: REMS scientific acquisitions per sol.

In addition to the daily operation of REMS, the group participated in the analysis of the scientific data obtained by the instrument, also contributing to the discussions and scientific meetings, particularly the MSL Science Team Meeting celebrated in Toulouse in October 2023, bring together the national and international members of the REMS team.

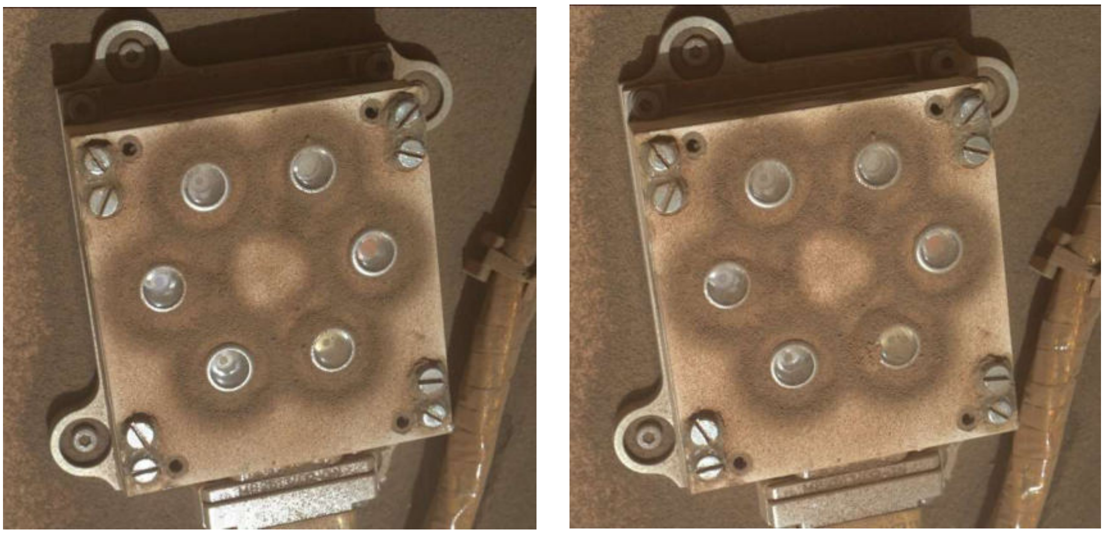


Figure RH1.4: REMS UV detail photographs taken by Mars Hand Lens Imager (MAHLI) during Martian operations, (left) Sep. 27th, 2023 the 3960th Martian day of the mission (right) Dic. 7th, 2023 the 4030th Martian day of the mission.

The group also worked in 2023 on the design of a new instrument called WAISR (Wind and Air density Instrument for Sample Return) for NASA's MSR (Mars Sample Return) mission. WAISR is a new meteorological station, an evolution of the previous ones, and consists of an atmospheric pressure sensor (Pressure Sensor - PS), a contact atmospheric temperature sensor (Atmosphere Temperature Sensor - ATS), a small infrared radiometer for measuring atmospheric temperature at a distance (InfraRed Atmosphere Temperature Sensor - IRATS), and four spherical sensors for 3D wind speed and direction measurement (spherical Wind Sensor – sph-WS). WAIRS is based on MEDA developments, except for the WS, whose mechanical and geometric design is new to increase its reliability and robustness during operation on Mars.

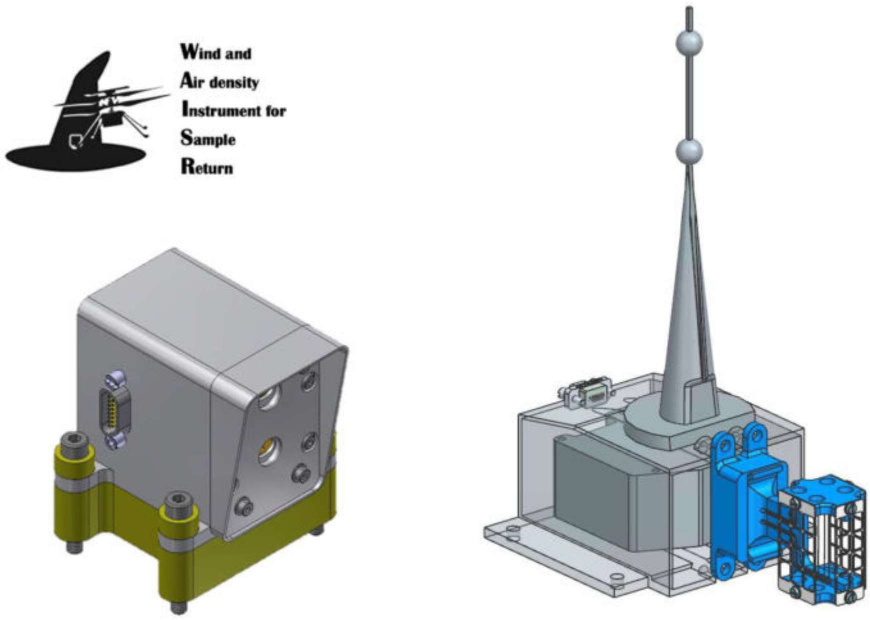


Figure RH1.4: Preliminary 3D designs for the WAISR Instrument Accommodation Review (IAR). (top-left) WAISR logo, (bottom-left) IRATS, and (right) WAISR WS and ATS.

For this new instrument, the CAB collaborates with national and international partners as the CRISA Airbus Defense and Space, AVS Added Value Solutions, the Polytechnic University of Catalonia, the Finnish Meteorological Institute (FMI), Instituto de Microelectrónica de Sevilla (IMSE-CNM), Instituto Universitario de Microgravedad "Ignacio Da Riva" from of the Polytechnic University of Madrid (IDR/UPM).

The main objective of WAISR in the context of the MSR mission is to provide information on atmospheric conditions, to support the flight and operation of the helicopters that are part of the lander of the mission. More specifically, the aim is to obtain, through onboard processing, the instantaneous values of atmospheric density, wind direction and speed in the range between 2 and 10 m above the surface.

Throughout 2023, the group's activities have focused on increasing the Technology Readiness Level (TRL) of the WS, as well as on the technical specification, preliminary design, and accommodation of the new station on the lander. On July 19^{th}-20^{th}, the Instrument Accommodation Review (IAR) held a CAB together with NASA-JPL, the formal review for the study of accommodation.

RH2: Study and modeling of Martian atmospheric dynamics and its main constituents.

In addition to the highlights mentioned above, the group was actively involved in the scientific exploitation of the data. REMS and MEDA instruments were collecting scientific data at Gale and Jezero craters respectively, characterizing the physical processes in the lowest layer of the Martian atmosphere.

These are some of the most relevant results published during the year 2023:

The diverse meteorology of Jezero crater over the first 250 sols of Perseverance on Mars

This article, published in the journal *Nature Geoscience*, presents a general summary of MEDA's measurements, revealing spatially and temporally variable meteorology at *Jezero* and its rich diversity of behaviors. Many of the measurements are the first time they have been obtained on Mars, revealing interesting surprises in Jezero's atmosphere.

The Surface Energy Budget (SEB) was measured for the first time in situ. The design of future engineering systems, the understanding and modeling of photochemical reactions at the surface, and the interpretation of satellite measurements benefit from these results. Another important result is the characterization of the non-Lambertian reflection of the surface that must be considered in the interpretation of orbital observations of variations in albedo when trying to understand changes in the physical properties of the surface.

Globally, the measured daily temperature cycle agrees with model predictions (although with some deviations in the vertical temperature gradient), the expected magnitude of thermal oscillations, and the seasonal evolution. In addition, the observed vortex convective activity matches the predictions of large eddy simulation models. Vertical temperature profiles show a diversity of nocturnal responses that raise intriguing questions about what is happening at the different locations traversed by the rover. The transition from a stable night-time thermal inversion to a daytime, highly turbulent convective regime, with large vertical thermal gradients.

Measurement of multiple daily optical depths suggests aerosol concentrations are higher in the morning than in the afternoon. Measured wind patterns are driven mainly by local topography, with a small contribution from regional winds. Daily and seasonal variability of relative humidity shows a complex hydrologic cycle.

These observations suggest that changes in some local surface properties, such as surface albedo and thermal inertia, play an influential role. On a larger scale, surface pressure measurements show typical signatures of gravity waves and baroclinic eddies in a part of the seasonal cycle previously characterized as low wave activity.

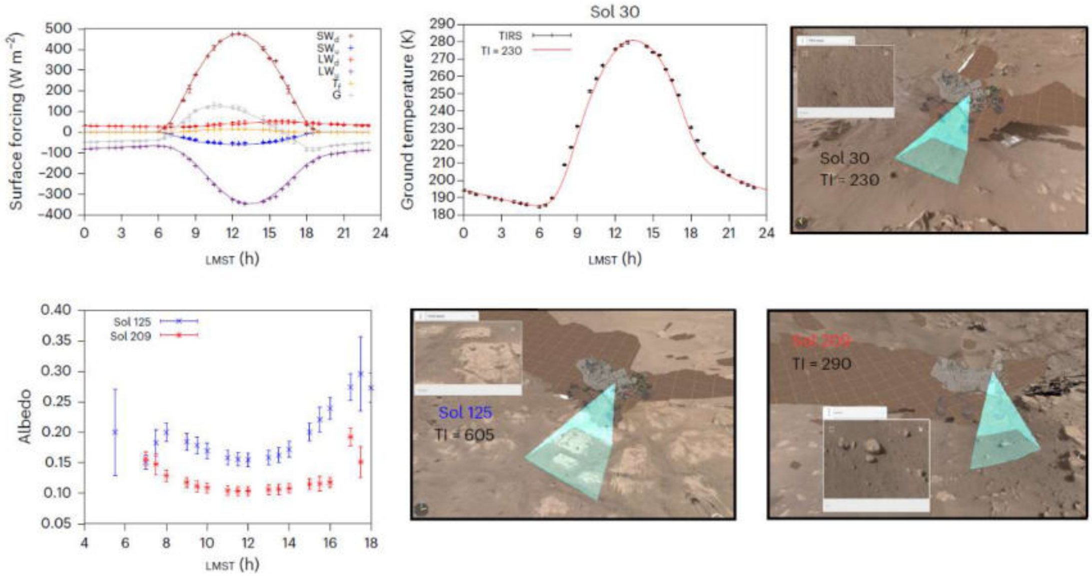


Figure RH2.1: Surface Energy Budget components measured by MEDA at Jezero for different sols.

Nocturnal Turbulence at Jezero Crater as Determined From MEDA Measurements and Modeling

In this article, published in the Journal of Geophysical Research: Planets, it is stated that continuous high-frequency atmospheric measurements by Mars 2020 Environmental Dynamics Analyzer (MEDA) sensors are key to unveiling the properties of Martian nighttime turbulence and provide valuable data for testing and refining the physics encapsulated within atmospheric models. Similarly, modeling efforts with the Mars Regional Atmospheric Modeling System (MRAMS) and the Mars Climate Database (MCD) enable the study of the seasonal evolution and variability of nocturnal atmospheric turbulence at the Jezero crater.

Nighttime conditions in Mars's Planetary Boundary Layer are highly stable because of strong radiative cooling that efficiently inhibits convection. However, MEDA nighttime observations of simultaneous rapid fluctuations in horizontal wind speed and air temperatures suggest the development of nighttime turbulence in Jezero crater. MRAMS results are in good agreement with MEDA observations, and this agreement provides justification for utilizing the model results to investigate the origin of the nocturnal turbulence environment of the Jezero crater region and the mechanisms at play. The model suggests that nighttime turbulence at Jezero crater is explained by increasingly strong wind shear produced by the development of an atmospheric bore-like disturbance at the nocturnal inversion interface.

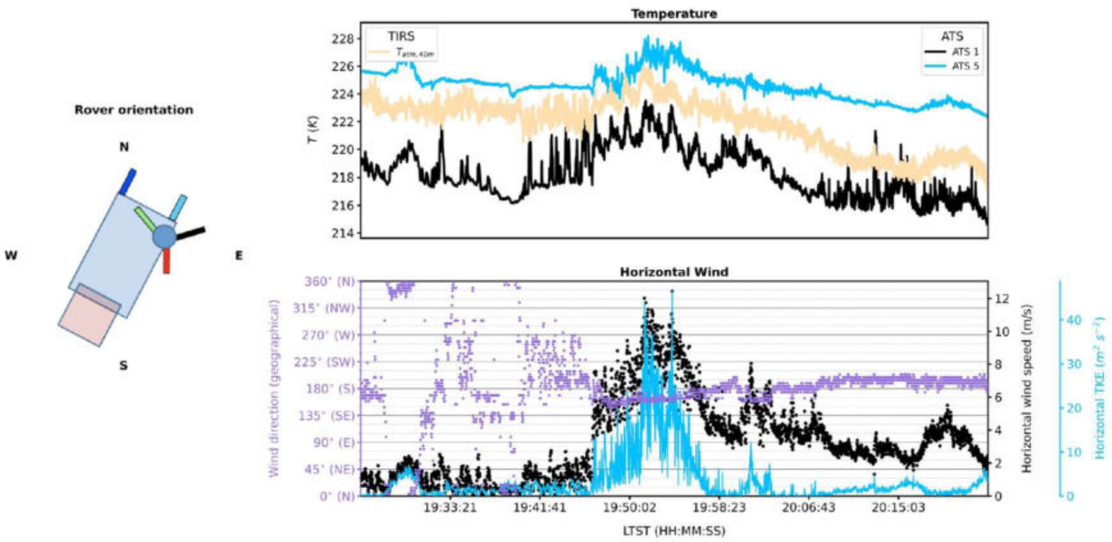


Figure RH2.2: Time series measured by MEDA at *Jezero* of atmospheric temperatures at the three height levels (MEDA ATS and TIRS), along with simultaneous turbulent kinetic energy derived from wind speed and direction (MEDA WS).

Dust Lifting Through Surface Albedo Changes at Jezero Crater, Mars

In this article, published in the Journal of Geophysical Research: Planets, temporal variations in surface albedo using MEDA sensors data are analyzed. Small particles at the surface of Mars are lifted and transported through interactions with the atmosphere, modifying the fraction of solar radiation reflected by the surface (albedo). MEDA measurements allow for unambiguous attribution of the dust lifting (dust removal) mechanisms inducing the albedo changes. These albedo changes are induced by dusty convective vortices and by a dust storm that affects the rover. The detected changes outside the dust storm period are attributed to dust devils, suggesting this mechanism is more frequent than gust lifting. The darkening of the surface induced by the storm is around 10 times larger than that caused in the absence of a storm by dust devils.

Only a fraction of the dust devils cause an albedo change, depending on their intensity, size, and trajectory, and on the features of the small particles at the surface. Dust devils inducing albedo changes typically show a transient drop in surface temperature, which is indicative of the lifting and transport of small particles. Hence, high-frequency surface temperature measurements allow for the detection of local aeolian processes when terrain features mask their effect on albedo. Mastcam-Z images support changes in the surface inferred by TIRS data during the dust storm.

The combined analysis of environmental variables, images, and microphone recordings acquired by the Mars 2020 mission improve the understanding of the processes involved in the lifting and transport of small particles.

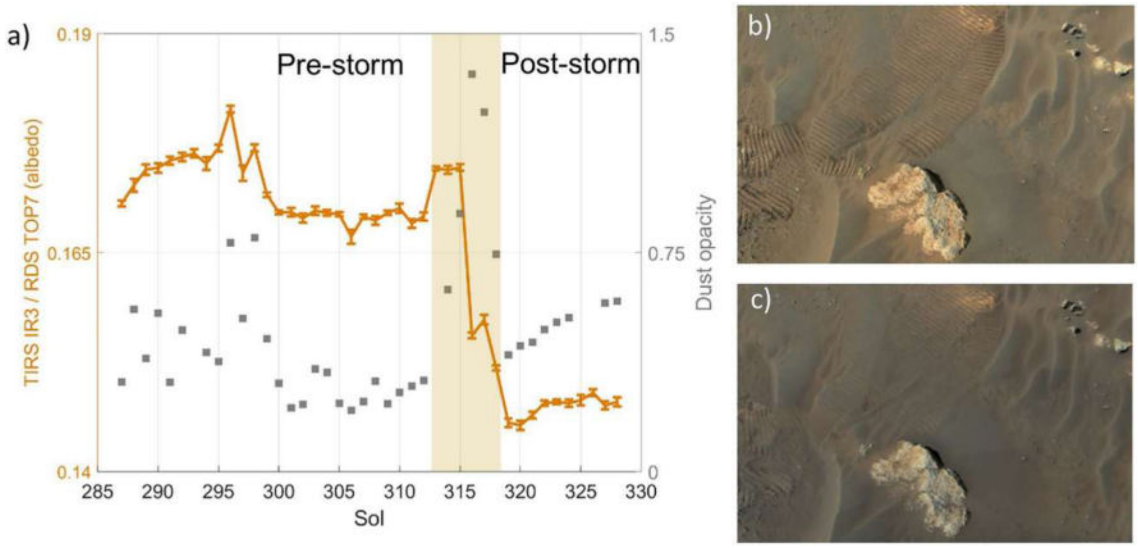


Figure RH2.3: (a) Change in surface albedo at 13:00 LMST (dark orange) and dust opacity around noon (gray) between sols 287 and 328. (b, c) Images of the Thermal and Infrared Sensor field of view before (b) and after (c) the dust storm.

RH3: Developing superconducting resonators for space and quantum applications

The Space Instrumentation group is also focused on developing superconducting circuits, a state-of-the-art enabling technology with applications that expands from the astronomical field towards its use for quantum processing and sensing, biology or security applications. Specifically, our research relays on two pillars: i) the design and fabrication of cutting-edge superconducting detectors for astronomical instrumentation, and ii) the development of superconducting circuits for quantum applications.

Regarding the first, we coordinate the Spanish Network for the developments of Kinetic Inductance Detectors (KIDs) for different applications. Among them, we are specially focused on the demonstration of a large-format camera with polarization sensitivity in the W-band suitable for future studies of the CMB. In this context, we participate in European Consortiums such as the NIKA2 and CONCERTO instruments, led by I. Néel in France for the increase of the TRL of the KIDs technologies. Moreover, we lead the Spanish consortium CADEx focused on the search of dark matter within the W-band using cryogenic haloscopes and ultrasensitive superconducting KID detectors.

Additionally, high-quality superconducting circuits are the ideal on-chip platform to operate, sense and characterize different quantum systems. Particularly, the CAB team is developing on-chip innovative superconducting circuits capable of coupling to small spin ensembles, aiming for the development of a functional molecular spin quantum processor unit. For this purpose, we are part of the Spanish CSIC Quatum Platform and the European FATMOLs FET-OPEN project, among others.

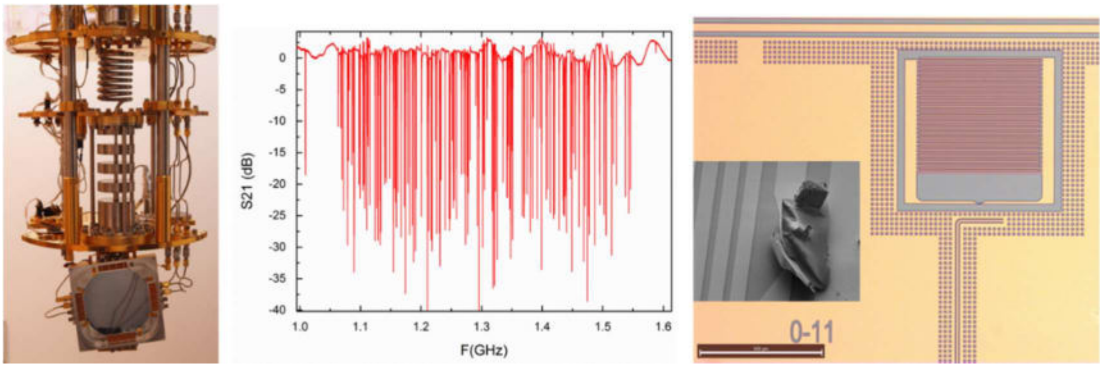


Figure RH3: <u>Left:</u> *Large format array of Ti-Al based Kinetic Inductance Detectors mounted on dilution cryostat for its characterization.* <u>Center:</u> *Cryogenic frequency sweep for superconducting resonators characterization. Each dip corresponds to each resonator coupled to the tested transmission line.* <u>Right:</u> *NbTiN Low Impedance Lumped Element Resonator for its coupling to nuclear transitions of Yb-Trensal microcrystals (shown in a SEM image as instet).*

RH4: Mimicking Planetary Subsoil in the Laboratory

Is it possible the emergence or survival of biological material under an ice layer within a Mars environment? The BGR (Biological Geological Reactor) makes the simulation possible. We have recreated the conditions for maintaining a sample with a minimum of hydration and protection from solar radiation. Under a layer of ice, the cavities have the habitable conditions necessary to maintain a biological mat, such as cyanobacteria, for longer periods in an extreme environment like Mars. The BGR simulates the frozen subsoil of the red planet.

In 2023, we realized the commissioning of the technology inside the MARTE vacuum chamber and prepared the system for the experiment with biological samples.

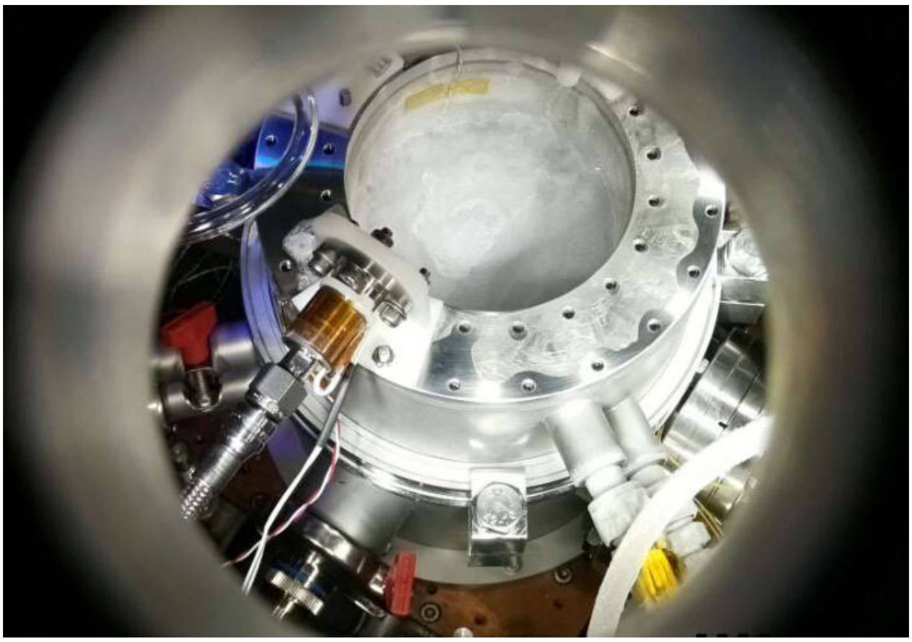
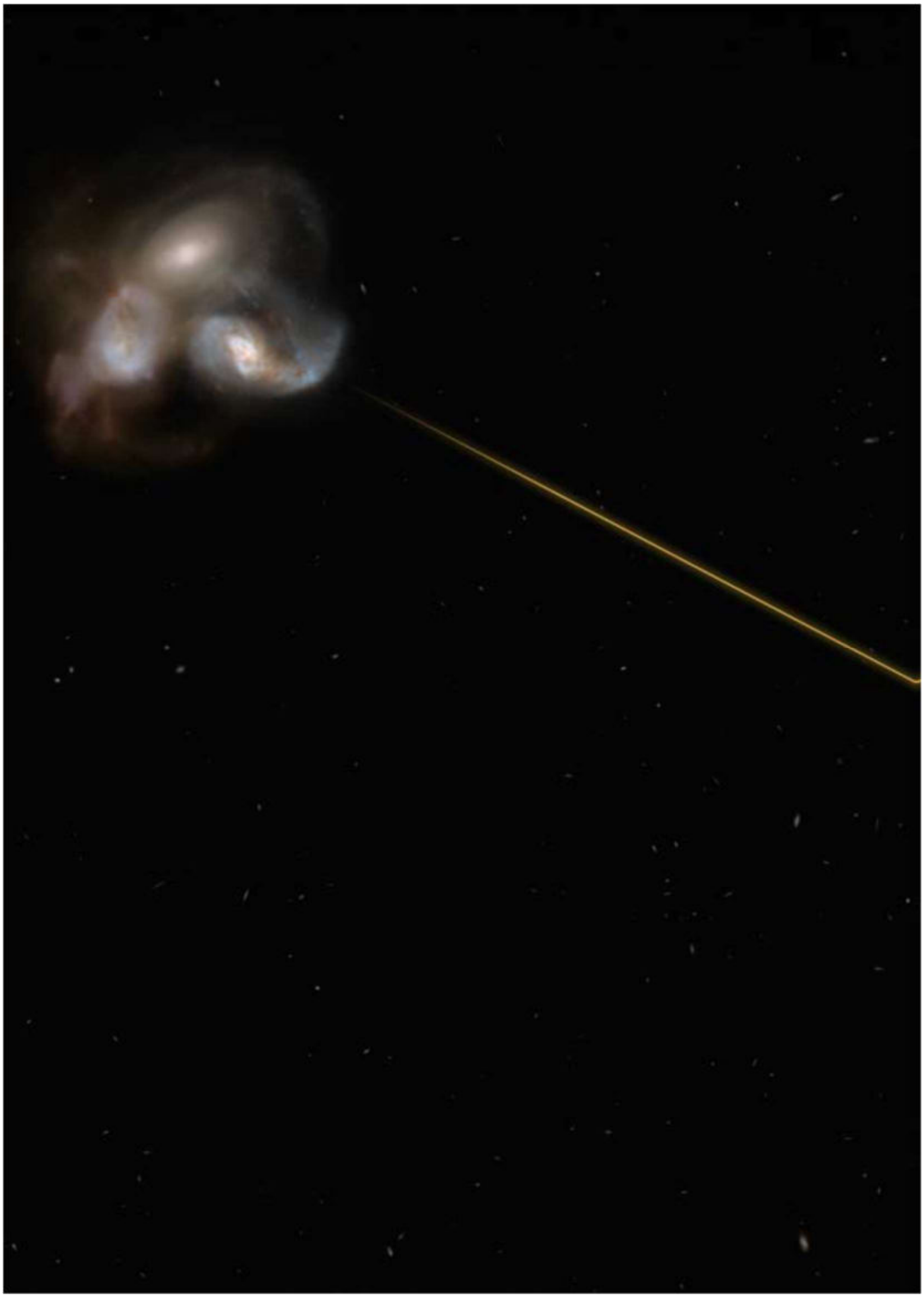


Figure RH4: *The Biological Geological Reactor inside the MARTE vacuum chamber is the device that simulates the subsoil under ice film.*

PhD and Master theses, funded projects, outreach

and other indicators



PhD Theses:

Name	Title	Director(s)	University	Date	Department
Alicia Rodríguez-Moreno	Adaptación de bacteriófagos a condiciones extremas de interés astrobiológico	Ester Lázaro	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
Alberto Álvarez Saavedra	Scientific Exploitation of Kepler, TESS and K2: Ages, Rotation and Binarity	David Barrado Navascués y María Morales Calderón	Universidad Complutense de Madrid	Ongoing	Astrofísica
Álvaro López Gallifa	Estudio comparativo de la complejidad química en regiones de formación estelar y objetos del sistema solar.	Víctor M. Rivilla	Universidad Complutense de Madrid	Ongoing	Astrofísica
Amadeo Castro González	Exploración de exoplanetas en el contexto de la misión PLATO: de la detección al estudio de poblaciones	Jorge Lillo Box David Barrado Navascués	Universidad Complutense de Madrid	Ongoing	Astrofísica
Andrés Megías Toledano	The origin of the Complex Organic Material in Prestellar Cores	I. Jiménez-Serra	Universidad Complutense de Madrid	Ongoing	Astrofísica
Antonio López-García	Prebiotic chemistry: Increasing molecular complexity in aqueous media	Marta Ruiz-Bermejo	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
Antonio Martínez-Henares	Characterization of the innermost regions around massive protostars	I. Jiménez-Serra	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Carlos del Burgo	Formation of COMs in interstellar ice analogs	H. Carrascosa, G. M. Muñoz Caro	Universidad Complutense de Madrid	Ongoing	Astrofísica
Carlos Cifuentes San Román	Astrophysical parameters of M dwarfs with exoplanets	José Antonio Caballero Hernández Jorge Sanz Forcada	Universidad Complutense de Madrid	24/03/2023	Astrofísica
Carlota Prieto Jiménez	Nature of star-forming galaxies and quasars at the Epoch of Reionization with JWST	Javier Álvarez Márquez y Michele Perna	Universidad Complutense de Madrid	ongoing (1st year)	Astrofísica
Carmen Blanco Prieto	Reionization and ISM/stellar Origins with JWST and ALMA	Javier Álvarez Márquez	Universidad Complutense de Madrid	ongoing (1st year)	Astrofísica

Carolina Martín Rubio	Caracterización de la atmósfera de Marte a partir de datos satelitales y en superficie	José Antonio Rodríguez Manfredi, Felipe Gómez Gómez, Álvaro de Vicente Retortillo	Universidad Complutense de Madrid	Ongoing	Instrumentación avanzada
Catalina Romero Guzmán	Thermal analysis of space systems in Martian conditions	José Antonio Rodríguez Manfredi e Isabel Pérez Grande	Universidad Politécnica de Madrid	Ongoing	Instrumentación avanzada
Cristina Pérez Fernández	Reactividad de polímeros de HCN en superficies: Química prebiótica.	Eva Mateo-Marti and Marta Ruiz-Bermejo	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
David Rodríguez Rodríguez	Integration of superconducting circuits and magnetic molecules for quantum technologies	Alicia Gómez and Fernando Luis	Universidad Autónoma de Madrid	Ongoing	Instrumentación avanzada
David San Andrés	Molecular precursors of the RNA world in the interstellar medium	Víctor M. Rivilla / Laura Colzi	Universidad Complutense de Madrid	Ongoing	Astrofísica
Diego Cuenda Muñoz	Analisis estadísticos de datos astronómicos ligados a la determinación de edades estelares a partir de obervaciones de PLATO y otros instrumentos	David Barrado Navascués	Universidad Complutense de Madrid	Ongoing	Astrofísica
Eduardo Alonso Pintado		Víctor Parro García and Mercedes Moreno Paz	Universidad de Alcalá de Henares	Ongoing	Evolución molecular
Eva Herrero Cisneros	Atmospheres of ultra-hot and hot massive planets	María Rosa Zapatero Osorio Jorge Sanz Forcada	Universidad Complutense de Madrid	Ongoing	Astrofísica
Felipe Ruymán Alonso Ravelo	"Production of extracellular vesicles containing DNA by the hyperhalophilic archaeon Haloquadratum walsbyi and study of their role in horizontal gene transfer".	José Eduardo González-Pastor	Universidad Autónoma de Madrid	Ongoing	Molecular Evolución
Francisco José Galindo Guil	A study of open clusters of different evolutionary ages	David Barrado Navascués	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Gema Martínez Esteve	Algorithm and fitting techniques from CFD simulations for the wind measurements of MEDA on NASA's Mars 2020 mission	Josefina Torres Redondo	Universidad de Alcalá de Henares	Ongoing	Instrumentación avanzada

Gonzalo José Carracedo Carballal	Desarrollo e implementación del modelo de apuntado de ELT-HARMONI y estudios científicos asociados	Javier Piqueras López and Miguel Pereira Santaella	Universidad Complutense de Madrid	ongoing (3rd year)	Astrofísica
Jaime Alonso-Hernández	Binariedad en estrellas AGBs: impacto en la física, química y evolución nebular	C. Sánchez Contreras, J. Sanz-Forcada	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Javier González Payo	Multiplicity of wide stellar systems, ultracool dwarfs and subdwarfs, and planetary hosts	Miriam Cortés y José Antonio Caballero	Universidad Complutense de Madrid	Ongoing	Astrofísica
Jesús Javier Rey Samper	Biogeochemical control in the formation and Evolución of key ore deposits.	A. Aguilera F. Tornos	Universidad Complutense de Madrid	Ongoing	Molecular Evolución
John Fabio Aguilar Sánchez	Caracterización fotométrica de estrellas de tipo F a M para la obtención de parámetros físicos mediante machine learning	Patricia Cruz and Enrique Solano	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Jorge Díaz-Rullo Aroco	"Search for new mechanisms of resistance to perchlorate in microorganisms from extreme environments"	José Eduardo González-Pastor	Universidad de Alcalá de Henares	Ongoing	Evolución Molecular
Jorge Guzmán Díaz	Herbig Ae/Be systems: stars, disks, and star-disk interactions	Ignacio Mendigutía Gómez and Benjamín Montesinos Comino	Universidad Autónoma de Madrid	19/01/2024	Astrofísica
Julián José Miranzo Pastor	Modeling the chemical Evolución on dust grain surfaces during the star formation process	A. Fuente, D. Navarro-Almaida	Universidad Complutense de Madrid	Ongoing	Astrofísica
Luis González Ramírez	Métodos estadísticos avanzados para determinar edades estelares	David Barrado Navascués	Universidad Complutense de Madrid	Ongoing	Astrofísica
Mara Laguna-Castro	Adaptation of bacteriophage Qβ to low host density	Ester Lázaro	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
María Ruiz Pérez	Estudio de la atmósfera marciana a partir de datos observacionales de la	Jorge Pla	Universidad Complutense de Madrid	Ongoing	Instrumentación avanzada

	primera red meteorológica en Marte (REMS-TWINS-MEDA) y de resultados de modelado meteorológico mesoescalar.				
Marina Calero de Ory	Superconducting Resonators for Space and Quantum Applications	Alicia Gómez and Daniel Granados.	Universidad Complutense de Madrid	Ongoing	Instrumentación avanzada
Marina Fernández-Ruz	Modeling of the origin of life as a complex and emergent process	Jacobo Aguirre and Marta Ruiz-Bermejo	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
Marta Lorenzo González	Sextans A, a Rosetta Stone for massive star formation and evolution at low metallicity	Miriam García García Francisco Najarro de la Parra	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Nerea Maestu Fonseca	Observación y representación del cosmos: los cometas en la tradición medieval hispana	Laura Fernández Fernández, Montserrat Villar Martín	Universidad Complutense de Madrid	Ongoing	Astrofísica
Olga Balsalobre Ruza	Planetas coorbitales y puntos de Lagrange: ¿La piedra Rosetta de la formación planetaria?	Jorge Lillo Box Nuria Huélamo Bautista	Universidad Complutense de Madrid	Ongoing	Astrofísica
Pablo de Lucía Finkel	Identification of degradation patterns and preservation of lipid biomarkers of astrobiological interest in extreme environments	Laura Sánchez García, Víctor Parro García	Universidad de Alcalá de Henares	Ongoing	Evolución molecular
Pablo Rodriguez Beltrán	Surface Brightness Fluctuations to constrain galaxy stellar populations	Alexandro Vazdekis, Miguel Cerviño, Mike Beasley	Universidad de La Laguna (Tenerife)	ongoing	Astrofísica
Patricia Fernández Ruiz	Multi-scale study of sulfur chemistry in hot corinos	A. Fuente, G. Esplugues (OAN)	Universidad Complutense de Madrid	Ongoing	Astrofísica
Pedro Mas Buitrago	Aplicación de técnicas de Machine Learning a cartografiados espectroscópicos y fotométricos”	Enrique Solano Márquez, Ana González Marcos	Universidad Complutense de Madrid	Ongoing	Astrofísica
Pedro Mustieles del Ser	Well conserved protein-peptide structures as target for Early Earth and – Mars life detection	Víctor Parro Garcia and David Ruano	Universidad de Alcalá de Henares	Ongoing	Evolución molecular

Raquel Murillo Ojeda	Enanas blancas con compañeras subestelares: Gaia y observatorio virtual	Francisco Jiménez Esteban, Alberto Rebassa Mansergas, Enrique Solano Márquez	Universidad Complutense de Madrid	Ongoing	Astrofísica
Raúl Castellanos Sánchez	Estrellas Masivas como Motores del Universo: Estudios en el IR-cercano	Francisco Najarro de la Parra Miriam García García	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Rita Sofia Dos Santos Severino	Ancestral proteis and peptidos as targets for life detection	Víctor Parro García, Mercedes Moreno Paz	Universidad de Alcalá de Henares	Ongoing	Evolución molecular
Rocio Navarro Martínez	Formación estelar y evolución de galaxias del cartografiado OTELO	Ana M. Pérez, Ricardo Pérez, Miguel Cerviño	Universidad Complutense de Madrid	ongoing	Astrofísica
Rosa María Mérida González	Extending star formation scaling relations down to $10^8 M_\odot$ at $1<z<3$ with HST, GTC, and ALMA	Pablo G. Pérez González, Patricia Sánchez Blázquez	Universidad Autónoma de Madrid	ongoing (thesis already submitted)	Astrofísica
Sandy Morais	Integral field observations and modeling of extended emission line halos in high redshift active galaxies.	Andrew Humphrey, Montserrat Villar Martín	Universidad de Oporto	ongoing (thesis already submitted)	Astrofísica
Santos Galvez-Martinez	Interacción entre aminoácidos y superficies de sulfuros metálicos: de la reactividad molecular a la química prebiótica	Eva Mateo-Marti	Universidad Autónoma de Madrid	14-12-2023 Read	Evolución Molecular
Sara Gómez de Frutos	"Effect of light and dark cycles on populations of hyperhalophilic microorganisms "	José Eduardo González-Pastor	Universidad Autónoma de Madrid	Ongoing	Evolución Molecular
Sofia Zurita Zurita	Application of signal processing methods to the Rover Environmental Monitoring Station data for the analysis of environmental processes on Mars	José Antonio Rodríguez Manfredi y Francisco Javier Escribano Aparicio	Universidad de Alcalá de Henares	Ongoing	Instrumentación avanzada
Víctor Muñoz Hisado	Diversidad microbiana en ambientes permanentemente helados	Cristina Cid Sánchez	Universidad Autónoma de Madrid	Ongoing	Evolución molecular

Master Theses

Name	Title	Director(s)	University	Date	Department
Aarón Vinagre Maqueda	CARMENES target characterisation: Carmencita and Gaia	Miriam Cortés Contreras	Universidad Complutense de Madrid	06/2023	Astrofísica
Abel Cuchi Olcina	Identificación de estrellas AGB mediante la creación y análisis de curvas de luz basadas en la fotometría de Gaia	Roberto Baena Gallé, Francisco M. Jiménez Esteban	Universidad Internacional de La Rioja	2023	Astrofísica
Adrián Meléndez Lorenzo	Analysis of high precision light curves of young stars with protoplanetary disks	Ignacio Mendigutía Gómez Jorge Lillo Box	Universidad Autónoma de Madrid	09/2023	Astrofísica
Alejandro Villar	Estudio de la radiación ionizante en el subsuelo de Marte	Daniel Viúdez Moreiras	Universidad Complutense de Madrid	Sept-2023	Instrumentación avanzada
Andrea Hidalgo Arias	Estudio de microorganismos extremófilos mediante secuenciación de DNA y análisis bioinformáticos	Cristina Cid Sánchez	Universidad Complutense de Madrid	July-24	Evolución molecular
Blanca Blasco García	Thermoanalytical techniques applied to the study of samples of astrobiological interest in the exploration of Mars.	Marta Ruiz Bermejo	Universidad Complutense de Madrid	Sep-23	Evolución Molecular
Carmen Castillo De La Cruz	Unveiling the invisible: Deep imaging of local analogs of high-z galaxies	Luca Costantin	Universidad Complutense de Madrid	ongoing	Astrofísica
Carmen San Nicolás Martínez	Life Tolerability Index of known exoplanets. Application to rocky planets	Patricia Cruzq	Universidad Complutense de Madrid	2023	Astrofísica
David Fernández Cava	Efecto de metales pesados en la actividad fotosintética de microalgas acidófilas extremófilas.	Á.Aguilera E. G. Toril	Universidad Autónoma de Madrid	Sep-23	Molecular Evolución
Diego Martín Carrero	Variabilidad fotométrica de enanas ultrafrías	María Rosa Zapatero Osorio	Universidad Complutense de Madrid	ongoing	Astrofísica

		Paulo Miles Páez			
Elio Quiroga	Exoplanetary civilizations: State of the art in the search for intelligence beyond the Earth	Jorge Lillo Box	VIU	09/2023	Astrofísica
Enrique Goitia Díaz	Search for binary systems with low-mass components with Gaia	Patricia Cruz y Maria Cruz Gálvez Ortiz	Universidad Complutense de Madrid	2023	Astrofisica
Guadalupe García Bote	Detección de biomarcadores en exoplanetas	José Antonio Caballero Hernández Miguel Angel de Pablo Hernández	Universidad Complutense de Madrid	06/2023	Astrofísica
Irene Molina	Efecto de metales pesados en la actividad fotosintética de Chlamydomonas acidophila.	Á.Aguilera E. G. Toril	Universidad Autónoma de Madrid	Sep-23	Molecular Evolución
Iván Encinas Mayoral	CARMENES target characterisation: Carmencita and transiting planets	José Antonio Caballero Hernández David Montes Gutiérrez	Universidad Complutense de Madrid	06/2023	Astrofísica
Jana Markovic	Dissecting the 30 Doradus analog in Sextans A with VLT-MUSE	Miriam García García Marta Lorenzo González	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Javier Mendez Gallego	Analysis of NIRCam imaging of ALMA [OIII]88um Emitters in the EoR	Javier Álvarez Márquez	Universidad Complutense de Madrid	15/06/23	Astrofísica
Juan Martínez García	Estrellas supergigantes rojas en las nubes de Magallanes	Lee R. Patrick	Universidad Autónoma de Madrid	Ongoing	Astrofísica
Léon Schiltz	Icy moon observations and ice experiments	Bruno Escribano, Guillermo M. Muñoz Caro	Univ. Técnica de Delft (P. Bajos)	Read oct-23	Astrofísica
Leonor Arriscado Nunes Ferreira Cardoso	The JWST rEvolución: morphological analysis of galaxies in the early Universe	Luca Costantin	Universidad Complutense de Madrid	ongoing	Astrofísica
Luis González Ramírez	CARMENES target characterisation: Carmencita and X-rays	José Antonio Caballero Hernández Jorge Sanz Forcada	Universidad Complutense de Madrid	06/2023	Astrofísica
Luis Miguel Peci Sánchez	Identificación y caracterización de objetos transitorios (transients)	Enrique Solano	Universidad Internacional de Valencia	Ongoing	Astrofisica

	usando el cartografiado ZTF y Observatorio Virtual.				
Manuel Alberto Corbinos	Búsqueda de planetas alrededor de enanas marrones	María Rosa Zapatero Osorio María Cruz Gálvez Ortiz	Universidad Complutense de Madrid	ongoing	Astrofísica
Marina Centenera	Complex organic molecules in prestellar cores: search for glycine in L1544	I. Jiménez-Serra	Universidad Complutense de Madrid	Jun-23	Astrofísica
Michelangelo Pantaleoni	Galactic structure from the kinematical analysis of massive stars with Gaia	Jesús Maíz Apellániz	Universidad Complutense de Madrid	06/2024	Astrofísica
Mousam Mondal	Morphological classification of eclipsing binariesusing Kepler light curves	Hugh Jones (UK), Patricia Cruz y Maria Cruz Gálvez Ortiz	University of Hertfordshire, UK	2023	Astrofisica
Melany Yalibeth Loera Osorio	"Efecto de la inserción de dos genes de resistencia en Escherichia coli para potenciar su 8 resistencia ante diferentes condiciones extremas"	José Eduardo González-Pastor	Universidad Anáhuac México	Ongoing	Molecular Evolución
Paula López Dones	Estudio de las envolturas moleculares de las pPNs "abandondas"	C. Sánchez Contreras, J. Alcolea (OAN)	Universidad Complutense de Madrid	Ongoing	Astrofísica
Pedro Hernández Cascales	The limits of the Universe: detecting high-redshift galaxies with JWST	Luca Costantin	Universidad Complutense de Madrid	16/06/2023	Astrofísica
Rocío Natividad Cataluña	Multicriteria method for determining the membership of a star in a cluster or moving group	Carlos del Burgo y Patricia Cruz	Universidad de Granada	2023	Astrofisica
Samuel Góngora	Mejorando los parámetros de planetas transitantes con masa conocida alrededor de enanas M cercanas	José Antonio Caballero Hernández David Montes Gutiérrez	Universidad Complutense de Madrid	09/2023	Astrofísica
Sergio Martín Blázquez	Estudio del efecto de la gravedad alterada sobre el crecimiento de plantas y microorganismos	Ester Lázaro	Universidad Politécnica de Madrid	sep-23	Molecular Evolución
Sergio Turrado	Modelado numérico de atmósferas planetarias en el sistema Trappist-1	Daniel Viúdez Moreiras y María Rosa Zapatero	Universidad Complutense de Madrid	Septiembre-2023	Instrumentación avanzada

Víctor Cortés Ortega	TFM + Prácticas académicas externas curriculares y extracurriculares in CAB (CSIC-INTA) for Máster Universitario en Ciencia y Tecnología desde el Espacio, University of Alcalá.	M.Á. de Pablo, A. Molina	Universidad de Alcalá de Henares	Abril'23 a Julio'23	Planetología y Habitabilidad

Degree Works

Name	Title	Director	University	Date	Department
Aitana Tasa Chaveli	*Estudio de la evolución e historia química de núcleos sin estrellas a través de la fracción de deuteración y las razones isotópicas moleculares*	A. Fuente, G. Esplugues (OAN)	Universidad Complutense de Madrid	Jun-24	Astrofísica
Amanda Jiménez Lobato	"Estudio de la regulación de los genes de biosíntesis de queuosina en *Bacillus subtilis*"	José Eduardo González-Pastor	Universidad Politécnica de Madrid	Mar-2023	Evolución Molecular
Andrea Hidalgo Arias	Study of endolithic microorganisms in volcanic rocks from Antarctica,	Cristina Cid Sánchez	Universidad Complutense de Madrid.	May-23	Evolución molecular
Gloria López Morales	"Estudio de la regulación transcripcional de los genes de biosíntesis de queuosina en Bacillus subtilis"	Carolina González de Figueras	Universidad de Alcalá de Henares	Sept-2023	Evolución Molecular
Juan Jusdado Serrano	Nueva calibración del Ground Temperature Sensor (GTS) del instrumento Rover Environmental Monitoring Station (REMS) a bordo del Rover de NASA Curiosity	Eduardo Sebastián Martínez	Universidad Politécnica de Madrid	Diciembre-2023	Instrumentación avanzada

Lara Moral Almansa	Completando el catálogo de moléculas orgánicas complejas en núcleos sin estrellas	A. Fuente, M. Rodríguez-Baras (OAN)	Universidad Complutense de Madrid	Jun-24	Astrofísica
Michelangelo Pantaleoni	Massive stars in the solar neighbourhood with Gaia EDR3	Jesús Maíz Apellániz	UCM	06/2023	Astrofísica
Paula López Dones		C. Sánchez Contreras, J. Alcolea (OAN)		Ongoing	Astrofísica
Patricia Herrero González	Diversidad microbiana y mecanismos moleculares de adaptación en ecosistemas extremos	Á.Aguilera E. G. Toril	Universidad Autónoma de Madrid	Feb-23	Evolución Molecular
Sandra Martínez González	Estudio del proteoma bacteriano en condiciones extremas	Cristina Cid Sánchez	Universidad Autónoma de Madrid	May-23	Evolucion molecular
Timon Kielhas	*Laboratory Simulation for the Photodesorption of H2S in Ice Mantles in Molecular Clouds*	R. Martín Doménech, Guillermo M. Muñoz Caro	Univ. Técnica de Aachen (Alemania)	Read dic-23	Astrofísica

JAE Intro

Name	Title	Director(s)	Date	Department
Abel Cuchi Olcina	Selección de muestra para seguimiento en busca de compañeros planetarios en estrellas frías	Maria Cruz Galvez Ortiz	30/04/2024	Astrofísica
Ángel Álvarez Paredes	Reconstrucción hidrológica en la zona de aterrizaje de la misión ExoMars	Antonio Molina Jurado	30/04/2024	Planetología y habitabilidad
Daniel Bördner Cano	Formación en técnicas para el desarrollo de un sistema de lectura multiplexado para detectores superconductores tipo Kinetic Inductante Detectors.	Alicia Gomez Gutierrez	28/02/2025	Instrumentación
Diego Martín Carrero	Search for photometric variability and determination of physical parameters in very low-mass stars and brown dwarfs	Paulo Alberto Miles Paez	31/05/2024	Astrofisica
Eloisa Sintes Rodriguez	Reconstrucción topográfica y modelización numérica del sistema hídrico de Nepenthes Mensae, Marte	Antonio Molina Jurado	15/03/2025	Planetología y habitabilidad
Helena Martín Caballero	Molecular precursors of the rna-world in the interstellar medium	Victor Manuel Rivilla Rodriguez	30/04/2024	Astrofísica
Irene Garbajosa Suárez		Miriam Garcia García	31/05/2024	Astrofísica
Marta Rey Montejo	Búsqueda de moléculas pre-bióticas en el medio interestelar y su relación con el origen de la vida	Izaskun Maite Jimenez Serra	30/04/2024	Astrofísica
Oscar Menéndez García	Buscando huellas enzimáticas de un metabolismo ancestral	Marta Ruiz Bermejo	31/07/2024	Evolución molecular
Victor Lopez Muñoz	Exploración de los límites de la adaptación en poblaciones virales	Ester Lázaro Lázaro	15/03/2025	Evolución molecular
Marcos Martinez Jimenez	Interacción entre redes complejas: teoría y aplicaciones en el ámbito de la Astrobiología	Jacobo Aguirre Araujo	31/07/2023	Evolución molecular
Alexandro Serrano Sánchez	Hacia el mundo RNA en el origen de la vida: polimerización de ribonucleótidos sobre superficies de arcillas	Carlos Briones Llorente	31/07/2023	Evolución molecular

Erasmus

Name	Title	Director	University	Date	Department
Leila Mahboub	Study of antibody microarrays to characterize microbial biomarkers of samples from extreme environments in the laboratory's collection to contribute to the development of immunosensors in the context of planetary exploration and the LDChip	Mercedes Moreno Paz	AgroParisTech University (France).	06-2023 – 08-2023	Evolución molecular
Xosé Manuel Tomé Castro	Antibody microarrays for testing gut microbial indicators of health	Mercedes Moreno Paz	International Space University (ISU, France)	07-2023 – 08-2023	Evolución molecular

Ongoing Funded Projects

IP(s)	Title	Funding Source	Code No.	Amount	Department
A. Fuente Juan	The trail of sulphur: from molecular clouds to life (SUL4LIFE)	ERC Advanced	ERC AdG 2022 – GA No101096293	2.191.875€	Astrofísica
A. Fairén	The physicochemical nature of water on early Mars	ERC	818602	1.998.37€	Planetologia y habitabilidad
A. Garcia Jerez	Caracterización geofísica de la geometría estructural profunda del relleno sedimentario en la cuenca neógena de tabernas (Almería SE España)	Proyectos de I+D en el marco del Programa Operativo FEDER Andalucía 2014-2020 Proyectos de Fomento y Generación de Conocimiento “Frontera”	UAL2020-RNM-B1980	30.000€	Planetologia y habitabilidad
Alicia Gómez Gutiérrez	Tecnologías Cuánticas – Circuitos Superconductores	Plataforma Temática Interdisciplinar CSIC			Instrumentación avanzada
Alicia Gómez Gutiérrez	FAult Tolerant MOLecular Spin processor (FATMOLS)	H2020 FET-Open		53.751,25€	Instrumentación avanzada

Alicia Gómez Gutiérrez / Jesús Martín-Pintado	SUPERconducting circuits for HYbrid QUantum Processing unit (SUPERHYQUP)	Agencia Estatal de Investigación, Proyectos de Transición Ecológica y Transición Digital		150.650€	Instrumentación avanzada
Ana Belén Galán Abellán	Precipitación mineral en medios ácidos y sus implicaciones en la habitabilidad	Ayudas a proyectos de i+d dentro del programa de estímulo a la investigación de jóvenes doctores financiada en el marco del convenio entre la universidad autónoma de Madrid y la comunidad de Madrid relativo a los años 2019-2024	SI3/PJI/2021-00328	37.090€	Evolución Molecular
Ana Moreno Caballud	Las cuevas de hielo del Parque Nacional de Ordesa y Monte Perdido: dinámica actual ante el cambio global y reconstrucción paleoambiental (ORCHESTRA).	Red de Parques Nacionales. Ministerio para la Transición Ecológica y el Reto Demográfico 2552/2020	2552/2020. 2020-2024		Evolución Molecular
Ángeles Aguilera	Life as a geochemical control in the formation and Evolución of key ore deposits (superMIN).	Ministerio de Ciencia e Innovación	PID2022-138986OB-I00	212.000€	Evolución Molecular
Azua Bustos	Unveiling the Lost Living Fossil Ecosystems of the Atacama Trench	Schmidt Ocean Institute	No aplica	3.5M USD	Planetologia y habitabilidad
Azua Bustos	UV- Energy, Evolutionary puzzles: Do microbes in the Atacama Desert harvest UV as an energy source?	Human Frontiers Science Program Grant	RGY0066/2018	658.000€	Planetologia y habitabilidad
C. Sánchez Contreras	PN Genesis: outflows, mass-loss and jet-launching (GENESIS)	MICINN	PID2019-105203GB-C22	104.060€	Astrofísica
C. Sánchez Contreras	Estudio multi-longitud de onda en estrellas AGB con emisiones de alta energía. Nuevo acercamiento en la búsqueda y caracterización de binariedad en estrellas AGB.	CSIC	IMOVE23023	4.050€	Astrofísica

Carlos Briones	Development, characterization and applications of aptamers as new biotechnological tools for virus detection and antiviral therapy’	Ministerio de Ciencia, Innovación y Universidades; Programa Estatal I+D+i Orientada a los Retos de la Sociedad	PID2019-104903RB-I00 Duration: 01/06/2020 to 31/12/2023	100.000€	Evolución Molecular
Carlos Briones	Graphene aptasensor bioelectronics: a neuronal interface for neurotransmission probing in neurological disorders	“La Caixa” Foundation, Health Research 2021 Call	HR21-00410	908.539,19€	Evolución Molecular
Daniel Puyol	Fundamentals and applications of purple bacteria biotechnology for resource recovery from waste (PURPLEGAIN)	COST Action	060/22 CA21146		Evolución Molecular
Daniel Carrizo	Science and Instrumentation for the study of (bio) geochemical processes in Mars.	MINECO	RED2022-134726-T. 2022-2024.	20.000€	Planetologia y habitabilidad
Daniel Carrizo	Extreme Environments in Planetary Exploration: Geolipids, Stable Isotopes and Minerals in King Gorge Island, Antarctica	IAU (Uruguayan Antarctic Institute			Planetologia y habitabilidad
David Hochberg	Mirror-symmetry breaking in continuous flow chemical processes: theoretical analysis and applications to catalysis	Ministerio de Ciencia e Innovación	PID2020-116846GB-C22	28.798€	Evolución Molecular
Elena G. Toril and Cristina Cid	Ciclo de aerosoles en Marte y La Tierra, estudio comparativo. Implicaciones para la vida y protección planetaria (CAMELIA-MICRO).	Ministerio de Ciencia e Innovación	PID2019-104205GB-C22	88.693€	Evolución Molecular
Elena G. Toril	PIE-Ayudas Extraordinarias Proyecto de referencia: CAMELIA-MICRO	CSIC	2023AEP052	9.162€	Evolución Molecular

Enrique Solano Márquez	El Observatorio Virtual Español. Explotación científico-técnica de archivos astronómicos	Ministerio de Ciencia e Innovación	PID2020-112949GB-I00	209.935€	Astrofisica
Enrique Solano Márquez	The Gaia DR3 Catalogue of Galactic AGB Stars	European Space Agency	4000139151/22/ES/CM	60.000€	Astrofisica
Ester Lázaro	Experimental Evolución of an RNA bacteriophage: Influence of contact networks, external environment, and pre-existing mutations (EVOLCEM).	MCIN/AEI	PID2020-113284GB-C22	91.960€	Evolución molecular
Eva Mateo-Marti and Marta Ruiz-Bermejo	Simulaciones experimentales de química prebiótica: contribuciones, bio-firmas y protocolos para el retorno de muestras de marte.	Ministerio de Ciencia e Innovación	PID-2022-1401800B-C22	86.250€	Evolución Molecular
Eva Mateo-Marti (coordinador D. Carrizo-Gallardo)	Ciencia e instrumentación para el estudio de procesos (bio)geoquimicos en marte.	Ministerio de Ciencia e Innovación	RED2022-134726-T	20.300€	Evolución Molecular
F. Gómez	DAXE	DM	EJS22001	90.000€	Planetologia y habitabilidad
F. Cañadas	Mars Phosphorus and LifE	MSCA	101022397	172.932,48€	Planetologia y habitabilidad
Francisco Najarro de la Parra y I. Jiménez Serra	CAB Contribution to SPICA, development of cryogenic instrumentation and multiwavelength scientific exploitation	Ministerio de Ciencia e Innovación	PID2019-105552RB-C41	1.108.965€	Astrofísica
Francisco Najarro / Alicia Gómez	Spanish Contribution to PRIMA, development of cryogenic instrumentation and multiwavelength scientific studies (ESPRIMA)	Proyectos de Generación de Conocimiento 2022		517.500€	Instrumentación avanzada
Francisco Najarro	Kidsnet: madurando la tecnologia kids	AEI	RED2022-134839-T	119.700€	Astrofísica

G. M. Muñoz Caro	Astrophysical ice processes	Ministerio de Ciencia e Innovación	PID2020-118974GB-C21	70.180€	Astrofísica
Giovanni Lamanna and Enrique Solano	European Science Cluster of Astronomy & Particle physics ESFRI research Infrastructure	European Comission. H2020 Programme. Connecting ESFRI infrastructures through Cluster projects	INFRA-EOSC-4-2018	126.468,75€	Astrofisica
I. Jiménez-Serra / Víctor M. Rivilla	Emergence and Evolución of Chemical COmplexity in Space (EECCOS)	Ministerio de Ciencia e Innovación	PID2022-136814NB-I00	377.500€	Astrofísica
J.E. González Pastor	Closing the circle: from cultures and function to genomes and metagenomes and back in a salinity gradient (METACIRCLE).	Ministerio de Ciencia e Innovación	PID2021-126114NB-C43	231.110€	Evolución Molecular
J.E. González-Pastor	Innovative tools for sustainable exploration of marine microbiome innovative tools for sustainable exploration of marine microbiomes: towards a circular blue bioeconomy and healthier marine environments (BlueTools).	Programme: Horizon	HORIZON-CL6-2022-CIRCBIO-01.	623.382,5€	Evolución Molecular
J. Miguel Mas Hesse	Contribución del cab+inta/sge a la misión espacial plato2.0. fase c/d-1	MICIU/AEI	PID2019-107061GB-C61	1.844.89€	Astrofísica
Jacobo Aguirre	Interacción entre redes complejas: Teoría y aplicaciones en el ámbito de la astrobiología (NetWorld)	Ministerio de Ciencia e Innovación	PID2021-122936NB-I00	36.300€	Evolución Molecular
Jens Ormö	CONCENTRIC, COsmic impacts on plaNetary bodies: projeCtile and targEt properties as iNstruments to assess paleo-environmenTs and catastrophic rIsk to Civilization	State Agency of Research MCIN/AEI/ 10.13039/50110001103 3 and by “ERDF A way of making Europe”	PID2021-125883NB-C22	250.833€	Planetología y Habitabilidad

Jens Ormö	Contribution to the DART-Hera (NASA/ESA) missions: a combined capacity of numerical and experimental simulations of heterogeneous materials	Spanish Research Council (CSIC) support for international cooperation: I-LINK	ILINK22061	22.554,40€	Planetologia y Habitabilidad
Jesús Manuel Sobrado Vallecillo	Imitando el subsuelo planetario en el laboratorio (MPSL).	PLAN NACIONAL I+D	PID2020-114047GB-100	96.500€	Instrumentación avanzada
José Antonio Rodríguez Manfredi /Eduardo Sebastián Martínez	M3LEC Ciencia y tecnología de instrumentación para la caracterización del entorno marciano en múltiples misiones de NASA -IV: REMS (Fase E), TWINS (Fase E) y MEDA (Fase E)	PLAN NACIONAL I+D	PID2021-126719OB-C41	968.000€	Instrumentación avanzada
L. Sánchez-García y P.L. Finkel.	Life detection and biosignature preservation studies via lipid biomarker analysis in Makgadikgadi Salt Pans, an evaporitic Mars analogue in Botswana	EuroPlanet TA1-Planetary Field Analogues	22-EPN3-026	10.000€	Evolución Molecular
Laura Sánchez-García.	Forensic Geochemistry: on the search for biosignatures in extreme environments by exploiting molecular and isotopic tools (RyC Project).	Ministerio de Ciencia e Innovación (MICINN)	RYC2018-023943-I	308.600€	Evolución Molecular
Luis Somoza Losada	Sistemas hidrotermales submarinos, recursos y materias primas críticas entre las islas canarias y la dorsal medio-atlántica. ATLANTIS.	Ministerio de Ciencia e Innovación	PID2021-124553OB-I00	172.000€	Evolución Molecular
MªPaz Zorzano-Mier and Carmen Cordoba Carbonero	Ciclo de aerosoles en marte y la tierra, estudio comparativo. implicaciones para la vida y proteccion planetaria-atmosferas (camelia-atm)	Ministerio de Ciencia e Innovación, PLAN ESTATAL de I+D+I	PID2019-104205GB-C21	88.000€	Evolución Molecular

Maria Paz Zorzano and Carmen Córdoba	Camelia-atm (ciclo de aerosoles en marte y la tierra, estudio comparativo implicaciones para la vida y proteccion planetaria-atmosferas	MCIN/AEI/ 10.13039/50110001103 3,	code PID2019-104205GB-C21, duration 3 years and 7 months	73.300€	Planetologia y habitabilidad
Maria Paz Zorzano y Daniel Carrizo	Mars-phys (entorno fisico de las muestras de marte: adquisicion, documentacion e irradiacion de muestras y analisis de muestras analogas	MCIU/AEI /10.13039/5011000110 33 / FEDER, UE	PID2022-140180OB-C21	86.250€	Planetologia y habitabilidad
Maria Rosa Zapatero Osorio	Enanas marrones y planetas aislados y alrededor de estrellas	AEI	PID2019-109522GB-C51	428.900€	Astrofisica
Olga Prieto-Ballesteros y Daniel Carrizo Gallardo	Operación técnica y explotación científica de datos en RIs de exomars, y contribución al Rax de MMX	Ministerio de Ciencia e Innovación, PLAN ESTATAL de I+D+I	PID2019-107442RB-C32	665.379€	Planetología y Habitabilidad
Olga Prieto Ballesteros	Espectroscopia raman para exomars y mmx: liderazgo tecnico, operaciones y actividades cientificas.	Spanish Ministry of Science and Innovation /AEI	PID2022-142490OB-C31	119.790€	Planetologia y habitabilidad
Olga Prieto Ballesteros	Raman spectroscopy for exomars-cab	Spanish Ministry of Science and Innovation /AEI	PCI2023-145992-2	517.500€	Planetologia y habitabilidad
Sergio Alonso (UPC) and Jacobo Aguirre	Dinámica No Lineal en sistemas biofísicos.	Ministerio de Ciencia e Innovación	RED2022-134573-T	20.300€	Evolución Molecular
Víctor M. Rivilla	Cosmic Origins of Life COOL	CSIC	20225AT015	150.000€	Astrofísica
Víctor M. Rivilla	Cosmic Origins of Life COOL	MICINN	RYC2020-029387-I	324.250€	Astrofísica
Víctor Parro y Laura Sánchez-García	Detección de señales de vida actual y pasada en exploración planetaria (SOLID)	Agencia Estatal de Investigación (AEI, MICINN),	PID2021-126746NB-I00	181.500€	Evolución Molecular
Xavier Luri	Red Española de Explotación Científica de Gaia	Ministerio de Ciencia, Innovación y Universidades	RED2022-134612-T	20.600€	Astrofisica

Publications

(Articles and Reviews)

Abrevaya X.C., Galante D., Tribelli P.M., Oppezzo O.J., Nobrega F., Araujo G.G., Rodrigues F., Odert P., Leitzinger M., Ricardi M.M., Varela M.E., Gallo T., Sanz-Forcada J., Ribas I., Porto De Mello G.F., Rodler F., Cerini M.F., Hanslmeier A., Horvath J.E. "Protective Effects of Halite to Vacuum and Vacuum-Ultraviolet Radiation: A Potential Scenario during a Young Sun Superflare" Astrobiology, 23 (3), pp. 245 – 268

Aguado D.S., Caffau E., Molaro P., Allende Prieto C., Bonifacio P., González Hernández J.I., Rebolo R., Salvadori S., Zapatero Osorio M.R., Cristiani S., Pepe F., Santos N.C., Cupani G., Di Marcantonio P., Daodorico V., Lovis C., Nunes N.J., Martins C.J.A.P., Milakovi D., Rodrigues J., Schmidt T.M., Sozzetti A., Suárez Mascareño A. "The pristine nature of SMSS 1605-1443 revealed by ESPRESSO" Astronomy and Astrophysics, 669, art. no. L4

Aguirre J., Guantes R. "Virus-host protein co-expression networks reveal temporal organization and strategies of viral infection" iScience, 26 (12), art. no. 108475

Agúndez M., Marcelino N., Tercero B., Jiménez-Serra I., Cernicharo J. "Abundance and excitation of molecular anions in interstellar clouds" Astronomy and Astrophysics, 677, art. no. A106

Ahrer E.-M., Alderson L., Batalha N.M., Batalha N.E., Bean J.L., Beatty T.G., Bell T.J., Benneke B., Berta-Thompson Z.K., Carter A.L., Crossfield I.J.M., Espinoza N., Feinstein A.D., Fortney J.J., Gibson N.P., Goyal J.M., Kempton E.M.-R., Kirk J., Kreidberg L., López-Morales M., Line M.R., Lothringer J.D., Moran S.E., Mukherjee S., Ohno K., Parmentier V., Piaulet C., Rustamkulov Z., Schlawin E., Sing D.K., Stevenson K.B., Wakeford H.R., Allen N.H., Birkmann S.M., Brande J., Crouzet N., Cubillos P.E., Damiano M., Désert J.-M., Gao P., Harrington J., Hu R., Kendrew S., Knutson H.A., Lagage P.-O., Leconte J., Lendl M., MacDonald R.J., May E.M., Miguel Y., Molaverdikhani K., Moses J.I., Murray C.A., Nehring M., Nikolov N.K., Petit dit de la Roche D.J.M., Radica M., Roy P.-A., Stassun K.G., Taylor J., Waalkes W.C., Wachiraphan P., Welbanks L., Wheatley P.J., Aggarwal K., Alam M.K., Banerjee A., Barstow J.K., Blecic J., Casewell S.L., Changeat Q., Chubb K.L., Colón K.D., Coulombe L.-P., Daylan T., de Val-Borro M., Decin L., Dos Santos L.A., Flagg L., France K., Fu G., García Muñoz A., Gizis J.E., Glidden A., Grant D., Heng K., Henning T., Hong Y.-C., Inglis J., Iro N., Kataria T., Komacek T.D., Krick J.E., Lee E.K.H., Lewis N.K., Lillo-Box J., Lustig-Yaeger J., Mancini L., Mandell A.M., Mansfield M., Marley M.S., Mikal-Evans T., Morello G., Nixon M.C., Ortiz Ceballos K., Piette A.A.A., Powell D., Rackham B.V., Ramos-Rosado L., Rauscher E., Redfield S., Rogers L.K., Roman M.T., Roudier G.M., Scarsdale N., Shkolnik E.L., Southworth J., Spake J.J., Steinrueck M.E., Tan X., Teske J.K., Tremblin P., Tsai S.-M., Tucker G.S., Turner J.D., Valenti J.A., Venot O., Waldmann I.P., Wallack N.L., Zhang X., Zieba S. "Identification of carbon dioxide in an exoplanet atmosphere" Nature, 614 (7949), pp. 649 – 652

Akins H.B., Casey C.M., Allen N., Bagley M.B., Dickinson M., Finkelstein S.L., Franco M., Harish S., Haro P.A., Ilbert O., Kartaltepe J.S., Koekemoer A.M., Liu D., Long A.S., McCracken H.J., Paquereau L., Papovich C., Pirzkal N., Rhodes J., Robertson B.E., Shuntov M., Toft S., Yang G., Barro G., Bisigello L., Buat V., Champagne J.B., Cooper O., Costantin L., de la Vega A., Drakos N.E., Faisst A., Fontana A., Fujimoto S., Gillman S., Gómez-Guijarro C., Gozaliasl G., Hathi N.P., Hayward C.C., Hirschmann M., Holwerda B.W., Jin S., Kocevski D.D., Kokorev V., Lambrides E., Lucas R.A., Magdis G.E., Magnelli B., McKinney J., Mobasher B., Pérez-González P.G., Rich R.M., Seillé L.-M., Talia M., Urry C.M., Valentino F., Whitaker K.E., Yung L.Y.A., Zavala J. "Two Massive, Compact, and Dust-obscured Candidate z ≃ 8 Galaxies Discovered by JWST" Astrophysical Journal, 956 (1), art. no. 61

Alberton D., Bizzocchi L., Jiang N., Melosso M., Rivilla V.M., Charmet A.P., Giuliano B.M., Caselli P., Puzzarini C., Alessandrini S., Dore L., Jiménez-Serra I., Martín-Pintado J. "Laboratory spectroscopy of allylimine and tentative detection towards the G+0.693-0.027 molecular cloud" Astronomy and Astrophysics, 669, art. no. A93

Alberton D., Lattanzi V., Endres C., Rivilla V.M., Guillemin J.C., Caselli P., Jiménez-Serra I., Martín-Pintado J. "A High-resolution Spectroscopic Analysis of Aminoacrylonitrile and an Interstellar Search toward G+0.693" Astrophysical Journal, 951 (2), art. no. 108

Alessandrini S., Melosso M., Rivilla V.M., Bizzocchi L., Puzzarini C. "Computational Protocol for the Identification of Candidates for Radioastronomical Detection and Its Application to the C3H3NO Family of Isomers" Molecules, 28 (7), art. no. 3226

Almeida C.R., Esparza-Arredondo D., González-Martín O., García-Bernete I., Pereira-Santaella M., Alonso-Herrero A., Acosta-Pulido J.A., Bessiere P.S., Levenson N.A., Tadhunter C.N., Rigopoulou D., Martínez-Paredes M., Cazzoli S., García-Lorenzo B. "Absence of nuclear polycyclic aromatic hydrocarbon emission from a compact starburst: The case of the type-2 quasar Mrk 477" Astronomy and Astrophysics, 669, art. no. L5

Alonso Herrero A., García-Burillo S., Pereira-Santaella M., Shimizu T., Combes F., Hicks E.K.S., Davies R., Ramos Almeida C., García-Bernete I., Hönig S.F., Levenson N.A., Packham C., Bellocchi E., Hunt L.K., Imanishi M., Ricci C., Roche P. "AGN feedback in action in the molecular gas ring of the Seyfert galaxy NGC 7172" Astronomy and Astrophysics, 675, art. no. A88

Alonso R., Hoyer S., Deleuil M., Simon A.E., Beck M., Benz W., Florén H.-G., Guterman P., Borsato L., Brandeker A., Gandolfi D., Wilson T.G., Zingales T., Alibert Y., Anglada G., Bárczy T., Barrado Navascues D., Barros S.C.C., Baumjohann W., Beck T., Billot N., Bonfils X., Broeg Ch., Charnoz S., Cameron A.C., van Damme C.C., Csizmadia S., Cubillos P.E., Davies M.B., Deline A., Delrez L., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Fortier A., Fossati L., Fridlund M., Gillon M., Güdel M., Günther M.N., Heitzmann A., Helling C., Isaak K.G., Kiss L.L., Kopp E., Lam K.W.F., Laskar J., Lecavelier des Étangs A., Lendl M., Magrin D., Maxted P.F.L., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Smith A.M.S., Sousa S.G., Stalport M., Szabó G.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Venturini J., Verrecchia F., Walton N.A. "No random transits in CHEOPS observations of HD 139139*,**" Astronomy and Astrophysics, 680, art. no. A78

Álvarez-Márquez J., Crespo Gómez A., Colina L., Neeleman M., Walter F., Labiano A., Pérez-González P., Bik A., Noorgaard-Nielsen H.U., Ostlin G., Wright G., Alonso-Herrero A., Azollini R., Caputi K.I., Eckart A., Le Fèvre O., García-Marín M., Greve T.R., Hjorth J., Ilbert O., Kendrew S., Pye J.P., Tikkanen T., Topinka M., Van Der Werf P., Ward M., Van Dishoeck E.F., Güdel M., Henning T., Lagage P.O., Ray T., Waelkens C. "MIRI/JWST observations reveal an extremely obscured starburst in the z = 6.9 system SPT0311-58" Astronomy and Astrophysics, 671, art. no. A105

Álvarez-Márquez J., Labiano A., Guillard P., Dicken D., Argyriou I., Patapis P., Law D.R., Kavanagh P.J., Larson K.L., Gasman D., Mueller M., Alberts S., Brandl B.R., Colina L., García-Marín M., Jones O.C., Noriega-Crespo A., Shivaei I., Temim T., Wright G.S. "Nuclear high-ionisation outflow in the Compton-thick AGN NGC 6552 as seen by the JWST mid-infrared instrument" Astronomy and Astrophysics, 672, art. no. A108

Amazo-Gómez E.M., Alvarado-Gómez J.D., Poppenhäger K., Hussain G.A.J., Wood B.E., Drake J.J., Do Nascimento J.-D., Anthony F., Sanz-Forcada J., Stelzer B., Del Sordo F., Damasso M., Redfield S., Donati J.F., König P.C., Hébrard G., Miles-Páez P.A. "Far beyond the Sun - II. Probing the stellar magnetism of the young Sun ι Horologii from the photosphere to its corona" Monthly Notices of the Royal Astronomical Society, 524 (4), pp. 5725 – 5748

Ambrosch M., Guiglion G., Mikolaitis S., Chiappini C., Tautvaisiene G., Nepal S., Gilmore G., Randich S., Bensby T., Bayo A., Bergemann M., Morbidelli L., Pancino E., Sacco G.G., Smiljanic R., Zaggia S., Jofré P., Jiménez-Esteban F.M. "The Gaia -ESO Survey: Chemical evolution of Mg and Al in the Milky Way with machine learning" Astronomy and Astrophysics, 672, art. no. A46

Amils R., Escudero C., Oggerin M., Puente Sánchez F., Arce Rodríguez A., Fernández Remolar D., Rodríguez N., García Villadangos M., Sanz J.L., Briones C., Sánchez-Román M., Gómez F., Leandro T., Moreno-Paz M., Prieto-Ballesteros O., Molina A., Tornos F., Sánchez-Andrea I., Timmis K., Pieper D.H., Parro V. "Coupled C, H, N, S and Fe biogeochemical cycles operating in the continental deep subsurface of the Iberian Pyrite Belt" Environmental Microbiology, 25 (2), pp. 428 – 453

Annunziatella M., Pérez-González P.G., Argumánez Á.G., Barro G., Pampliega B.A., Costantin L., Koekemoer A.M., Mérida R.M. "Lack of influence of the environment in the earliest stages of massive galaxy formation" Monthly Notices of the Royal Astronomical Society, 519 (1), pp. 1476 – 1493

Annunziatella M., Sajina A., Stefanon M., Marchesini D., Lacy M., Labbé I., Houston L., Bezanson R., Egami E., Fan X., Farrah D., Greene J., Goulding A., Lin Y.-T., Liu X., Moutard T., Ono Y., Ouchi M., Sawicki M., Surace J., Whitaker K. "The Spitzer Coverage of HSC-Deep with IRAC for Z studies (SHIRAZ). I. IRAC Mosaics" Astronomical Journal, 166 (1), art. no. 25

Ansín T., Gamen R., Morrell N.I., Barbá R.H., Maíz Apellániz J., Arias J.I., Simón-Díaz S., Holgado G. "Fundamental parameters of two O9-Type giant stars: The (former) spectral classification standard HD 93249 A and ALS 12502 A" Monthly Notices of the Royal Astronomical Society, 525 (3), pp. 4566 – 4580

Arenou F., Babusiaux C., Barstow M.A., Faigler S., Jorissen A., Kervella P., Mazeh T., Mowlavi N., Panuzzo P., Sahlmann J., Shahaf S., Sozzetti A., Bauchet N., Damerdji Y., Gavras P., Giacobbe P., Gosset E., Halbwachs J.-L., Holl B., Lattanzi M.G., Leclerc N., Morel T., Pourbaix D., Fiorentin P.Re., Sadowski G., Ségransan D., Siopis C., Teyssier D., Zwitter T., Planquart L., Brown A.G.A., Vallenari A., Prusti T., de Bruijne J.H.J., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., van Leeuwen F., Bakker J., Cacciari C., Castañeda J., De Angeli F., Fabricius C., Fouesneau M., Frémat Y., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Nicolas C., Nienartowicz K., Pailler F., Riclet F., Roux W., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Altmann M., Andrae R., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Davidson M., de Teodoro P., Nuñez Campos M., Delchambre L., Dell'Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Haigron R., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Janßen K., Jevardat de Fombelle G., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Reylé C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Smith M., Utrilla E., van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Anglada Varela E., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Bartolomé S., Bassilana J.-L., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Blazere A., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., de Laverny P., De Luise F., De March R., De Ridder J., de Souza R., de Torres A., del Peloso E.F., del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gerlach E., Geyer R., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hilger T., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-Antoine Piccolo A., Jiménez-Arranz Ó., Juaristi Campillo J., Julbe F., Karbevska L., Khanna S., Kordopatis G., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Madrero Pardo P., Magdaleno Romeo A., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Marcos Santos M.M.S., Marín Pina D., Marinoni S., Marocco F., Marshall D.J., Martin Polo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Peñalosa Esteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Regibo S., Richards P.J., Rios Diaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sáez Núñez A., Sagristà Sellés A., Salguero E., Samaras N., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Semeux D., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Torralba Elipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., van Dillen E., van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S. “Gaia Data Release 3: Stellar multiplicity, a teaser for the hidden treasure” Astronomy and Astrophysics, 674, art. no. A34

Argyriou I., Glasse A., Law D.R., Labiano A., Álvarez-Márquez J., Patapis P., Kavanagh P.J., Gasman D., Mueller M., Larson K., Vandenbussche B., Glauser A.M., Royer P., Dicken D., Harkett J., Sargent B.A., Engesser M., Jones O.C., Kendrew S., Noriega-Crespo A., Brandl B., Rieke G.H., Wright G.S., Lee D., Wells M. “JWST MIRI flight performance: The Medium-Resolution Spectrometer” Astronomy and Astrophysics, 675, art. no. A111

Argyriou I., Lage C., Rieke G.H., Gasman D., Bouwman J., Morrison J., Libralato M., Dicken D., Brandl B.R., Álvarez-Márquez J., Labiano A., Regan M., Ressler M.E. “The brighter-fatter effect in the JWST MIRI Si:As IBC detectors I. Observations, impact on science, and modelling” Astronomy and Astrophysics, 680, art. no. A96

Ariza-Mateos A., Briones C., Perales C., Bayo-Jiménez M.T., Domingo E., Gómez J. "Viruses as archaeological tools for uncovering ancient molecular relationships" Annals of the New York Academy of Sciences, 1529 (1), pp. 3 – 13

Armstrong D.J., Osborn A., Adibekyan V., Delgado-Mena E., Hojjatpanah S., Howell S.B., Hoyer S., Knierim H., Sousa S.G., Stassun K.G., Veras D., Anderson D.R., Bayliss D., Bouchy F., Burke C.J., Christiansen J.L., Dumusque X., Keniger M.A.F., Hadjigeorghiou A., Hawthorn F., Helled R., Jenkins J.M., Latham D.W., Lillo-Box J., Nielsen L.D., Osborn H.P., Rodrigues J., Rodriguez D., Santos N.C., Seager S., Strøm P.A., Torres G., Twicken J.D., Udry S., Wheatley P.J., Winn J.N. "Discovery and characterization of two Neptune-mass planets orbiting HD 212729 with TESS" Monthly Notices of the Royal Astronomical Society, 524 (4), pp. 5804 – 5816

Arrabal Haro P., Dickinson M., Finkelstein S.L., Fujimoto S., Fernández V., Kartaltepe J.S., Jung I., Cole J.W., Burgarella D., Chworowsky K., Hutchison T.A., Morales A.M., Papovich C., Simons R.C., Amorín R.O., Backhaus B.E., Bagley M.B., Bisigello L., Calabrò A., Castellano M., Cleri N.J., Davé R., Dekel A., Ferguson H.C., Fontana A., Gawiser E., Giavalisco M., Harish S., Hathi N.P., Hirschmann M., Holwerda B.W., Huertas-Company M., Koekemoer A.M., Larson R.L., Lucas R.A., Mobasher B., Pérez-González P.G., Pirzkal N., Rose C., Santini P., Trump J.R., de la Vega A., Wang X., Weiner B.J., Wilkins S.M., Yang G., Yung L.Y.A., Zavala J.A. "Spectroscopic Confirmation of CEERS NIRCam-selected Galaxies at $z\simeq8$-10" Astrophysical Journal Letters, 951 (1), art. no. L22

Arrabal Haro P., Dickinson M., Finkelstein S.L., Kartaltepe J.S., Donnan C.T., Burgarella D., Carnall A.C., Cullen F., Dunlop J.S., Fernández V., Fujimoto S., Jung I., Krips M., Larson R.L., Papovich C., Pérez-González P.G., Amorín R.O., Bagley M.B., Buat V., Casey C.M., Chworowsky K., Cohen S.H., Ferguson H.C., Giavalisco M., Huertas-Company M., Hutchison T.A., Kocevski D.D., Koekemoer A.M., Lucas R.A., McLeod D.J., McLure R.J., Pirzkal N., Seillé L.-M., Trump J.R., Weiner B.J., Wilkins S.M., Zavala J.A. "Confirmation and refutation of very luminous galaxies in the early Universe" Nature, 622 (7984), pp. 707 – 711

Azua-Bustos A., Fairén A.G., González-Silva C., Prieto-Ballesteros O., Carrizo D., Sánchez-García L., Parro V., Fernández-Martínez M.Á., Escudero C., Muñoz-Iglesias V., Fernández-Sampedro M., Molina A., Villadangos M.G., Moreno-Paz M., Wierzchos J., Ascaso C., Fornaro T., Brucato J.R., Poggiali G., Manrique J.A., Veneranda M., López-Reyes G., Sanz-Arranz A., Rull F., Ollila A.M., Wiens R.C., Reyes-Newell A., Clegg S.M., Millan M., Johnson S.S., McIntosh O., Szopa C., Freissinet C., Sekine Y., Fukushi K., Morida K., Inoue K., Sakuma H., Rampe E. "Dark microbiome and extremely low organics in Atacama fossil delta unveil Mars life detection limits" Nature Communications, 14 (1), art. no. 808

Bagley M.B., Finkelstein S.L., Koekemoer A.M., Ferguson H.C., Haro P.A., Dickinson M., Kartaltepe J.S., Papovich C., Pérez-González P.G., Pirzkal N., Somerville R.S., Willmer C.N.A., Yang G., Aaron Yung L.Y., Fontana A., Grazian A., Grogin N.A., Hirschmann M., Kewley L.J., Kirkpatrick A., Kocevski D.D., Lotz J.M., Medrano A., Morales A.M., Pentericci L., Ravindranath S., Trump J.R., Wilkins S.M., Calabrò A., Cooper M.C., Costantin L., de la Vega A., Hilbert B., Hutchison T.A., Larson R.L., Lucas R.A., McGrath E.J., Ryan R., Wang X., Wuyts S. "CEERS Epoch 1 NIRCam Imaging: Reduction Methods and Simulations Enabling Early JWST Science Results" Astrophysical Journal Letters, 946 (1), art. no. L12

Bailer-Jones C.A.L., Teyssier D., Delchambre L., Ducourant C., Garabato D., Hatzidimitriou D., Klioner S.A., Rimoldini L., Bellas-Velidis I., Carballo R., Carnerero M.I., Diener C., Fouesneau M., Galluccio L., Gavras P., Krone-Martins A., Raiteri C.M., Teixeira R., Brown A.G.A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., Van Leeuwen F., Bakker J., Cacciari C., Castañeda J., De Angeli F., Fabricius C., Frémat Y., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Altmann M., Andrae R., Audard M., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Nuñez Campos M., Dell Oro A., Esquej P., Fernández-Hernández J., Fraile E., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., Janen K., Jevardat De Fombelle G., Jordan S., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Reylé C., Riello M., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anderson R.I., Anglada Varela E., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carlucci T., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., De Laverny P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Diakite S., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hilger T., Håadczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-Antoine Piccolo A., Jiménez-Arranz Ã., Juaristi Campillo J., Julbe F., Karbevska L., Kervella P., Khanna S., Kontizas M., Kordopatis G., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszyåska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Madrero Pardo P., Magdaleno Romeo A., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Marcos Santos M.M.S., Marín Pina D., Marinoni S., Marocco F., Marshall D.J., Martin Polo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Peñalosa Esteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Rios Diaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Salguero E., Samaras N., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Tolomei L., Tonello N., Torra F., Torra J., Torralba Elipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., Van Dillen E., Van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. "Gaia Data Release 3: The extragalactic content" Astronomy and Astrophysics, 674, art. no. A41

Balcha E.S., Gómez F., Gemeda M.T., Bekele F.B., Abera S., Cavalazzi B., Woldesemayat A.A. "Shotgun Metagenomics-Guided Prediction Reveals the Metal Tolerance and Antibiotic Resistance of Microbes in Poly-Extreme Environments in the Danakil Depression, Afar Region" Antibiotics, 12 (12), art. no. 1697

Balsalobre-Ruza O., De Gregorio-Monsalvo I., Lillo-Box J., Huélamo N., Ribas Á., Benisty M., Bae J., Facchini S., Teague R. "Tentative co-orbital submillimeter emission within the Lagrangian region L 5of the protoplanet PDS 70 b" Astronomy and Astrophysics, 675, art. no. A172

Balsalobre-Ruza O., Lillo-Box J., Berihuete A., Silva A.M., Santos N.C., Castro-González A., Faria J.P., Huélamo N., Barrado D., Demangeon O.D.S., Marfil E., Aceituno J., Adibekyan V., Azzaro M., Barros S.C.C., Bergond G., Galadí-Enríquez D., Pedraz S., Santerne A. "KOBEsim: A Bayesian observing strategy algorithm for planet detection in radial velocity blind-search surveys*" Astronomy and Astrophysics, 669, art. no. A18

Barnes A.T., Liu J., Zhang Q., Tan J.C., Bigiel F., Caselli P., Cosentino G., Fontani F., Henshaw J.D., Jiménez-Serra I., Kalb D.-S., Law C.Y., Longmore S.N., Parker R.J., Pineda J.E., Sánchez-Monge A., Lim W., Wang K. "Mother of dragons: A massive, quiescent core in the dragon cloud (IRDC G028.37+00.07)" Astronomy and Astrophysics, 675, art. no. A53

Barrado D., Mollière P., Patapis P., Min M., Tremblin P., Ardevol Martinez F., Whiteford N., Vasist M., Argyriou I., Samland M., Lagage P.-O., Decin L., Waters R., Henning T., Morales-Calderón M., Guedel M., Vandenbussche B., Absil O., Baudoz P., Boccaletti A., Bouwman J., Cossou C., Coulais A., Crouzet N., Gastaud R., Glasse A., Glauser A.M., Kamp I., Kendrew S., Krause O., Lahuis F., Mueller M., Olofsson G., Pye J., Rouan D., Royer P., Scheithauer S., Waldmann I., Colina L., van Dishoeck E.F., Ray T., Östlin G., Wright G. "15NH3 in the atmosphere of a cool brown dwarf" Nature, 624 (7991), pp. 263 – 266

Barragán O., Gillen E., Aigrain S., Meech A., Klein B., Nielsen L.D., Yu H., O'Sullivan N.K., Nicholson B.A., Lillo-Box J. "Revisiting K2-233 spectroscopic time-series with multidimensional Gaussian processes" Monthly Notices of the Royal Astronomical Society, 522 (3), pp. 3458 – 3471

Barret D., Albouys V., Herder J.-W., Piro L., Cappi M., Huovelin J., Kelley R., Mas-Hesse J.M., Paltani S., Rauw G., Rozanska A., Svoboda J., Wilms J., Yamasaki N., Audard M., Bandler S., Barbera M., Barcons X., Bozzo E., Ceballos M.T., Charles I., Costantini E., Dauser T., Decourchelle A., Duband L., Duval J.-M., Fiore F., Gatti F., Goldwurm A., Hartog R., Jackson B., Jonker P., Kilbourne C., Korpela S., Macculi C., Mendez M., Mitsuda K., Molendi S., Pajot F., Pointecouteau E., Porter F., Pratt G.W., Prêle D., Ravera L., Sato K., Schaye J., Shinozaki K., Skup K., Soucek J., Thibert T., Vink J., Webb N., Chaoul L., Raulin D., Simionescu A., Torrejon J.M., Acero F., Branduardi-Raymont G., Ettori S., Finoguenov A., Grosso N., Kaastra J., Mazzotta P., Miller J., Miniutti G., Nicastro F., Sciortino S., Yamaguchi H., Beaumont S., Cucchetti E., D'Andrea M., Eckart M., Ferrando P., Kammoun E., Lotti S., Mesnager J.-M., Natalucci L., Peille P., de Plaa J., Ardellier F., Argan A., Bellouard E., Carron J., Cavazzuti E., Fiorini M., Khosropanah P., Martin S., Perry J., Pinsard F., Pradines A., Rigano M., Roelfsema P., Schwander D., Torrioli G., Ullom J., Vera I., Villegas E.M., Zuchniak M., Brachet F., Cicero U.L., Doriese W., Durkin M., Fioretti V., Geoffray H., Jacques L., Kirsch C., Smith S., Adams J., Gloaguen E., Hoogeveen R., van der Hulst P., Kiviranta M., van der Kuur J., Ledot A., van Leeuwen B.-J., van Loon D., Lyautey B., Parot Y., Sakai K., van Weers H., Abdoelkariem S., Adam T., Adami C., Aicardi C., Akamatsu H., Alonso P.E.M., Amato R., André J., Angelinelli M., Anon-Cancela M., Anvar S., Atienza R., Attard A., Auricchio N., Balado A., Bancel F., Barusso L.F., Bascuñan A., Bernard V., Berrocal A., Blin S., Bonino D., Bonnet F., Bonny P., Boorman P., Boreux C., Bounab A., Boutelier M., Boyce K., Brienza D., Bruijn M., Bulgarelli A., Calarco S., Callanan P., Campello A.P., Camus T., Canourgues F., Capobianco V., Cardiel N., Castellani F., Cheatom O., Chervenak J., Chiarello F., Clerc L., Clerc N., Cobo B., Coeur-Joly O., Coleiro A., Colonges S., Corcione L., Coriat M., Coynel A., Cuttaia F., D'Ai A., D'anca F., Dadina M., Daniel C., Dauner L., DeNigris N., Dercksen J., DiPirro M., Doumayrou E., Dubbeldam L., Dupieux M., Dupourqué S., Durand J.L., Eckert D., Eiriz V., Ercolani E., Etcheverry C., Finkbeiner F., Fiocchi M., Fossecave H., Franssen P., Frericks M., Gabici S., Gant F., Gao J.-R., Gastaldello F., Genolet L., Ghizzardi S., Gil M.A.A., Giovannini E., Godet O., Gomez-Elvira J., Gonzalez R., Gonzalez M., Gottardi L., Granat D., Gros M., Guignard N., Hieltjes P., Hurtado A.J., Irwin K., Jacquey C., Janiuk A., Jaubert J., Jiménez M., Jolly A., Jourdan T., Julien S., Kedziora B., Korb A., Kreykenbohm I., König O., Langer M., Laudet P., Laurent P., Laurenza M., Lesrel J., Ligori S., Lorenz M., Luminari A., Maffei B., Maisonnave O., Marelli L., Massonet D., Maussang I., Melchor A.G., Le Mer I., Millan F.J.S., Millerioux J.-P., Mineo T., Minervini G., Molin A., Monestes D., Montinaro N., Mot B., Murat D., Nagayoshi K., Nazé Y., Noguès L., Pailot D., Panessa F., Parodi L., Petit P., Piconcelli E., Pinto C., Plaza J.M.E., Plaza B., Poyatos D., Prouvé T., Ptak A., Puccetti S., Puccio E., Ramon P., Reina M., Rioland G., Rodriguez L., Roig A., Rollet B., Roncarelli M., Roudil G., Rudnicki T., Sanisidro J., Sciortino L., Silva V., Sordet M., Soto-Aguilar J., Spizzi P., Surace C., Sánchez M.F., Taralli E., Terrasa G., Terrier R., Todaro M., Ubertini P., Uslenghi M., de Vaate J.G.B., Vaccaro D., Varisco S., Varnière P., Vibert L., Vidriales M., Villa F., Vodopivec B.M., Volpe A., de Vries C., Wakeham N., Walmsley G., Wise M., de Wit M., Woźniak G. "The Athena X-ray Integral Field Unit: a consolidated design for the system requirement review of the preliminary definition phase" Experimental Astronomy, 55 (2), pp. 373 – 426

Barros S.C.C., Demangeon O.D.S., Armstrong D.J., Delgado Mena E., Acuña L., Fernández Fernández J., Deleuil M., Collins K.A., Howell S.B., Ziegler C., Adibekyan V., Sousa S.G., Stassun K.G., Grieves N., Lillo-Box J., Hellier C., Wheatley P.J., Briceño C., Collins K.I., Hawthorn F., Hoyer S., Jenkins J., Law N., Mann A.W., Matson R.A., Mousis O., Nielsen L.D., Osborn A., Osborn H., Paegert M., Papini R., Ricker G.R., Rudat A.A., Santos N.C., Seager S., Stockdale C., Strøm P.A., Twicken J.D., Udry S., Wang G., Vanderspek R., Winn J.N. "The young mini-Neptune HD 207496b that is either a naked core or on the verge of becoming one" Astronomy and Astrophysics, 673, art. no. A4

Basapathi Raghavendra J., Mathanlal T., Zorzano M.-P., Martin-Torres J. "An Optimized Active Sampling Procedure for Aerobiological DNA Studies" Sensors, 23 (5), art. no. 2836

Basapathi Raghavendra J., Zorzano M.-P., Kumaresan D., Martin-Torres J. "DNA sequencing at the picogram level to investigate life on Mars and Earth" Scientific Reports, 13 (1), art. no. 15277

Bellocchi E., Martín-Pintado J., Rico-Villas F., Martín S., Jiménez-Sierra I. "Positive feedback, quenching, and sequential super star cluster (SSC) formation in NGC 4945" Monthly Notices of the Royal Astronomical Society: Letters, 519 (1), pp. L68 - L73

Bello-García A., Passegger V.M., Ordieres-Meré J., Schweitzer A., Caballero J.A., González-Marcos A., Ribas I., Reiners A., Quirrenbach A., Amado P.J., Béjar V.J.S., Cifuentes C., Henning T., Kaminski A., Luque R., Montes D., Morales J.C., Pedraz S., Tabernero H.M., Zechmeister M. "The CARMENES search for exoplanets around M dwarfs: A deep transfer learning method to determine Teffand [M/H] of target stars" Astronomy and Astrophysics, 673, art. no. A105

Berlanas S.R., Maíz Apellániz J., Herrero A., Mahy L., Blomme R., Negueruela I., Dorda R., Comerón F., Gosset E., Pantaleoni González M., Molina Lera J.A., Sota A., Furst T., Alfaro E.J., Bergemann M., Carraro G., Drew J.E., Morbidelli L., Vink J.S. "Gaia-ESO survey: Massive stars in the Carina Nebula: I. A new census of OB stars" Astronomy and Astrophysics, 671, art. no. A20

Bernini-Peron M., Marcolino W.L.F., Sander A.A.C., Bouret J.-C., Ramachandran V., Saling J., Schneider F.R.N., Oskinova L.M., Najarro F. “Clumping and X-rays in cooler B supergiant stars” Astronomy and Astrophysics, 677, art. no. A50

Beuther H., Van Dishoeck E.F., Tychoniec L., Gieser C., Kavanagh P.J., Perotti G., Van Gelder M.L., Klaassen P., Caratti O Garatti A., Francis L., Rocha W.R.M., Slavicinska K., Ray T., Justtanont K., Linnartz H., Waelkens C., Colina L., Greve T., Güdel M., Henning T., Lagage P.-O., Vandenbussche B., Östlin G., Wright G. “JWST Observations of Young protoStars (JOYS): Outflows and accretion in the high-mass star-forming region IRAS 23385+6053” Astronomy and Astrophysics, 673, art. no. A121

Bing L., Béthermin M., Lagache G., Adam R., Ade P., Ajeddig H., André P., Artis E., Aussel H., Beelen A., Benoît A., Berta S., Billot N., Bourrion O., Calvo M., Catalano A., De Petris M., Désert F.-X., Doyle S., Driessen E.F.C., Elbaz D., Gkogkou A., Gomez A., Goupy J., Hanser C., Kéruzoré F., Kramer C., Ladjelate B., Liu D., Leclercq S., Lestrade J.-F., Lustig P., MacÍas-Pérez J.F., Maury A., Mauskopf P., Mayet F., Monfardini A., Muñoz-Echeverría M., Perotto L., Pisano G., Ponthieu N., Revéret V., Rigby A.J., Ritacco A., Romero C., Roussel H., Ruppin F., Schuster K., Sievers A., Tucker C., Zylka R. “NIKA2 Cosmological Legacy Survey: Survey description and galaxy number counts” Astronomy and Astrophysics, 677

Bisigello L., Gandolfi G., Grazian A., Rodighiero G., Costantin L., Cooray A.R., Feltre A., Gruppioni C., Hathi N.P., Holwerda B.W., Koekemoer A.M., Lucas R.A., Newman J.A., Pérez-González P.G., Yung L.Y.A., De La Vega A., Arrabal Haro P., Bagley M.B., Dickinson M., Finkelstein S.L., Kartaltepe J.S., Papovich C., Pirzkal N., Wilkins S. “Delving deep: A population of extremely dusty dwarfs observed by JWST” Astronomy and Astrophysics, 676, art. no. A76

Björklund R., Sundqvist J.O., Singh S.M., Puls J., Najarro F. “New predictions for radiation-driven, steady-state mass-loss and wind-momentum from hot, massive stars: III. Updated mass-loss rates for stellar evolution” Astronomy and Astrophysics, 676, art. no. A109

Blanco-Pozo J., Perger M., Damasso M., Anglada Escudé G., Ribas I., Baroch D., Caballero J.A., Cifuentes C., Jeffers S.V., Lafarga M., Kaminski A., Kaur S., Nagel E., Perdelwitz V., Pérez-Torres M., Sozzetti A., Viganò D., Amado P.J., Andreuzzi G., Béjar V.J.S., Brown E.L., Del Sordo F., Dreizler S., Galadí-Enríquez D., Hatzes A.P., Kürster M., Lanza A.F., Melis A., Molinari E., Montes D., Murgia M., Pallé E., Peña-Moñino L., Perrodin D., Pilia M., Poretti E., Quirrenbach A., Reiners A., Schweitzer A., Zapatero Osorio M.R., Zechmeister M. “The CARMENES search for exoplanets around M dwarfs: A long-period planet around GJ 1151 measured with CARMENES and HARPS-N data” Astronomy and Astrophysics, 671, art. no. A50

Bodensteiner J., Sana H., Dufton P.L., Wang C., Langer N., Banyard G., Mahy L., De Koter A., De Mink S.E., Evans C.J., Götberg Y., Hénault-Brunet V., Patrick L.R., Schneider F.R.N. "The young massive SMC cluster NGC 330 seen by MUSE: III. Stellar parameters and rotational velocities" Astronomy and Astrophysics, 680, art. no. A32

Böker T., Beck T.L., Birkmann S.M., Giardino G., Keyes C., Kumari N., Muzerolle J., Rawle T., Zeidler P., Abul-Huda Y., de Oliveira C.A., Arribas S., Bechtold K., Bhatawdekar R., Bonaventura N., Bunker A.J., Cameron A.J., Carniani S., Charlot S., Curti M., Espinoza N., Ferruit P., Franx M., Jakobsen P., Karakla D., López-Caniego M., Lützgendorf N., Maiolino R., Manjavacas E., Marston A.P., Moseley S.H., Ogle P., Perna M., Peña-Guerrero M., Pirzkal N., Plesha R., Proffitt C.R., Rauscher B.J., Rix H.-W., del Pino B.R., Rustamkulov Z., Sabbi E., Sing D.K., Sirianni M., Plate M.T., Úbeda L., Wahlgren G.M., Wislowski E., Wu R., Willott C.J. "In-orbit Performance of the Near-infrared Spectrograph NIRSpec on the James Webb Space Telescope" Publications of the Astronomical Society of the Pacific, 135 (1045), art. no. 038001

Boldog Á., Szabó G.M., Kriskovics L., Brandeker A., Kiefer F., Bekkelien A., Guterman P., Olofsson G., Simon A.E., Gandolfi D., Serrano L.M., Wilson T.G., Sousa S.G., Lecavelier Des Etangs A., Alibert Y., Alonso R., Anglada G., Bandy T., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Bonfils X., Broeg C., Buder M., Cabrera J., Charnoz S., Collier Cameron A., Corral Van Damme C., Csizmadia S., Davies M.B., Deline A., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Farinato J., Fortier A., Fossati L., Fridlund M., Gillon M., Güdel M., Heng K., Hoyer S., Isaak K.G., Kiss L.L., Laskar J., Lendl M., Lovis C., Magrin D., Maxted P.F.L., Mecina M., Nascimbeni V., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Smith A.M.S., Steller M., Thomas N., Udry S., Van Grootel V., Walton N.A. "Glancing through the debris disk: Photometric analysis of de Boo with CHEOPS" Astronomy and Astrophysics, 671, art. no. A127

Bonaccorsi R., Glass B., Moreno-Paz M., García-Villadangos M., Warren-Rhodes K., Parro V., Manchado J.M., Wilhelm M.B., McKay C.P. "In Situ Real-Time Monitoring for Aseptic Drilling: Lessons Learned from the Atacama Rover Astrobiology Drilling Studies Contamination Control Strategy and Implementation and Application to the Icebreaker Mars Life Detection Mission" Astrobiology, 23 (12), pp. 1303 – 1336

Bonaventura N., Jakobsen P., Ferruit P., Arribas S., Giardino G. "The Near-Infrared Spectrograph (NIRSpec) on the James Webb Space Telescope: V. Optimal algorithms for planning multi-object spectroscopic observations" Astronomy and Astrophysics, 672, art. no. A40

Bonfanti A., Gandolfi D., Egger J.A., Fossati L., Cabrera J., Krenn A., Alibert Y., Benz W., Billot N., Florén H.-G., Lendl M., Adibekyan V., Salmon S., Santos N.C., Sousa S.G., Wilson T.G., Barragán O., Collier Cameron A., Delrez L., Esposito M., Goffo E., Osborne H., Osborn H.P., Serrano L.M., Van Eylen V., Alarcon J., Alonso R., Anglada G., Bárczy T., Barrado Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Bedell M., Bonfils X., Borsato L., Brandeker A., Broeg C., Charnoz S., Corral Van Damme C., Csizmadia S., Cubillos P.E., Davies M.B., Deleuil M., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Fortier A., Fridlund M., Gillon M., Güdel M., Hoyer S., Isaak K.G., Kerschbaum F., Kiss L.L., Laskar J., Lecavelier Des Etangs A., Lorenzo-Oliveira D., Lovis C., Magrin D., Marafatto L., Maxted P.F.L., Meléndez J., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piazza D., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Venturini J., Walton N.A. "TOI-1055 b: Neptunian planet characterised with HARPS, TESS, and CHEOPS" Astronomy and Astrophysics, 671, art. no. L8

Bouwman J., Kendrew S., Greene T.P., Bell T.J., Lagage P.-O., Schreiber J., Dicken D., Sloan G.C., Espinoza N., Scheithauer S., Coulais A., Fox O.D., Gastaud R., Glauser A.M., Jones O.C., Labiano A., Lahuis F., Morrison J.E., Murray K., Mueller M., Nayak O., Wright G.S., Glasse A., Rieke G. "Spectroscopic Time Series Performance of the Mid-infrared Instrument on the JWST" Publications of the Astronomical Society of the Pacific, 135 (1045), art. no. 038002

Britavskiy N., Simón-Díaz S., Holgado G., Burssens S., Maíz Apellániz J., Eldridge J.J., Nazé Y., Pantaleoni González M., Herrero A. "The IACOB project: VIII. Searching for empirical signatures of binarity in fast-rotating O-type stars" Astronomy and Astrophysics, 672, art. no. A22

Bujarrabal V., Alcolea J., Castro-Carrizo A., Kluska J., Sánchez Contreras C., Van Winckel H. "The very compact dust disk in the Red Rectangle" Astronomy and Astrophysics, 677, art. no. L18

Bunker A.J., Saxena A., Cameron A.J., Willott C.J., Curtis-Lake E., Jakobsen P., Carniani S., Smit R., Maiolino R., Witstok J., Curti M., D'eugenio F., Jones G.C., Ferruit P., Arribas S., Charlot S., Chevallard J., Giardino G., De Graaff A., Looser T.J., Lützgendorf N., Maseda M.V., Rawle T., Rix H.-W., Del Pino B.R., Alberts S., Egami E., Eisenstein D.J., Endsley R., Hainline K., Hausen R., Johnson B.D., Rieke G., Rieke M., Robertson B.E., Shivaei I., Stark D.P., Sun F., Tacchella S., Tang M., Williams C.C., Willmer C.N.A., Baker W.M., Baum S., Bhatawdekar R., Bowler R., Boyett K., Chen Z., Circosta C., Helton J.M., Ji Z., Kumari N., Lyu J., Nelson E., Parlanti E., Perna M., Sandles L., Scholtz J., Suess K.A., Topping M.W., Übler H., Wallace I.E.B., Whitler L. "JADES NIRSpec Spectroscopy of GN-z11: Lyman- α emission and possible enhanced nitrogen abundance in a z = 10.60 luminous galaxy" Astronomy and Astrophysics, 677, art. no. A88

Buttitta C., Corsini E.M., Aguerri J.A.L., Coccato L., Costantin L., Cuomo V., Debattista V.P., Morelli L., Pizzella A. "The bar rotation rate as a diagnostic of dark matter content in the centre of disc galaxies" Monthly Notices of the Royal Astronomical Society, 521 (2), pp. 2227 – 2238

Cabrera J., Gandolfi D., Serrano L.M., Csizmadia S., Egger J.A., Baumeister P., Krenn A., Benz W., Deline A., Florén H.-G., Collier Cameron A., Adibekyan V., Alibert Y., Bellomo S.E., Delrez L., Fossati L., Fortier A., Grziwa S., Hoyer S., Bonfanti A., Salmon S., Sousa S.G., Wilson T.G., Alarcón J., Alonso R., Anglada Escudé G., Bárczy T., Barragán O., Barrado D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Bernabò L.M., Billot N., Bonfils X., Borsato L., Brandeker A., Broeg C., Carrión-González O., Charnoz S., Ciardi D.R., Cochran W.D., Collins K.A., Collins K.I., Conti D.M., Davies M.B., Deeg H.J., Deleuil M., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Esposito M., Fridlund M., Gillon M., Goffo E., Güdel M., Guenther E.W., Harre J.-V., Heng K., Hooton M.J., Isaak K.G., Jenkins J.M., Kiss L.L., Knudstrup E., Lam K.W.F., Laskar J., Lecavelier Des Etangs A., Lendl M., Lovis C., Luque R., Magrin D., Maxted P.F.L., Muresan A., Nascimbeni V., Olofsson G., Osborn H.P., Osborne H.L.M., Ottensamer R., Pagano I., Pallé E., Persson C.M., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Redfield S., Ribas I., Ricker G.R., Rodler F., Santos N.C., Scandariato G., Seager S., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Tosi N., Twicken J.D., Udry S., Van Eylen V., Van Grootel V., Walton N.A., Winn J.N. "The planetary system around HD 190622 (TOI-1054): Measuring the gas content of low-mass planets orbiting F-stars" Astronomy and Astrophysics, 675, art. no. A183

Calabrò A., Pentericci L., Feltre A., Haro P.A., Radovich M., Seillé L.-M., Oliva E., Daddi E., Amorín R., Bagley M.B., Bisigello L., Buat V., Castellano M., Cleri N.J., Dickinson M., Fernández V., Finkelstein S.L., Giavalisco M., Grazian A., Hathi N.P., Hirschmann M., Juneau S., Kartaltepe J.S., Koekemoer A.M., Lucas R.A., Papovich C., Pérez-González P.G., Pirzkal N., Santini P., Trump J., De La Vega A., Wilkins S.M., Aaron Yung L.Y., Cassata P., Gobat R.A.S., Mascia S., Napolitano L., Vulcani B. "Near-infrared emission line diagnostics for AGN from the local Universe to z ∼ 3" Astronomy and Astrophysics, 679, art. no. A80

Cameron A.J., Saxena A., Bunker A.J., D'eugenio F., Carniani S., Maiolino R., Curtis-Lake E., Ferruit P., Jakobsen P., Arribas S., Bonaventura N., Charlot S., Chevallard J., Curti M., Looser T.J., Maseda M.V., Rawle T., Rodríguez Del Pino B., Smit R., Übler H., Willott C., Witstok J., Egami E., Eisenstein D.J., Johnson B.D., Hainline K., Rieke M., Robertson B.E., Stark D.P., Tacchella S., Williams C.C., Willmer C.N.A., Bhatawdekar R., Bowler R., Boyett K., Circosta C., Helton J.M., Jones G.C., Kumari N., Ji Z., Nelson E., Parlanti E., Sandles L., Scholtz J., Sun F. "JADES: Probing interstellar medium conditions at z ∼ 5.5-9.5 with ultra-deep JWST/NIRSpec spectroscopy" Astronomy and Astrophysics, 677, art. no. A115

Campante T.L., Li T., Ong J.M.J., Corsaro E., Cunha M.S., Bedding T.R., Bossini D., Breton S.N., Buzasi D.L., Chaplin W.J., Deal M., García R.A., Hill M.L., Hon M., Huber D., Jiang C., Kane S.R., Kayhan C., Kuszlewicz J.S., Lillo-Box J., Mathur S., Monteiro M.J.P.F.G., Pereira F., Santos N.C., Serenelli A., Stello D. "Revisiting the Red Giant Branch Hosts KOI-3886 and ι Draconis. Detailed Asteroseismic Modeling and Consolidated Stellar Parameters" Astronomical Journal, 165 (5), art. no. 214

Carrascosa H., Satorre M.A., Escribano B., Martín-Domenech R., Muñoz Caro G.M. “Physical properties of methanol (CH3OH) ice as a function of temperature: density, infrared band strengths, and crystallization” Monthly Notices of the Royal Astronomical Society, 525 (2), pp. 2690 – 2700

Castro-González A., Demangeon O.D.S., Lillo-Box J., Lovis C., Lavie B., Adibekyan V., Acuña L., Deleuil M., Aguichine A., Zapatero Osorio M.R., Tabernero H.M., Davoult J., Alibert Y., Santos N., Sousa S.G., Antoniadis-Karnavas A., Borsa F., Winn J.N., Allende Prieto C., Figueira P., Jenkins J.M., Sozzetti A., Damasso M., Silva A.M., Astudillo-Defru N., Barros S.C.C., Bonfils X., Cristiani S., Di Marcantonio P., González Hernández J.I., Curto G.L., Martins C.J.A.P., Nunes N.J., Palle E., Pepe F., Seager S., Suárez Mascareño A. “An unusually low-density super-Earth transiting the bright early-type M-dwarf GJ 1018 (TOI-244)” Astronomy and Astrophysics, 675, art. no. A52

Catalán P., Antonio García-Martín J., Aguirre J., Cuesta J.A., Manrubia S. “Entropic contribution to phenotype fitness” Journal of Physics A: Mathematical and Theoretical, 56 (34), art. no. 345601

Chide B., Jacob X., Petculescu A., Lorenz R.D., Maurice S., Seel F., Schröder S., Wiens R.C., Gillier M., Murdoch N., Lanza N.L., Bertrand T., Leighton T.G., Joseph P., Pilleri P., Mimoun D., Stott A., de la Torre Juarez M., Hueso R., Munguira A., Sánchez-Lavega A., Martinez G., Larmat C., Lasue J., Newman C., Pla-Garcia J., Bernardi P., Harri A.-M., Genzer M., Lepinette A. “Measurements of sound propagation in Mars' lower atmosphere” Earth and Planetary Science Letters, 615, art. no. 118200

Chiesa A., Roca S., Chicco S., De Ory M.C., Gómez-León A., Gomez A., Zueco D., Luis F., Carretta S. “Blueprint for a Molecular-Spin Quantum Processor” Physical Review Applied, 19 (6), art. no. 064060

Christensen L., Jakobsen P., Willott C., Arribas S., Bunker A., Charlot S., Maiolino R., Marshall M., Perna M., Übler H. “Metal enrichment and evolution in four z > 6.5 quasar sightlines observed with JWST/NIRSpec” Astronomy and Astrophysics, 680, art. no. A82

Clark J.S., Lohr M.E., Najarro F., Patrick L.R., Ritchie B.W. “The Arches cluster revisited - IV. Observational constraints on the binary properties of very massive stars” Monthly Notices of the Royal Astronomical Society, 521 (3), pp. 4473 – 4489

Clavé E., Benzerara K., Meslin P.-Y., Forni O., Royer C., Mandon L., Beck P., Quantin-Nataf C., Beyssac O., Cousin A., Bousquet B., Wiens R.C., Maurice S., Dehouck E., Schröder S., Gasnault O., Mangold N., Dromart G., Bosak T., Bernard S., Udry A., Anderson R.B., Arana G., Brown A.J., Castro K., Clegg S.M., Cloutis E., Fairén A.G., Flannery D.T., Gasda P.J., Johnson J.R., Lasue J., Lopez-Reyes G., Madariaga J.M., Manrique J.A., Mouélic S.L., Núñez J.I., Ollila A.M., Pilleri P., Pilorget C., Pinet P., Poulet F., Veneranda M., Wolf Z.U. "Carbonate Detection With SuperCam in Igneous Rocks on the Floor of Jezero Crater, Mars" Journal of Geophysical Research: Planets, 128 (6), art. no. e2022JE007463

Colina L., Crespo Gómez A., Álvarez-Márquez J., Bik A., Walter F., Boogaard L., Labiano A., Peissker F., Pérez-González P., Östlin G., Greve T.R., Nørgaard-Nielsen H.U., Wright G., Alonso-Herrero A., Azollini R., Caputi K.I., Dicken D., García-Marín M., Hjorth J., Ilbert O., Kendrew S., Pye J.P., Tikkanen T., Van Der Werf P., Costantin L., Iani E., Gillman S., Jermann I., Langeroodi D., Moutard T., Rinaldi P., Topinka M., Van Dishoeck E.F., Güdel M., Henning T., Lagage P.O., Ray T., Vandenbussche B. "Uncovering the stellar structure of the dusty star-forming galaxy GN20 at z?=?4.055 with MIRI/JWST" Astronomy and Astrophysics, 673, art. no. L6

Coogan R.T., Daddi E., Le Bail A., Elbaz D., Dickinson M., Giavalisco M., Gómez-Guijarro C., De La Vega A., Bagley M., Finkelstein S.L., Franco M., Cooray A.R., Behroozi P., Bisigello L., Casey C.M., Ciesla L., Dimauro P., Finoguenov A., Koekemoer A.M., Lucas R.A., Pérez-González P.G., Aaron Yung L.Y., Arrabal Haro P., Kartaltepe J.S., Jogee S., Papovich C., Pirzkal N., Wilkins S.M. "A z = 1.85 galaxy group in CEERS: Evolved, dustless, massive intra-halo light and a brightest group galaxy in the making" Astronomy and Astrophysics, 677, art. no. A3

Cortés-Contreras M., Solano E., Alonso-Hernández J., Cardiel N., Cruz P., Rodrigo C. "The Calar Alto CAFOS direct imaging first data release" Monthly Notices of the Royal Astronomical Society, 521 (2), pp. 3127 – 3149

Cosentino G., Tan J.C., Jiménez-Serra I., Fontani F., Caselli P., Henshaw J.D., Barnes A.T., Law C.-Y., Viti S., Fedriani R., Hsu C.-J., Gorai P., Zeng S. "Deuterium fractionation across the infrared-dark cloud G034.77-00.55 interacting with the supernova remnant W44" Astronomy and Astrophysics, 675, art. no. A190

Costantin L., Pérez-González P.G., Guo Y., Buttitta C., Jogee S., Bagley M.B., Barro G., Kartaltepe J.S., Koekemoer A.M., Cabello C., Corsini E.M., Méndez-Abreu J., de la Vega A., Iyer K.G., Bisigello L., Cheng Y., Morelli L., Arrabal Haro P., Buitrago F., Cooper M.C., Dekel A., Dickinson M., Finkelstein S.L., Giavalisco M., Holwerda B.W., Huertas-Company M., Lucas R.A., Papovich C., Pirzkal N., Seillé L.-M., Vega-Ferrero J., Wuyts S., Yung L.Y.A. "A Milky Way-like barred spiral galaxy at a redshift of 3" Nature, 623 (7987), pp. 499 – 501

Costantin L., Pérez-González P.G., Vega-Ferrero J., Huertas-Company M., Bisigello L., Buitrago F., Bagley M.B., Cleri N.J., Cooper M.C., Finkelstein S.L., Holwerda B.W., Kartaltepe J.S., Koekemoer A.M., Nelson D., Papovich C., Pillepich A., Pirzkal N., Tacchella S., Yung L.Y.A.

"Expectations of the Size Evolution of Massive Galaxies at 3 ≤ z ≤ 6 from the TNG50 Simulation: The CEERS/JWST View" Astrophysical Journal, 946 (2), art. no. 71

Coustenis A., Hedman N., Doran P.T., Al Shehhi O., Ammannito E., Fujimoto M., Grasset O., Groen F., Hayes A., Ilyin V., Kumar K P., Morisset C.-E., Mustin C., Olsson-Francis K., Peng J., Prieto Ballesteros O., Raulin F., Rettberg P., Sinibaldi S., Suzuki Y., Xu K., Zaitsev M. "Planetary protection: Updates and challenges for a sustainable space exploration" Acta Astronautica, 210, pp. 446 – 452

Coustenis A., Hedman N., Doran P.T., Al Shehhi O., Ammannito E., Fujimoto M., Grasset O., Groen F., Hayes A.G., Ilyin V., Kumar K.P., Morisset C.-E., Mustin C., Olsson-Francis K., Peng J., Prieto-Ballesteros O., Raulin F., Rettberg P., Sinibaldi S., Suzuki Y., Xu K., Zaitsev M. "Planetary protection: an international concern and responsibility" Frontiers in Astronomy and Space Sciences, 10, art. no. 1172546

Creevey O.L., Sarro L.M., Lobel A., Pancino E., Andrae R., Smart R.L., Clementini G., Heiter U., Korn A.J., Fouesneau M., Frémat Y., De Angeli F., Vallenari A., Harrison D.L., Thévenin F., Reylé C., Sordo R., Garofalo A., Brown A.G.A., Eyer L., Prusti T., de Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Ducourant C., Evans D.W., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., van Leeuwen F., Bakker J., Cacciari C., Castañeda J., Fabricius C., Galluccio L., Guerrier A., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Damerdji Y., Davidson M., de Teodoro P., Nuñez Campos M., Delchambre L., Dell'Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., Janßen K., de Fombelle G.J., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pauwels T., Recio-Blanco A., Riello M., Rimoldini L., Roegiers T., Rybizki J., Siopis C., Smith M., Sozzetti A., Utrilla E., van Leeuwen M., Abbas U., Ábrahám P., Aramburu A.A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Varela E.A., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., de Laverny P., De Luise F., De March R., De Ridder J., de Souza R., de Torres A., del Peloso E.F., del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Di Matteo P., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P.,

Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Hilger T., Sarmiento M.H., Hidalgo S.L., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Piccolo A.J.-A., Jiménez-Arranz Ó., Campillo J.J., Julbe F., Karbevska L., Kervella P., Khanna S., Kordopatis G., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lorca A., Loup C., Pardo P.M., Romeo A.M., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Santos M.M.S.M., Pina D.M., Marinoni S., Marocco F., Marshall D.J., Polo L.M., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Esteller X.P., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Diaz C.R., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Mieres D.R., Rybicki K.A., Sadowski G., Núñez A.S., Sellés A.S., Sahlmann J., Salguero E., Samaras N., Gimenez V.S., Sanna N., Santoveña R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Elipe G.T., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., van Dillen E., van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: A golden sample of astrophysical parameters” Astronomy and Astrophysics, 674, art. no. A39

Creevey O.L., Sordo R., Pailler F., Frémat Y., Heiter U., Thévenin F., Andrae R., Fouesneau M., Lobel A., Bailer-Jones C.A.L., Garabato D., Bellas-Velidis I., Brugaletta E., Lorca A., Ordenovic C., Palicio P.A., Sarro L.M., Delchambre L., Drimmel R., Rybizki J., Torralba Elipe G., Korn A.J., Recio-Blanco A., Schultheis M.S., De Angeli F., Montegriffo P., Abreu Aramburu A., Accart S., Álvarez M.A., Bakker J., Brouillet N., Burlacu A., Carballo R., Casamiquela L., Chiavassa A., Contursi G., Cooper W.J., Dafonte C., Dapergolas A., De Laverny P., Dharmawardena T.E., Edvardsson B., Le Fustec Y., García-Lario P., García-Torres M., Gomez A., González-Santamaría I., Hatzidimitriou D., Jean-Antoine Piccolo A., Kontiza M., Kordopatis G., Lanzafame A.C., Lebreton Y., Licata E.L., Lindstrøm H.E.P., Livanou E., Magdaleno Romeo A., Manteiga M., Marocco F., Marshall D.J., Mary N., Nicolas C., Pallas-Quintela L., Panem C., Pichon B., Poggio E., Riclet F., Robin C., Santoveña R., Silvelo A., Slezak I., Smart R.L., Soubiran C., Süveges M., Ulla A., Utrilla E., Vallenari A., Zhao H., Zorec J., Barrado D., Bijaoui A., Bouret J.-C., Blomme R., Brott I., Cassisi S., Kochukhov O., Martayan C., Shulyak D., Silvester J. “Gaia Data Release 3:

Astrophysical parameters inference system (Apsis). I. Methods and content overview" Astronomy and Astrophysics, 674, art. no. A26

Cresci G., Tozzi G., Perna M., Brusa M., Marconcini C., Marconi A., Carniani S., Brienza M., Giroletti M., Belfiore F., Ginolfi M., Mannucci F., Ulivi L., Scholtz J., Venturi G., Arribas S., Übler H., D'eugenio F., Mingozzi M., Balmaverde B., Capetti A., Parlanti E., Zana T. "Bubbles and outflows: The novel JWST/NIRSpec view of the z = 1.59 obscured quasar XID2028" Astronomy and Astrophysics, 672, art. no. A128

Cruz P., Cortés-Contreras M., Solano E., Rodrigo C., Minniti D., Alonso-García J., Saito R.K. "M dwarf stars in the b294 field from the VISTA Variables in the Vía Láctea (VVV)" Monthly Notices of the Royal Astronomical Society, 520 (3), pp. 4730 – 4739

Cueto-Díaz E.J., Castro Muñiz A., Suárez García F., Alkorta I., Valles González M.P., Mateo-Martí E. "Effect of Surface Organo-Silanization on SBA-15 Mesoporous Silicas in CO2 Adsorption Processes: Design, Synthesis, and Computational Studies" Industrial and Engineering Chemistry Research, 62 (28), pp. 11001 – 11015

Cueto-Díaz E.J., Gálvez-Martínez S., Colin-García M., Mateo-Martí E. "A New Approach in Prebiotic Chemistry Studies: Proline Sorption Triggered by Mineral Surfaces Analysed Using XPS" Life, 13 (4), art. no. 908

Curtis-Lake E., Carniani S., Cameron A., Charlot S., Jakobsen P., Maiolino R., Bunker A., Witstok J., Smit R., Chevallard J., Willott C., Ferruit P., Arribas S., Bonaventura N., Curti M., D'Eugenio F., Franx M., Giardino G., Looser T.J., Lützgendorf N., Maseda M.V., Rawle T., Rix H.-W., Rodríguez del Pino B., Übler H., Sirianni M., Dressler A., Egami E., Eisenstein D.J., Endsley R., Hainline K., Hausen R., Johnson B.D., Rieke M., Robertson B., Shivaei I., Stark D.P., Tacchella S., Williams C.C., Willmer C.N.A., Bhatawdekar R., Bowler R., Boyett K., Chen Z., de Graaff A., Helton J.M., Hviding R.E., Jones G.C., Kumari N., Lyu J., Nelson E., Perna M., Sandles L., Saxena A., Suess K.A., Sun F., Topping M.W., Wallace I.E.B., Whitler L. "Spectroscopic confirmation of four metal-poor galaxies at z = 10.3–13.2" Nature Astronomy, 7 (5), pp. 622 – 632

Czaja A.D., Zorzano M.-P., Kminek G., Meyer M.A., Beaty D.W., Sefton-Nash E., Carrier B.L., Thiessen F., Haltigin T., Bouvier A., Dauphas N., French K.L., Hallis L.J., Harris R.L., Hauber E., Rodriguez L.E., Schwenzer S.P., Steele A., Tait K.T., Thorpe M.T., Usui T., Vanhomwegen J., Velbel M.A., Edwin S., Farley K.A., Glavin D.P., Harrington A.D., Hays L.E., Hutzler A., Wadhwa M. "Report of the Science Community Workshop on the proposed First Sample Depot for the Mars Sample Return Campaign" Meteoritics and Planetary Science, 58 (6), pp. 885 – 896

D. Law D., E. Morrison J., Argyriou I., Patapis P., Álvarez-Márquez J., Labiano A., Vandenbussche B. "A 3D Drizzle Algorithm for JWST and Practical Application to the MIRI Medium Resolution Spectrometer" Astronomical Journal, 166 (2), art. no. 45

Daddaoua A., Álvarez C., Oggerin M., Rodriguez N., Duque E., Amils R., Armengaud J., Segura A., Ramos J.L. "Rio Tinto as a niche for acidophilus enzymes of industrial relevance" Microbial Biotechnology, 16 (5), pp. 1069 – 1086

Dai F., Schlaufman K.C., Reggiani H., Bouma L., Howard A.W., Chontos A., Pidhorodetska D., Van Zandt J., Akana Murphy J.M., Rubenzahl R.A., Polanski A.S., Lubin J., Beard C., Giacalone S., Holcomb R., Batalha N.M., Crossfield I., Dressing C., Fulton B., Huber D., Isaacson H., Kane S.R., Petigura E.A., Robertson P., Weiss L.M., Belinski A.A., Boyle A.W., Burke C.J., Castro-González A., Ciardi D.R., Daylan T., Fukui A., Gill H., Guerrero N.M., Hellier C., Howell S.B., Lillo-Box J., Murgas F., Narita N., Pallé E., Rodriguez D.R., Savel A.B., Shporer A., Stassun K.G., Striegel S., "A Mini-Neptune Orbiting the Metal-poor K Dwarf BD+29 2654" Astronomical Journal, 166 (2), art. no. 49

Daly R.T., Ernst C.M., Barnouin O.S., Chabot N.L., Rivkin A.S., Cheng A.F., Adams E.Y., Agrusa H.F., Abel E.D., Alford A.L., Asphaug E.I., Atchison J.A., Badger A.R., Baki P., Ballouz R.-L., Bekker D.L., Bellerose J., Bhaskaran S., Buratti B.J., Cambioni S., Chen M.H., Chesley S.R., Chiu G., Collins G.S., Cox M.W., DeCoster M.E., Ericksen P.S., Espiritu R.C., Faber A.S., Farnham T.L., Ferrari F., Fletcher Z.J., Gaskell R.W., Graninger D.M., Haque M.A., Harrington-Duff P.A., Hefter S., Herreros I., Hirabayashi M., Huang P.M., Hsieh S.-Y.W., Jacobson S.A., Jenkins S.N., Jensenius M.A., John J.W., Jutzi M., Kohout T., Krueger T.O., Laipert F.E., Lopez N.R., Luther R., Lucchetti A., Mages D.M., Marchi S., Martin A.C., McQuaide M.E., Michel P., Moskovitz N.A., Murphy I.W., Murdoch N., Naidu S.P., Nair H., Nolan M.C., Ormö J., Pajola M., Palmer E.E., Peachey J.M., Pravec P., Raducan S.D., Ramesh K.T., Ramirez J.R., Reynolds E.L., Richman J.E., Robin C.Q., Rodriguez L.M., Roufberg L.M., Rush B.P., Sawyer C.A., Scheeres D.J., Scheirich P., Schwartz S.R., Shannon M.P., Shapiro B.N., Shearer C.E., Smith E.J., Steele R.J., Steckloff J.K., Stickle A.M., Sunshine J.M., Superfin E.A., Tarzi Z.B., Thomas C.A., Thomas J.R., Trigo-Rodríguez J.M., Tropf B.T., Vaughan A.T., Velez D., Waller C.D., Wilson D.S., Wortman K.A., Zhang Y. "Successful kinetic impact into an asteroid for planetary defence" Nature, 616 (7957), pp. 443 – 447

Damasso M., Rodrigues J., Castro-González A., Lavie B., Davoult J., Zapatero Osorio M.R., Dou J., Sousa S.G., Owen J.E., Sossi P., Adibekyan V., Osborn H., Leinhardt Z., Alibert Y., Lovis C., Delgado Mena E., Sozzetti A., Barros S.C.C., Bossini D., Ziegler C., Ciardi D.R., Matthews E.C., Carter P.J., Lillo-Box J., Suárez Mascareño A., Cristiani S., Pepe F., Rebolo R., Santos N.C., Allende Prieto C., Benatti S., Bouchy F., Briceño C., Di Marcantonio P., D'Odorico V., Dumusque X., Egger J.A., Ehrenreich D., Faria J., Figueira P., Génova Santos R., Gonzales E.J., González Hernández J.I., Law N., Lo Curto G., Mann A.W., Martins C.J.A.P., Mehner A., Micela G., Molaro P., Nunes N.J., Palle E., Poretti E., Schlieder J.E., Udry S. "A compact multi-planet system transiting HIP 29442 (TOI-469) discovered by TESS and ESPRESSO: Radial velocities lead to the detection of transits with low signal-to-noise ratio" Astronomy and Astrophysics, 679, art. no. A33

Damasso M., Scandariato G., Nascimbeni V., Nardiello D., Mancini L., Marino G., Bruno G., Brandeker A., Leto G., Marzari F., Lanza A.F., Benatti S., Desidera S., Béjar V.J.S., Biagini A., Borsato L., Cabona L., Claudi R., Lodieu N., Maggio A., Mallorquín M., Messina S., Micela G., Ricci D., Sozzetti A., Suárez Mascareño A., Turrini D., Zapatero Osorio M.R. "Photometric follow-up of the 20 Myr old multi-planet host star V1298 Tau with CHEOPS and ground-based telescopes" Astronomy and Astrophysics, 680, art. no. A8

David P., Mignard F., Hestroffer D., Tanga P., Spoto F., Berthier J., Pauwels T., Roux W., Barbier A., Cellino A., Carry B., Delbo M., Dell'oro A., Fouron C., Galluccio L., Klioner S.A., Mary N., Muinonen K., Ordenovic C., Oreshina-Slezak I., Panem C., Petit J.-M., Portell J., Brown A.G.A., Thuillot W., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Lammers U., Lindegren L., Luri X., Randich S., Sartoretti P., Smiljanic R., Walton N.A., Bailer-Jones C.A.L., Bastian U., Cropper M., Drimmel R., Katz D., Soubiran C., Van Leeuwen F., Audard M., Bakker J., Blomme R., Castañeda J., De Angeli F., Fabricius C., Fouesneau M., Frémat Y., Guerrier A., Masana E., Messineo R., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Teyssier D., Altmann M., Benson K., Burgess P.W., Busonero D., Busso G., Cánovas H., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Delchambre L., Fraile Garcia E., Garabato D., García-Lario P., Garralda Torres N., Gavras P., Haigron R., Hambly N.C., Harrison D.L., Hatzidimitriou D., Hernández J., Hodgkin S.T., Holl B., Jamal S., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Lorca A., Marchal O., Marrese P.M., Moitinho A., Nuñez Campos M., Osborne P., Pancino E., Recio-Blanco A., Riello M., Rimoldini L., Robin A.C., Roegiers T., Sarro L.M., Schultheis M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Weingrill K., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Altavilla G., Álvarez M.A., Alves J., Anderson R.I., Antoja T., Baines D., Baker S.G., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bashi D., Bauchet N., Baudeau N., Becciani U., Bedin L.R., Bellas-Velidis I., Bellazzini M., Beordo W., Berihuete A., Bernet M., Bertolotto C., Bertone S., Bianchi L., Binnenfeld A., Blazere A., Boch T., Bombrun A., Bouquillon S., Bragaglia A., Braine J., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cannizzo S., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Carretero J., Carton S., Casamiquela L., Castellani M., Castro-Ginard A., Cesare V., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Collins R., Contursi G., Cooper W.J., Cornez T., Crosta M., Crowley C., Dafonte C., De Laverny P., De Luise F., De March R., De Souza R., De Torres A., Del Peloso E.F., Delgado A., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Dsilva K., Durán J., Enke H., Esquej P., Fabre C., Fabrizio M., Faigler S., Fatović M., Fedorets G., Fernández-Hernández J., Fernique P., Figueras F., Fournier Y., Gai M., Galinier M., Garcia-Gutierrez A., García-Torres M., Garofalo A., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., Gosset E., Granvik M., Gregori Barrera V., Gutiérrez-Sánchez R., Haywood M., Helmer A., Helmi A., Henares K., Hidalgo S.L., Hilger T., Hobbs D., Hottier C., Huckle H.E., Jabłońska M., Jansen F., Jiménez-Arranz Ó., Juaristi Campillo J., Khanna S., Kordopatis G., Kóspál Á., Kostrzewa-Rutkowska Z., Kun M., Lambert S., Lanza A.F., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Lecoeur-Taibi I., Lecoutre G., Liao S., Liberato L., Licata E., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Loup C., Mahy L., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marín Pina D., Marinoni S., Marshall D.J., Martín Lozano J., Martín-Fleitas J.M., Marton G., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Meichsner J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Mowlavi N., Munoz D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Nieto S., Noval L., Ogden A., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Pegoraro L., Penttilä A., Pesciullesi P., Piersimoni A.M., Pinamonti M., Pineau F.-X., Plachy E., Plum G., Poggio E., Pourbaix D., Prša A., Pulone L., Racero E., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Ratajczak M., Re Fiorentin P., Regibo S., Reylé C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin C., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sarrate Riera C., Sciacca E., Segovia J.C., Ségransan D., Shahaf S., Siebert A., Siltala L., Slezak E., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spina L., Spitoni E., Squillante L.A., Steele I.A., Steidelmüller H., Surdej J., Szabados L., Taris F., Taylor M.B., Teixeira R., Tisanić K., Tolomei L., Torra F., Torralba Elipe G., Trabucchi M., Tsantaki M., Ulla A., Unger N., Vanel O., Vecchiato A., Vicente D., Voutsinas S., Weiler M., Wyrzykowski Ł., Zhao H., Zorec J., Zwitter T., Balaguer-Núñez L., Leclerc N., Morgenthaler S., Robert G., Zucker S. "Gaia Focused Product Release: Asteroid orbital solution: Properties and assessment" Astronomy and Astrophysics, 680, art. no. A37

De La Concepción J.G., Jiménez-Serra I., Rivilla V.M., Colzi L., Martín-Pintado J. "Paving the way to the synthesis of PAHs in dark molecular clouds: The formation of cyclopentadienyl radical (c-C5H5)" Astronomy and Astrophysics, 673, art. no. A118

De La Reza R., Chavero C., Roca-Fàbrega S., Llorente De Andrés F., Cruz P., Cifuentes C. "Searching for the nature of stars with debris disks and planets" Astronomy and Astrophysics, 671, art. no. A136

de la Torre Juárez M., Chavez A., Tamppari L.K., Munguira A., Martínez G., Hueso R., Chide B., Murdoch N., Stott A.E., Navarro S., Sánchez-Lavega A., Orton G.S., Viúdez-Moreiras D., Banfield D.J., Rodríguez-Manfredi J.A. "Diurnal Cycle of Rapid Air Temperature Fluctuations at Jezero Crater: Probability Distributions, Exponential Tails, Scaling, and Intermittency" Journal of Geophysical Research: Planets, 128 (7), art. no. e2022JE007458

de Leon J.P., Livingston J.H., Jenkins J.S., Vines J.I., Wittenmyer R.A., Clark J.T., Winn J.I.M., Addison B., Ballard S., Bayliss D., Beichman C., Benneke B., Berardo D.A., Bowler B.P., Brown T., Bryant E.M., Christiansen J., Ciardi D., Collins K.A., Collins K.I., Crossfield I., Deming D., Dragomir D., Dressing C.D., Fukui A., Gan T., Giacalone S., Gill S., Gorjian V., Alvarez E.G., Hesse K., Horner J., Howell S.B., Jenkins J.M., Kane S.R., Kendall A., Kielkopf J.F., Kreidberg L., Latham D.W., Liu H., Lund M.B., Matson R., Matthews E., Mengel M.W., Morales F., Mori M., Narita N., Nishiumi T., Okumura J., Plavchan P., Quinn S., Rabus M., Ricker G., Rudat A., Schlieder J.,

Schwarz R.P., Seager S., Shporer A., Smith A.M.S., Stassun K., Tamura M., Tan T.G., Tinney C., Vanderspek R., Werner M.W., West R.G., Wright D., Zhang H., Zhou G. "A sub-Neptune transiting the young field star HD 18599 at 40 pc" Monthly Notices of the Royal Astronomical Society, 522 (1), pp. 750 – 766

De Ridder J., Ripepi V., Aerts C., Palaversa L., Eyer L., Holl B., Audard M., Rimoldini L., Brown A.G.A., Vallenari A., Prusti T., de Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., van Leeuwen F., Bakker J., Cacciari C., Castañeda J., De Angeli F., Fabricius C., Fouesneau M., Frémat Y., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Andrae R., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., de Teodoro P., Campos M.N., Delchambre L., Dell'Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hilger T., Hodgkin S.T., Janßen K., de Fombelle G.J., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Reylé C., Riello M., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., van Leeuwen M., Abbas U., Ábrahám P., Aramburu A.A., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Varela E.A., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., de Laverny P., De Luise F., De March R., de Souza R., de Torres A., del Peloso E.F., del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Piccolo A.J.-A., Jiménez-Arranz Ó., Campillo J.J., Julbe F., Karbevska L., Kervella P., Khanna S., Kordopatis G., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Pardo P.M., Romeo A.M., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Santos M.M.S.M., Pina D.M., Marinoni S., Marocco F., Marshall D.J., Polo L.M.,

Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Esteller X.P., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Diaz C.R., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Mieres D.R., Rybicki K.A., Sadowski G., Núñez A.S., Sellés A.S., Sahlmann J., Salguero E., Samaras N., Gimenez V.S., Sanna N., Santoveña R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Elipe G.T., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., vanDillen E., van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: Pulsations in main sequence OBAF-type stars” Astronomy and Astrophysics, 674, art. no. A36

del Barrio M., Martínez-Periñán E., Gutiérrez-Sánchez C., Mateo-Martí E., Pita M., De Lacey A.L., Pariente F., Lorenzo E. “Carbon nanodots modified-electrode for peroxide-free cholesterol biosensing and biofuel cell design” Sensors and Actuators B: Chemical, 375, art. no. 132895

Delrez L., Leleu A., Brandeker A., Gillon M., Hooton M.J., Collier Cameron A., Deline A., Fortier A., Queloz D., Bonfanti A., Van Grootel V., Wilson T.G., Egger J.A., Alibert Y., Alonso R., Anglada G., Asquier J., Bárczy T., Barrado Y Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Bonfils X., Borsato L., Broeg C., Buder M., Cabrera J., Cessa V., Charnoz S., Csizmadia S., Cubillos P.E., Davies M.B., Deleuil M., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Fossati L., Fridlund M., Gandolfi D., Güdel M., Hasiba J., Hoyer S., Isaak K.G., Jenkins J.M., Kiss L.L., Laskar J., Latham D.W., Lecavelier Des Etangs A., Lendl M., Lovis C., Luque R., Magrin D., Maxted P.F.L., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Ragazzoni R., Rando N., Rauer H., Ribas I., Ricker G., Santos N.C., Scandariato G., Seager S., Ségransan D., Simon A.E., Smith A.M.S., Sousa S.G., Steller M., Szabó G.M., Thomas N., Udry S., Vanderspek R., Venturini J., Viotto V., Walton N.A., Winn J.N. “Refining the properties of the TOI-178 system with CHEOPS and TESS” Astronomy and Astrophysics, 678, art. no. A200

Demory B.-O., Sulis S., Meier Valdés E., Delrez L., Brandeker A., Billot N., Fortier A., Hoyer S., Sousa S.G., Heng K., Lendl M., Krenn A., Morris B.M., Patel J.A., Alibert Y., Alonso R., Anglada G., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Bonfils X., Broeg C., Buder M., Cabrera J., Charnoz S., Collier Cameron A., Cottard H., Csizmadia S., Davies M.B., Deleuil M., Demangeon O.D.S., Ehrenreich D., Erikson A., Fossati L., Fridlund M., Gandolfi

D., Gillon M., Güdel M., Isaak K.G., Kiss L.L., Laskar J., Lecavelier Des Etangs A., Lovis C., Luntzer A., Magrin D., Marafatto L., Maxted P.F.L., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Ratti F., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Van Grootel V., Walton N.A. “55 Cancri e's occultation captured with CHEOPS” Astronomy and Astrophysics, 669, art. no. A64

Di Pietro I., Schmidt G., Tangari A.C., Salese F., Silvestro S., Fairén A.G., Marinangeli L., Pondrelli M. “Groundwater-Controlled Deposition of Equatorial Layered Deposits in Central Arabia Terra, Mars” Journal of Geophysical Research: Planets, 128 (3), art. no. e2022JE007504

Díaz-Rullo J., González-Pastor J.E. “tRNA queuosine modification is involved in biofilm formation and virulence in bacteria” Nucleic Acids Research, 51 (18), pp. 9821 – 9837

Ding Y., Zhu L., Van De Ven G., Coccato L., Corsini E.M., Costantin L., Fahrion K., Falcón-Barroso J., Gadotti D.A., Iodice E., Lyubenova M., Martín-Navarro I., Mcdermid R.M., Pinna F., Sarzi M. “The Fornax3D project: Environmental effects on the assembly of dynamically cold disks in Fornax cluster galaxies” Astronomy and Astrophysics, 672, art. no. A84

Ditrani F.R., Longhetti M., La Barbera F., Iovino A., Costantin L., Zibetti S., Gallazzi A., Fossati M., Angthopo J., Ascasibar Y., Poggianti B., Sánchez-Blázquez P., Balcells M., Bianconi M., Bolzonella M., Cassarà L.P., Cucciati O., Dalton G., Ferré-Mateu A., García-Benito R., Granett B., Gullieuszik M., Ikhsanova A., Jin S., Knapen J.H., McGee S., Mercurio A., Morelli L., Moretti A., Murphy D., Pizzella A., Pozzetti L., Spiniello C., Tortora C., Trager S.C., Vazdekis A., Vergani D., Vulcani B. “Stellar metallicity from optical and UV spectral indices: Test case for WEAVE-StePS” Astronomy and Astrophysics, 677, art. no. A93

Donnan F.R., García-Bernete I., Rigopoulou D., Pereira-Santaella M., Alonso-Herrero A., Roche P.F., Hernán-Caballero A., Spoon H.W.W. “The obscured nucleus and shocked environment of VV 114E revealed by JWST/MIRI spectroscopy” Monthly Notices of the Royal Astronomical Society, 519 (3), pp. 3691 – 3705

Donnan F.R., Rigopoulou D., García-Bernete I., Pereira-Santaella M., Alonso-Herrero A., Roche P.F., Aalto S., Hernán-Caballero A., Spoon H.W.W. “A detailed look at the most obscured galactic nuclei in the mid-infrared” Astronomy and Astrophysics, 669, art. no. A87

Dos Santos L.A., García Muñoz A., Sing D.K., López-Morales M., Alam M.K., Bourrier V., Ehrenreich D., Henry G.W., Lecavelier des Etangs A., Mikal-Evans T., Nikolov N.K., Sanz-Forcada J., Wakeford H.R. “Hydrodynamic Atmospheric Escape in HD 189733 b: Signatures of Carbon and Hydrogen Measured with the Hubble Space Telescope" Astronomical Journal, 166 (3), art. no. 89

Drimmel R., Romero-Gomez M., Chemin L., Ramos P., Poggio E., Ripepi V., Andrae R., Blomme R., Cantat-Gaudin T., Castro-Ginard A., Clementini G., Figueras F., Fouesneau M., Fremat Y., Jardine K., Khanna S., Lobel A., Marshall D.J., Muraveva T., Brown A.G.A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Jansen F., Katz D., Lattanzi M.G., Van Leeuwen F., Bakker J., Cacciari C., Castaneda J., De Angeli F., Fabricius C., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thevenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Audard M., Bellas-Velidis I., Benson K., Berthier J., Burgess P.W., Busonero D., Busso G., Canovas H., Carry B., Cellino A., Cheek N., Damerdji Y., Davidson M., de Teodoro P., Campos M.N., Delchambre L., Dell'Oro A., Esquej P., Fernandez-Hernandez J., Fraile E., Garabato D., Garcia-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernandez J., Hestroffer D., Hodgkin S.T., Holl B., Jansen K., De Fombelle G.J., Jordan S., Krone-Martins A., Lanzafame A.C., Löer W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Reyle C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Abraham P., Aramburu A.A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Alvarez M.A., Alves J., Anders F., Anderson R.I., Varela E.A., Antoja T., Baines D., Baker S.G., Balaguer-Nunez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolome S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Chaoul L., Charlot P., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., de Laverny P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Di Matteo P., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., Garcia-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., Gonzalez-Nunez J., Gonzalez-Santamaria I., Gonzalez-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutierrez-Sanchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jasniewicz G., Piccolo A.J-A., Jimenez-Arranz O., Campillo J.J., Julbe F., Karbevska L., Kervella P., Kordopatis G., Korn A.J., Kospal A., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrom H.E.P., Lister T.A., Livanou E., Lorca A., Loup C., Pardo P.M., Romeo A.M., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Santos M.M.S.M., Pina D.M., Marinoni S., Marocco F., Polo L.M., Martin-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar

N.R., Mints A., Molina D., Molinaro R., Molnar L., Monari G., Monguio M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Murphy C.P., Musella I., Nagy Z., Noval L., Ocana F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Esteller X.P., Penttila A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Diaz C.R., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Rowell N., Royer F., Mieres D.R., Rybicki K.A., Sadowski G., Nunez A.S., Selles A.S., Sahlmann J., Salguero E., Samaras N., Gimenez V.S., Sanna N., Santovena R., Sarasso M., Schultheis M.S., Sciacca E., Segol M., Segovia J.C., Segransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmuller H., Stephenson C.A., Suveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Elipe G.T., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., Van Dillen E., Van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: Mapping the asymmetric disc of the Milky Way” Astronomy and Astrophysics, 674, art. no. A37

Duque-Arribas C., Montes D., Tabernero H.M., Caballero J.A., Gorgas J., Marfil E. “Photometric Calibrations of M-dwarf Metallicity with Markov Chain Monte Carlo and Bayesian Inference” Astrophysical Journal, 944 (1), art. no. 106

Ehrenreich D., Delrez L., Akinsanmi B., Wilson T.G., Bonfanti A., Beck M., Benz W., Hoyer S., Queloz D., Alibert Y., Charnoz S., Collier Cameron A., Deline A., Hooton M., Lendl M., Olofsson G., Sousa S.G., Adibekyan V., Alonso R., Anglada G., Barrado D., Barros S.C.C., Baumjohann W., Beck T., Bekkelien A., Bergomi M., Billot N., Bonfils X., Brandeker A., Broeg C., Bárczy T., Berta-Thompson Z.K., Cabrera J., Corral Van Damme C., Csizmadia S., Davies M.B., Deleuil M., Demangeon O., Demory B.-O., Doty J.P., Erikson A., Fausnaugh M.M., Florén H.-G., Fortier A., Fossati L., Fridlund M., Futyan D., Gandolfi D., Gillon M., Guterman P., Güdel M., Heng K., Isaak K.G., Jäckel A., Jenkins J.M., Kiss L.L., Laskar J., Latham D.W., Lecavelier Des Etangs A., Levine A.M., Lovis C., Magrin D., Maxted P.F.L., Morgan E.H., Nascimbeni V., Osborn H.P., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Ragazzoni R., Rando N., Rauer H., Ribas I., Ricker G.R., Salmon S., Santos N.C., Scandariato G., Simon A.E., Smith A.M.S., Steinberger M., Steller M., Szabó G.M., Ségransan D., Shporer A., Thomas N., Tschentscher M., Udry S., Vanderspek R., Van Grootel V., Walton N.A. “A full transit of v 2Lupi d and the search for an exomoon in its Hill sphere with CHEOPS” Astronomy and Astrophysics, 671, art. no. A154

Elsaesser A., Burr D.J., Mabey P., Urso R.G., Billi D., Cockell C., Cottin H., Kish A., Leys N., van Loon J.J.W.A., Mateo-Marti E., Moissl-Eichinger C., Onofri S., Quinn R.C., Rabbow E., Rettberg P., de la Torre Noetzel R., Slenzka K., Ricco A.J., de Vera J.-P., Westall F. “Future space experiment platforms for astrobiology and astrochemistry research” npj Microgravity, 9 (1), art. no. 43

Emonts B.H.C., Lehnert M.D., Lebowitz S., Miley G.K., Villar-Martín M., Norris R., De Breuck C., Carilli C., Feain I. “CO Survey of High-z Radio Galaxies, Revisited with the Atacama Large Millimeter/submillimeter Array: Jet-Cloud Alignments and Synchrotron Brightening by Molecular Gas in the Circumgalactic Environment” Astrophysical Journal, 952 (2), art. no. 148

Emonts B.H.C., Lehnert M.D., Yoon I., Mandelker N., Villar-Martín M., Miley G.K., De Breuck C., Pérez-Torres M.A., Hatch N.A., Guillard P. “A cosmic stream of atomic carbon gas connected to a massive radio galaxy at redshift 3.8” Science, 379 (6639), pp. 1323 – 1326

Escudero C., Amils R. “Hard rock dark biosphere and habitability” Frontiers in Astronomy and Space Sciences, 10, art. no. 1203845

Esplugues G., Rodríguez-Baras M., San Andrés D., Navarro-Almaida D., Fuente A., Rivière-Marichalar P., Sánchez-Monge Á., Drozdovskaya M.N., Spezzano S., Caselli P. “Evolution of Chemistry in the envelope of HOt corinoS (ECHOS): I. Extremely young sulphur chemistry in the isolated Class 0 object B 335” Astronomy and Astrophysics, 678, art. no. A199

Estrada N., Mercurio A., Vulcani B., Rodighiero G., Nonino M., Annunziatella M., Rosati P., Grillo C., Caminha G.B., Angora G., Biviano A., Brescia M., De Lucia G., Demarco R., Girardi M., Gobat R., Lemaux B.C. “VST-GAME: Galaxy assembly as a function of mass and environment with VST: Photometric assessment and density field of MACSJ0416” Astronomy and Astrophysics, 671, art. no. A146

Evans C., Marcolino W., Bouret J.-C., Garcia M. “A near-UV reconnaissance of metal-poor massive stars” Experimental Astronomy, 56 (2-3), pp. 537 – 556

Evans L., Vastel C., Fontani F., Pineda J.E., Jiménez-Serra I., Alves F., Sakai T., Bouvier M., Caselli P., Ceccarelli C., Chandler C., Svoboda B., Maud L., Codella C., Sakai N., Le Gal R., López-Sepulcre A., Moellenbrock G., Yamamoto S. “FAUST: X. Formaldehyde in the protobinary system [BHB2007] 11: Small-scale deuteration” Astronomy and Astrophysics, 678, art. no. A160

Fairén A.G., Rodríguez N., Sánchez-García L., Rojas P., Uceda E.R., Carrizo D., Amils R., Sanz J.L. “Ecological successions throughout the desiccation of Tirez lagoon (Spain) as an astrobiological time-analog for wet-to-dry transitions on Mars” Scientific Reports, 13 (1), art. no. 1423

Fatima M., Müller H.S.P., Zingsheim O., Lewen F., Rivilla V.M., Jiménez-Serra I., Martín-Pintado J., Schlemmer S. “Millimetre and submillimetre spectroscopy of isobutene and its detection in the molecular cloud G+0.693” Astronomy and Astrophysics, 680, art. no. A25

Fatima N., Salehi H., Cueto-Díaz E.J., Desoutter A., Cuisinier F., Cunin F., Collart-Dutilleul P.-Y. “Nanostructured Porous Silicon for Bone Tissue Engineering: Kinetics of Particle Degradation and Si-Controlled Release” Journal of Functional Biomaterials, 14 (10), art. no. 493

Fernández-Ruz M., Jiménez-Serra I., Aguirre J. “A Theoretical Approach to the Complex Chemical Evolution of Phosphorus in the Interstellar Medium” Astrophysical Journal, 956 (1), art. no. 47

Ferrari M., De Angelis S., Frigeri A., Bruschini E., Gómez F., De Sanctis M.C. “In situ measurement and sampling of acidic alteration products at Río Tinto in support of the scientific activity of the Ma_MISS instrument” Frontiers in Astronomy and Space Sciences, 10, art. no. 1197724

Finkel P.L., Carrizo D., Parro V., Sánchez-García L. “An Overview of Lipid Biomarkers in Terrestrial Extreme Environments with Relevance for Mars Exploration” Astrobiology, 23 (5), pp. 563 – 604

Finkelstein S.L., Bagley M.B., Ferguson H.C., Wilkins S.M., Kartaltepe J.S., Papovich C., Yung L.Y., Haro P.A., Behroozi P., Dickinson M., Kocevski D.D., Koekemoer A.M., Larson R.L., Le Bail A., Morales A.M., Pérez-González P.G., Burgarella D., Davé R., Hirschmann M., Somerville R.S., Wuyts S., Bromm V., Casey C.M., Fontana A., Fujimoto S., Gardner J.P., Giavalisco M., Grazian A., Grogin N.A., Hathi N.P., Hutchison T.A., Jha S.W., Jogee S., Kewley L.J., Kirkpatrick A., Long A.S., Lotz J.M., Pentericci L., Pierel J.D.R., Pirzkal N., Ravindranath S., Ryan R.E., Jr., Trump J.R., Yang G., Bhatawdekar R., Bisigello L., Buat V., Calabrò A., Castellano M., Cleri N.J., Cooper M.C., Croton D., Daddi E., Dekel A., Elbaz D., Franco M., Gawiser E., Holwerda B.W., Huertas-Company M., Jaskot A.E., Leung G.C.K., Lucas R.A., Mobasher B., Pandya V., Tacchella S., Weiner B.J., Zavala J.A. “CEERS Key Paper. I. An Early Look into the First 500 Myr of Galaxy Formation with JWST” Astrophysical Journal Letters, 946 (1), art. no. L13

Fontani F., Roueff E., Colzi L., Caselli P. “The evolution of sulphur-bearing molecules in high-mass star-forming cores” Astronomy and Astrophysics, 680, art. no. A58

Franchini A., Bonetti M., Lupi A., Miniutti G., Bortolas E., Giustini M., Dotti M., Sesana A., Arcodia R., Ryu T. “Quasi-periodic eruptions from impacts between the secondary and a rigidly precessing accretion disc in an extreme mass-ratio inspiral system” Astronomy and Astrophysics, 675, art. no. A100

Fuente A., Rivière-Marichalar P., Beitia-Antero L., Caselli P., Wakelam V., Esplugues G., Rodríguez-Baras M., Navarro-Almaida D., Gerin M., Kramer C., Bachiller R., Goicoechea J.R., Jiménez-Serra I., Loison J.C., Ivlev A., Martín-Doménech R., Spezzano S., Roncero O., Muñoz-Caro G., Cazaux S., Marcelino N. "Gas phase Elemental abundances in Molecular cloudS (GEMS): VII. Sulfur elemental abundance" Astronomy and Astrophysics, 670, art. no. A114

Fuhrmeister B., Czesla S., Perdelwitz V., Nagel E., Schmitt J.H.M.M., Jeffers S.V., Caballero J.A., Zechmeister M., Montes D., Reiners A., López-Gallifa Á., Ribas I., Quirrenbach A., Amado P.J., Galadí-Enríquez D., Béjar V.J.S., Danielski C., Hatzes A.P., Kaminski A., Kürster M., Morales J.C., Zapatero Osorio M.R. "The CARMENES search for exoplanets around M dwarfs: Variability on long timescales as seen in chromospheric indicators" Astronomy and Astrophysics, 670, art. no. A71

Fuhrmeister B., Czesla S., Schmitt J.H.M.M., Schneider P.C., Caballero J.A., Jeffers S.V., Nagel E., Montes D., Gálvez Ortiz M.C., Reiners A., Ribas I., Quirrenbach A., Amado P.J., Henning T., Lodieu N., Martín-Fernández P., Morales J.C., Schöfer P., Seifert W., Zechmeister M. "The CARMENES search for exoplanets around M dwarfs: Behaviour of the Paschen lines during flares and quiescence" Astronomy and Astrophysics, 678, art. no. A1

Fujimoto S., Finkelstein S.L., Burgarella D., Carilli C.L., Buat V., Casey C.M., Ciesla L., Tacchella S., Zavala J.A., Brammer G., Fudamoto Y., Ouchi M., Valentino F., Cooper M.C., Dickinson M., Franco M., Giavalisco M., Hutchison T.A., Kartaltepe J.S., Koekemoer A.M., Kojima T., Larson R.L., Murphy E.J., Papovich C., Pérez-González P.G., Somerville R.S., Yoon I., Wilkins S.M., Akins H., Amorín R.O., Arrabal Haro P., Bagley M.B., Chworowsky K., Cleri N.J., Cooper O.R., Costantin L., Daddi E., Ferguson H.C., Grogin N.A., Jiménez-Andrade E.F., Juneau S., Kirkpatrick A., Kocevski D.D., Le Bail A., Long A., Lucas R.A., Magnelli B., McKinney J., Rose C., Seillé L.-M., Simons R.C., Weiner B.J., Yung L.Y.A. "ALMA FIR View of Ultra-high-redshift Galaxy Candidates at z ~ 11-17: Blue Monsters or Low-z Red Interlopers?" Astrophysical Journal, 955 (2), art. no. 130

Gagnon J.-S., Hochberg D. "Conditions for the origin of homochirality in primordial catalytic reaction networks" Scientific Reports, 13 (1), art. no. 9885

Gallego-Rodríguez V., Martínez-Bonilla A., Rodríguez N., Amils R. "Dark Fermentation in the Dark Biosphere: The Case of Citrobacter sp. T1.2D-12" Fermentation, 9 (10), art. no. 887

Galli P.A.B., Miret-Roig N., Bouy H., Olivares J., Barrado D. "Dynamical age of the Tucana-Horologium young stellar association" Monthly Notices of the Royal Astronomical Society, 520 (4), pp. 6245 – 6255

Galluccio L., Delbo M., De Angeli F., Pauwels T., Tanga P., Mignard F., Cellino A., Brown A.G.A., Muinonen K., Penttila A., Jordan S., Vallenari A., Prusti T., de Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Walton N.A., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., van Leeuwen F., Bakker J., Cacciari C., Castaneda J., Fabricius C., Fouesneau M., Fremat Y., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thevenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Andrae R., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Canovas H., Carry B., Cheek N., Clementini G., Damerdji Y., Davidson M., de Teodoro P., Nunez Campos M., Delchambre L., Dell'Oro A., Esquej P., Fernandez-Hernandez J., Fraile E., Garabato D., Garcia-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernandez J., Hestroffer D., Hodgkin S.T., Holl B., Jansen K., de Fombelle G.J., Krone-Martins A., Lanzafame A.C., Löer W., Marchal O., Marrese P.M., Moitinho A., Osborne P., Pancino E., Recio-Blanco A., Reyle C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., van Leeuwen M., Abbas U., Abraham P., Aramburu A.A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Alvarez M.A., Alves J., Anderson R.I., Varela E.A., Antoja T., Baines D., Baker S.G., Balaguer-Nunez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolome S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., de Laverny P., De Luise F., De March R., De Ridder J., de Souza R., de Torres A., del Peloso E.F., del Pozo E., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., Garcia-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., Gonzalez-Nunez J., Gonzalez-Santamaria I., Gonzalez-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutierrez-Sanchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Piccolo A.J.-A., Jimenez-Arranz O., Campillo J.J., Julbe F., Karbevska L., Kervella P., Khanna S., Kordopatis G., Korn A.J., Kospal A., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrom H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Pardo P.M., Romeo A.M., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Santos M.M.S.M., Pina D.M., Marinoni S., Marocco F., Marshall D.J., Polo L.M., Martin-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnar L., Monari G., Monguio M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocana F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Esteller X.P., Petit J.-M., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Diaz C.R., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gomez M., Rowell N., Royer F., Mieres D.R., Rybicki K.A., Sadowski G., Nunez A.S., Selles A.S., Sahlmann J., Salguero E., Samaras N., Gimenez V.S., Sanna N., Santovena R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Segransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmuller H., Stephenson C.A., Suveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Elipe G.T., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., van Dillen E., van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski L., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: Reflectance spectra of Solar System small bodies” Astronomy and Astrophysics, 674, art. no. A35

Garai Z., Osborn H.P., Gandolfi D., Brandeker A., Sousa S.G., Lendl M., Bekkelien A., Broeg C., Cameron A.C., Egger J.A., Hooton M.J., Alibert Y., Delrez L., Fossati L., Salmon S., Wilson T.G., Bonfanti A., Tuson A., Ulmer-Moll S., Serrano L.M., Borsato L., Alonso R., Anglada G., Asquier J., Barrado Y Navascues D., Barros S.C.C., Bárczy T., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Biondi F., Bonfils X., Buder M., Cabrera J., Cessa V., Charnoz S., Csizmadia S., Cubillos P.E., Davies M.B., Deleuil M., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Van Eylen V., Fortier A., Fridlund M., Gillon M., Van Grootel V., Güdel M., Günther M.N., Hoyer S., Isaak K.G., Kiss L.L., Kristiansen M.H., Laskar J., Des Etangs A.L., Lovis C., Luntzer A., Magrin D., Maxted P.F.L., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Venturini J., Walton N. “Refined parameters of the HD 22946 planetary system and the true orbital period of planet d” Astronomy and Astrophysics, 674, art. no. A44

García De La Concepción J., Jiménez-Serra I., Corchado J.C., Molpeceres G., Martínez-Henares A., Rivilla V.M., Colzi L., Martín-Pintado J. “A sequential acid-base mechanism in the interstellar medium: The emergence of cis-formic acid in dark molecular clouds” Astronomy and Astrophysics, 675, art. no. A109

García-Argumánez I., Pérez-González P.G., de Paz A.G., Snyder G.F., Haro P.A., Bagley M.B., Finkelstein S.L., Kartaltepe J.S., Koekemoer A., Papovich C., Pirzkal N., Ferguson H.C., Aaron Yung L.Y., Annunziatella M., Cleri N.J., Cooper M.C., Costantin L., Holwerda B.W., Mérida R.M., Rose C., Giavalisco M., Grogin N.A., Kocevski D.D. “Probing the Earliest Phases in the Formation of Massive Galaxies with Simulated HST+JWST Imaging Data from Illustris” Astrophysical Journal, 944 (1), art. no. 3

García-Descalzo L., Lezcano M.Á., Carrizo D., Fairén A.G. “Changes in membrane fatty acids of a halo-psychrophile exposed to magnesium perchlorate and low temperatures: Implications for Mars habitability” Frontiers in Astronomy and Space Sciences, 10, art. no. 1034651

Gardner J.P., Mather J.C., Abbott R., Abell J.S., Abernathy M., Abney F.E., Abraham J.G., Abraham R., Abul-Huda Y.M., Acton S., Adams C.K., Adams E., Adler D.S., Adriaensen M., Aguilar J.A., Ahmed M., Ahmed N.S., Ahmed T., Albat R., Albert L., Alberts S., Aldridge D., Allen M.M., Allen S.S., Altenburg M., Altunc S., Alvarez J.L., Álvarez-Márquez J., de Oliveira C.A., Ambrose L.L., Anandakrishnan S.M., Andersen G.C., Anderson H.J., Anderson J., Anderson K., Anderson S.M., Aprea J., Archer B.J., Arenberg J.W., Argyriou I., Arribas S., Artigau I., Arvai A.R., Atcheson P., Atkinson C.B., Averbukh J., Aymergen C., Bacinski J.J., Baggett W.E., Bagnasco G., Baker L.L., Balzano V.A., Banks K.A., Baran D.A., Barker E.A., Barrett L.K., Barringer B.O., Barto A., Bast W., Baudoz P., Baum S., Beatty T.G., Beaulieu M., Bechtold K., Beck T., Beddard M.M., Beichman C., Bellagama L., Bely P., Berger T.W., Bergeron L.E., Bernier A.-D., Bertch M.D., Beskow C., Betz L.E., Biagetti C.P., Birkmann S., Bjorklund K.F., Blackwood J.D., Blazek R.P., Blossfeld S., Bluth M., Boccaletti A., Boegner Jr M.E., Bohlin R.C., Boia J.J., Böker T., Bonaventura N., Bond N.A., Bosley K.A., Boucarut R.A., Bouchet P., Bouwman J., Bower G., Bowers A.S., Bowers C.W., Boyce L.A., Boyer C.T., Boyer M.L., Boyer M., Boyer R., Bradley L.D., Brady G.R., Brandl B.R., Brannen J.L., Breda D., Bremmer H.G., Brennan D., Bresnahan P.A., Bright S.N., Broiles B.J., Bromenschenkel A., Brooks B.H., Brooks K.J., Brown B., Brown B., Brown T.M., Bruce B.W., Bryson J.G., Bujanda E.D., Bullock B.M., Bunker A.J., Bureo R., Burt I.J., Bush J.A., Bushouse H.A., Bussman M.C., Cabaud O., Cale S., Calhoon C.D., Calvani H., Canipe A.M., Caputo F.M., Cara M., Carey L., Case M.E., Cesari T., Cetorelli L.D., Chance D.R., Chandler L., Chaney D., Chapman G.N., Charlot S., Chayer P., Cheezum J.I., Chen B., Chen C.H., Cherinka B., Chichester S.C., Chilton Z.S., Chittiraibalan D., Clampin M., Clark C.R., Clark K.W., Clark S.M., Claybrooks E.E., Cleveland K.A., Cohen A.L., Cohen L.M., Colón K.D., Coleman B.L., Colina L., Comber B.J., Comeau T.M., Comer T., Reis A.C., Connolly D.C., Conroy K.E., Contos A.R., Contreras J., Cook N.J., Cooper J.L., Cooper R.A., Correia M.F., Correnti M., Cossou C., Costanza B.F., Coulais A., Cox C.R., Coyle R.T., Cracraft M.M., Crew K.A., Curtis G.J., Cusveller B., Maciel C.D.C., Dailey C.T., Daugeron F., Davidson G.S., Davies J.E., Davis K.A., Davis M.S., Day R., de Chambure D., de Jong P., De Marchi G., Dean B.H., Decker J.E., Delisa A.S., Dell L.C., Dellagatta G., Dembinska F., Demosthenes S., Dencheva N.M., Deneu P., DePriest W.W., Deschenes J., Dethienne N., Detre I.H., Diaz R.I., Dicken D., DiFelice A.S., Dillman M., Disharoon M.O., Dixon W.V., Doggett J.B., Dominguez K.L., Donaldson T.S., Doria-Warner C.M., Santos T.D., Doty H., Douglas, Jr R.E., Doyon R., Dressler A., Driggers J., Driggers P.A., Dunn J.L., DuPrie K.C., Dupuis J., Durning J., Dutta S.B., Earl N.M., Eccleston P., Ecobichon P., Egami E., Ehrenwinkler R., Eisenhamer J.D., Eisenhower M., Eisenstein D.J., El Hamel Z., Elie M.L., Elliott J., Elliott K.W., Engesser M., Espinoza N., Etienne O., Etxaluze M., Evans L., Fabreguettes L., Falcolini M., Falini P.R., Fatig C., Feeney M., Feinberg L.D., Fels R., Ferdous N., Ferguson H.C., Ferrarese L., Ferreira M.-H., Ferruit P., Ferry M., Filippazzo J.C., Firre D., Fix M., Flagey N., Flanagan K.A., Fleming S.W., Florian M., Flynn J.R., Foiadelli L., Fontaine M.R., Fontanella E.M., Forshay P.R., Fortner E.A., Fox O.D., Framarini A.P., Francisco J.I., Franck R., Franx M., Franz D.E., Friedman S.D., Friend K.E., Frost J.R., Fu H., Fullerton A.W., Gaillard L., Galkin S., Gallagher B., Galyer A.D., García Marín M., Gardner L.E., Garland D., Garrett B.A., Gasman D., Gáspár A., Gastaud R., Gaudreau D., Gauthier P.T., Geers V., Geithner P.H., Gennaro M., Gerber J., Gereau J.C., Giampaoli R., Giardino G., Gibbons P.C., Gilbert K., Gilman L., Girard J.H., Giuliano M.E., Gkountis K., Glasse A., Glassmire K.Z., Glauser A.M., Glazer S.D., Goldberg J., Golimowski D.A.,

Gonzaga S.P., Gordon K.D., Gordon S.J., Goudfrooij P., Gough M.J., Graham A.J., Grau C.M., Green J.D., Greene G.R., Greene T.P., Greenfield P.E., Greenhouse M.A., Greve T.R., Greville E.M., Grimaldi S., Groe F.E., Groebner A., Grumm D.M., Grundy T., Güdel M., Guillard P., Guldalian J., Gunn C.A., Gurule A., Gutman I.M., Guy P.D., Guyot B., Hack W.J., Haderlein P., Hagan J.B., Hagedorn A., Hainline K., Haley C., Hami M., Hamilton F.C., Hammann J., Hammel H.B., Hanley C.J., Hansen C.A., Hardy B., Harnisch B., Harr M.H., Harris P., Hart J.A., Hartig G.F., Hasan H., Hashim K.M., Hashimoto R., Haskins S.J., Hawkins R.E., Hayden B., Hayden W.L., Healy M., Hecht K., Heeg V.J., Hejal R., Helm K.A., Hengemihle N.J., Henning T., Henry A., Henry R.L., Henshaw K., Hernandez S., Herrington D.C., Heske A., Hesman B.E., Hickey D.L., Hilbert B.N., Hines D.C., Hinz M.R., Hirsch M., Hitcho R.S., Hodapp K., Hodge P.E., Hoffman M., Holfeltz S.T., Holler B.J., Hoppa J.R., Horner S., Howard J.M., Howard R.J., Huber J.M., Hunkeler J.S., Hunter A., Hunter D.G., Hurd S.W., Hurst B.J., Hutchings J.B., Hylan J.E., Ignat L.I., Illingworth G., Irish S.M., Isaacs III J.C., Jackson Jr W.C., Jaffe D.T., Jahic J., Jahromi A., Jakobsen P., James B., James J.C., James L.R., Jamieson W.B., Jandra R.D., Jayawardhana R., Jedrzejewski R., Jeffers B.S., Jensen P., Joanne E., Johns A.T., Johnson C.A., Johnson E.L., Johnson P., Johnson P.S., Johnson T.K., Johnson T.W., Johnstone D., Jollet D., Jones D.P., Jones G.S., Jones O.C., Jones R.A., Jones V., Jordan I.J., Jordan M.E., Jue R., Jurkowski M.H., Justis G., Justtanont K., Kaleida C.C., Kalirai J.S., Kalmanson P.C., Kaltenegger L., Kammerer J., Kan S.K., Kanarek G.C., Kao S.-H., Karakla D.M., Karl H., Kassin S.A., Kauffman D.D., Kavanagh P., Kelley L.L., Kelly D.M., Kendrew S., Kennedy H.V., Kenny D.A., Keski-Kuha R.A., Keyes C.D., Khan A., Kidwell R.C., Kimble R.A., King J.S., King R.C., Kinzel W.M., Kirk J.R., Kirkpatrick M.E., Klaassen P., Klingemann L., Klintworth P.U., Knapp B.A., Knight S., Knollenberg P.J., Knutsen D.M., Koehler R., Koekemoer A.M., Kofler E.T., Kontson V.L., Kovacs A.R., Kozhurina-Platais V., Krause O., Kriss G.A., Krist J., Kristoffersen M.R., Krogel C., Krueger A.P., Kulp B.A., Kumari N., Kwan S.W., Kyprianou M., Labador A.G., Labiano I., Lafrenière D., Lagage P.-O., Laidler V.G., Laine B., Laird S., Lajoie C.-P., Lallo M.D., Lam M.Y., LaMassa S.M., Lambros S.D., Lampenfield R.J., Lander M.E., Langston J.H., Larson K., Larson M., LaVerghetta R.J., Law D.R., Lawrence J.F., Lee D.W., Lee J., Lee Y.P., Leisenring J., Leveille M.D., Levenson N.A., Levi J.S., Levine M.B., Lewis D., Lewis J., Lewis N., Libralato M., Lidon N., Liebrecht P.L., Lightsey P., Lilly S., Lim F.C., Lim P.L., Ling S.-K., Link L.J., Link M.N., Lipinski J.L., Liu X., Lo A.S., Lobmeyer L., Logue R.M., Long C.A., Long D.R., Long I.D., Long K.S., López-Caniego M., Lotz J.M., Love-Pruitt J.M., Lubskiy M., Luers E.B., Luetgens R.A., Luevano A.J., G. Flores Lui S.M., Lund III J.M., Lundquist R.A., Lunine J., Lützgendorf N., Lynch R.J., MacDonald A.J., MacDonald K., Macias M.J., Macklis K.I., Maghami P., Maharaja R.Y., Maiolino R., Makrygiannis K.G., Malla S.G., Malumuth E.M., Manjavacas E., Marini A., Marrione A., Marston A., Martel A.R., Martin D., Martin P.G., Martinez K.L., Maschmann M., Masci G.L., Masetti M.E., Maszkiewicz M., Matthews G., Matuskey J.E., McBrayer G.A., McCarthy D.W., McCaughrean M.J., McClare L.A., McClare M.D., McCloskey J.C., McClurg T.D., McCoy M., McElwain M.W., McGregor R.D., McGuffey D.B., McKay A.G., McKenzie W.K., McLean B., McMaster M., McNeil W., De Meester W., Mehalick K.L., Meixner M., Meléndez M., Menzel M.P., Menzel M.T., Merz M., Mesterharm D.D., Meyer M.R., Meyett M.L., Meza L.E., Midwinter C., Milam S.N., Miller J.T., Miller W.C., Miskey C.L., Misselt K., Mitchell E.P., Mohan M., Montoya E.E., Moran M.J., Morishita T., Moro-Martín A., Morrison D.L., Morrison J., Morse E.C., Moschos M., Moseley S.H., Mosier G.E., Mosner P., Mountain M., Muckenthaler J.S., Mueller D.G., Mueller M., Muhiem D., Mühlmann P., Mullally S.E., Mullen S.M., Munger A.J., Murphy J., Murray K.T., Muzerolle J.C., Mycroft M., Myers A., Myers C.R., R. Myers F.R., Myers R., Myrick K., Nagle, IV A.F., Nayak O., Naylor B., Neff S.G., Nelan E.P., Nella J., Nguyen D.T., Nguyen M.N., Nickson B., Nidhiry J.J., Niedner M.B., Nieto-Santisteban M., Nikolov N.K., Nishisaka M.A., Noriega-Crespo A., Nota A., O'Mara R.C., Oboryshko M., O'Brien M.B., Ochs

W.R., Offenberg J.D., Ogle P.M., Ohl R.G., Olmsted J.H., Osborne S.B., O'Shaughnessy B.P., Östlin G., O'Sullivan B., Otor O.J., Ottens R., Ouellette N.N., Outlaw D.J., Owens B.A., Pacifici C., Page J.C., Paranilam J.G., Park S., Parrish K.A., Paschal L., Patapis P., Patel J., Patrick K., Pattishall Jr R.A., Paul D.W., Paul S.J., Pauly T.A., Pavlovsky C.M., Peña-Guerrero M., Pedder A.H., Peek M.W., Pelham P.A., Penanen K., Perriello B.A., Perrin M.D., Perrine R.F., Perrygo C., Peslier M., Petach M., Peterson K.A., Pfarr T., Pierson J.M., Pietraszkiewicz M., Pilchen G., Pipher J.L., Pirzkal N., Pitman J.T., Player D.M., Plesha R., Plitzke A., Pohner J.A., Poletis K.K., Pollizzi J.A., Polster E., Pontius J.T., Pontoppidan K., Porges S.C., Potter G.D., Prescott S., Proffitt C.R., Pueyo L., Quispe Neira I.A., Radich A., Rager R.T., Rameau J., Ramey D.D., Alarcon R.R., Rampini R., Rapp R., Rashford R.A., Rauscher B.J., Ravindranath S., Rawle T., Rawlings T.N., Ray T., Regan M.W., Rehm B., Rehm K.D., Reid N., Reis C.A., Renk F., Reoch T.B., Ressler M., Rest A.W., Reynolds P.J., Richon J.G., Richon K.V., Ridgaway M., Riedel A.R., Rieke G.H., Rieke M.J., Rifelli R.E., Rigby J.R., Riggs C.S., Ringel N.J., Ritchie C.E., Rix H.-W., Robberto M., Robinson G.L., Robinson M.S., Robinson O., Rock F.W., Rodriguez D.R., del Pino B.R., Roellig T., Rohrbach S.O., Roman A.J., Romelfanger F.J., Romo Jr F.P., Rosales J.J., Rose P., Roteliuk A.F., Roth M.N., Rothwell B.Q., Rouzaud S., Rowe J., Rowlands N., Roy A., Royer P., Rui C., Rumler P., Rumpl W., Russ M.L., Ryan M.B., Ryan R.M., Saad K., Sabata M., Sabatino R., Sabbi E., Sabelhaus P.A., Sabia S., Sahu K.C., Saif B.N., Salvignol J.-C., Samara-Ratna P., Samuelson B.S., Sanders F.A., Sappington B., Sargent B.A., Sauer A., Savadkin B.J., Sawicki M., Schappell T.M., Scheffer C., Scheithauer S., Scherer R., Schiff C., Schlawin E., Schmeitzky O., Schmitz T.S., Schmude D.J., Schneider A., Schreiber J., Schroeven-Deceuninck H., Schultz J.J., Schwab R., Schwartz C.H., Scoccimarro D., Scott J.F., Scott M.B., Seaton B.L., Seely B.S., Seery B., Seidleck M., Sembach K., Shanahan C.E., Shaughnessy B., Shaw R.A., Shay C.M., Sheehan E., Sheth K., Shih H.-Y., Shivaei I., Siegel N., Sienkiewicz M.G., Simmons D.D., Simon B.P., Sirianni M., Sivaramakrishnan A., Slade J.E., Sloan G.C., Slocum C.E., Slowinski S.E., Smith C.T., Smith E.P., Smith E.C., Smith K., Smith R., Smith S.J., Smolik J.L., Soderblom D.R., Sohn S.T., Sokol J., Sonneborn G., Sontag C.D., Sooy P.R., Soummer R., Southwood D.M., Spain K., Sparmo J., Speer D.T., Spencer R., Sprofera J.D., Stallcup S.S., Stanley M.K., Stansberry J.A., Stark C.C., Starr C.W., Stassi D.Y., Steck J.A., Steeley C.D., Stephens M.A., Stephenson R.J., Stewart A.C., Stiavelli M., Stockman H., Jr., Strada P., Straughn A.N., Streetman S., Strickland D.K., Strobele J.F., Stuhlinger M., Stys J.E., Such M., Sukhatme K., Sullivan J.F., Sullivan P.C., Sumner S.M., Sun F., Sunnquist B.D., Swade D.A., Swam M.S., Swenton D.F., Swoish R.A., Tam Litten O.I., Tamas L., Tao A., Taylor D.K., Taylor J.M., Plate M.T., Van Tea M., Teague K.K., Telfer R.C., Temim T., Texter S.C., Thatte D.G., Thompson C.L., Thompson L.M., Thomson S.R., Thronson H., Tierney C.M., Tikkanen T., Tinnin L., Tippet W.T., Todd C.W., Tran H.D., Trauger J., Trejo E.G., Vinh Truong J.H., Tsukamoto C.L., Tufail Y., Tumlinson J., Tustain S., Tyra H., Ubeda L., Underwood K., Uzzo M.A., Vaclavik S., Valenduc F., Valenti J.A., Van Campen J., van de Wetering I., Van Der Marel R.P., van Haarlem R., Vandenbussche B., van Dishoeck E.F., Vanterpool D.D., Vernoy M.R., Vila Costas M.B., Volk K., Voorzaat P., Voyton M.F., Vydra E., Waddy D.J., Waelkens C., Wahlgren G.M., Walker Jr F.E., Wander M., Warfield C.K., Warner G., Wasiak F.C., Wasiak M.F., Wehner J., Weiler K.R., Weilert M., Weiss S.B., Wells M., Welty A.D., Wheate L., Wheeler T.P., White C.L., Whitehouse P., Whiteleather J.M., Whitman W.R., Williams C.C., Willmer C.N.A., Willott C.J., Willoughby S.P., Wilson A., Wilson D., Wilson D.V., Windhorst R., Wislowski E.C., Wolfe D.J., Wolfe M.A., Wolff S., Wondel A., Woo C., Woods R.T., Worden E., Workman W., Wright G.S., Wu C., Wu C.-R., Wun D.D., Wymer K.B., Yadetie T., Yan I.C., Yang K.C., Yates K.L., Yeager C.R., Yerger E.J., Young E.T., Young G., Yu G., Yu S., Zak D.S., Zeidler P., Zepp R., Zhou J., Zincke C.A., Zonak S., Zondag E. "The James Webb Space Telescope Mission" Publications of the Astronomical Society of the Pacific, 135 (1048), art. no. 068001

Gasman D., Argyriou I., Sloan G.C., Aringer B., Álvarez-Márquez J., Fox O., Glasse A., Glauser A., Jones O.C., Justtanont K., Kavanagh P.J., Klaassen P., Labiano A., Larson K., Law D.R., Mueller M., Nayak O., Noriega-Crespo A., Patapis P., Royer P., Vandenbussche B. "JWST MIRI/MRS in-flight absolute flux calibration and tailored fringe correction for unresolved sources" Astronomy and Astrophysics, 673, art. no. A102

Gasman D., van Dishoeck E.F., Grant S.L., Temmink M., Tabone B., Henning T., Kamp I., Güdel M., Lagage P.-O., Perotti G., Christiaens V., Samland M., Arabhavi A.M., Argyriou I., Abergel A., Absil O., Barrado D., Boccaletti A., Bouwman J., Caratti o Garatti A., Geers V., Glauser A.M., Guadarrama R., Jang H., Kanwar J., Lahuis F., Morales-Calderón M., Mueller M., Nehmé C., Olofsson G., Pantin E., Pawellek N., Ray T.P., Rodgers-Lee D., Scheithauer S., Schreiber J., Schwarz K., Vandenbussche B., Vlasblom M., Waters R.L.B.F.M., Wright G., Colina L., Greve T.R., Östlin G. "MINDS Abundant water and varying C/O across the disk of Sz 98 as seen by JWST/MIRI" Astronomy and Astrophysics, 679, art. no. A117

Giannakis I., Martin-Torres J., Zorzano M.-P., Su Y., Warren C., Giannopoulos A. "Stochastic hyperbola fitting, probabilistic inversion, reverse-time migration and clustering: A novel interpretation toolbox for in-situ planetary radar" Icarus, 400, art. no. 115555

Gieser C., Beuther H., Van Dishoeck E.F., Francis L., Van Gelder M.L., Tychoniec L., Kavanagh P.J., Perotti G., Caratti O Garatti A., Ray T.P., Klaassen P., Justtanont K., Linnartz H., Rocha W.R.M., Slavicinska K., Colina L., Güdel M., Henning T., Lagage P.-O., A Stlin G., Vandenbussche B., Waelkens C., Wright G. "JOYS: Disentangling the warm and cold material in the high-mass IRAS 23385+6053 cluster" Astronomy and Astrophysics, 679, art. no. A108

Gimeno I., Rollano V., Zueco D., Duan Y., De Ory M.C., Gomez A., Gaita-Ariño A., Sánchez-Azqueta C., Astner T., Granados D., Hill S., Majer J., Coronado E., Luis F. "Optimal coupling of Ho W10 molecular magnets to superconducting circuits near spin clock transitions" Physical Review Applied, 20 (4), art. no. 044070

Giustini M., Rodríguez Hidalgo P., Reeves J.N., Matzeu G., Braito V., Eracleous M., Chartas G., Schartel N., Vignali C., Hall P.B., Waters T., Ponti G., Proga D., Dadina M., Cappi M., Miniutti G., De Vries L. "Coordinated X-ray and UV absorption within the accretion disk wind of the active galactic nucleus PG 1126-041" Astronomy and Astrophysics, 679, art. no. A73

Glass B., Bergman D., Parro V., Kobayashi L., Stoker C., Quinn R., Davila A., Willis P., Brinckerhoff W., Warren-Rhodes K., Wilhelm M.B., Caceres L., DiRuggiero J., Zacny K., Moreno-Paz M., Dave A., Seitz S., Grubisic A., Castillo M., Bonaccorsi R. "The Atacama Rover Astrobiology Drilling Studies (ARADS) Project" Astrobiology, 23 (12), pp. 1245 – 1258

Gómez-Guijarro C., Magnelli B., Elbaz D., Wuyts S., Daddi E., Le Bail A., Giavalisco M., Dickinson M., Pérez-González P.G., Arrabal Haro P., Bagley M.B., Bisigello L., Buat V., Burgarella D., Calabrò A., Casey C.M., Cheng Y., Ciesla L., Dekel A., Ferguson H.C., Finkelstein S.L., Franco M., Grogin N.A., Holwerda B.W., Jin S., Kartaltepe J.S., Koekemoer A.M., Kokorev V., Long A.S., Lucas R.A., Magdis G.E., Papovich C., Pirzkal N., Seillé L.-M., Tacchella S., Tarrasse M., Valentino F., De La Vega A., Wilkins S.M., Xiao M., Yung L.Y.A. "JWST CEERS probes the role of stellar mass and morphology in obscuring galaxies" Astronomy and Astrophysics, 677, art. no. A34

González-Álvarez E., Kemmer J., Chaturvedi P., Caballero J.A., Quirrenbach A., Amado P.J., Béjar V.J.S., Cifuentes C., Herrero E., Kossakowski D., Reiners A., Ribas I., Rodríguez E., Rodríguez-López C., Sanz-Forcada J., Shan Y., Stock S., Tabernero H.M., Tal-Or L., Osorio M.R.Z., Hatzes A.P., Henning T., López-González M.J., Montes D., Morales J.C., Pallé E., Pedraz S., Perger M., Reffert S., Sabotta S., Schweitzer A., Zechmeister M. "The CARMENES search for exoplanets around M dwarfs: A sub-Neptunian mass planet in the habitable zone of HN Lib" Astronomy and Astrophysics, 675, art. no. A141

González-Álvarez E., Zapatero Osorio M.R., Caballero J.A., Béjar V.J.S., Cifuentes C., Fukui A., Herrero E., Kawauchi K., Livingston J.H., López-González M.J., Morello G., Murgas F., Narita N., Pallé E., Passegger V.M., Rodríguez E., Rodríguez-López C., Sanz-Forcada J., Schweitzer A., Tabernero H.M., Quirrenbach A., Amado P.J., Charbonneau D., Ciardi D.R., Cikota S., Collins K.A., Conti D.M., Fausnaugh M., Hatzes A.P., Hedges C., Henning T., Jenkins J.M., Latham D.W., Massey B., Moldovan D., Montes D., Panahi A., Reiners A., Ribas I., Ricker G.R., Seager S., Shporer A., Srdoc G., Tenenbaum P., Vanderspek R., Winn J.N., Fukuda I., Ikoma M., Isogai K., Kawai Y., Mori M., Tamura M., Watanabe N. "Two sub-Neptunes around the M dwarf TOI-1470" Astronomy and Astrophysics, 675, art. no. A177

González-Martín O., Ramos Almeida C., Fritz J., Alonso-Herrero A., Hönig S.F., Roche P.F., Esparza-Arredondo D., García-Bernete I., García-Burillo S., Osorio-Clavijo N., Reyes-Amador U., Stalevski M., Victoria-Ceballos C. "The role of grain size in active galactic nuclei torus dust models" Astronomy and Astrophysics, 676, art. no. A73

Gonzalez-Otero M., Padilla-Torres C.P., Cepa J., De Jesús González J., Bongiovanni Á., Pérez García A.M., González-Serrano J.I., Alfaro E., Avila-Reese V., Benítez E., Binette L., Cerviño M., Cruz-González I., De Diego J.A., Gallego J., Hernández-Toledo H., Krongold Y., Lara-López M.A., Nadolny J., Pérez-Martínez R., Pović M., Sánchez-Portal M., Cedrés B., Dultzin D., Jiménez-Bailón E., Navarro Martínez R., Negrete C.A., Pintos-Castro I., Valenzuela O. "The Lockman-SpReSO project: Description, target selection, observations, and catalogue preparation" Astronomy and Astrophysics, 669, art. no. A85

González-Payo J., Caballero J.A., Cortés-Contreras M. "Reaching the boundary between stellar kinematic groups and very wide binaries: IV. The widest Washington Double Star systems with ρ ≤ ¥ 1000 arcsec in Gaia DR3" Astronomy and Astrophysics, 670, art. no. A102

González-Toril E., Permanyer A., Gallego J.R., Márquez G., Lorenzo E., Aguilera A. "Metagenomic analysis of the microbial community at the Riutort oil shale mine (NE Spain): Potential applications in bioremediation and enhanced oil recovery" Fuel, 349, art. no. 128609

Gorrini P., Kemmer J., Dreizler S., Burn R., Hirano T., Pozuelos F.J., Kuzuhara M., Caballero J.A., Amado P.J., Harakawa H., Kudo T., Quirrenbach A., Reiners A., Ribas I., Béjar V.J.S., Chaturvedi P., Cifuentes C., Galadí-Enríquez D., Hatzes A.P., Kaminski A., Kotani T., Kürster M., Livingston J.H., López González M.J., Montes D., Morales J.C., Murgas F., Omiya M., Pallé E., Rodríguez E., Sato B., Schweitzer A., Shan Y., Takarada T., Tal-Or L., Tamura M., Vievard S., Zapatero Osorio M.R., Zechmeister M. "Planetary companions orbiting the M dwarfs GJ 724 and GJ 3988: A CARMENES and IRD collaboration" Astronomy and Astrophysics, 680, art. no. A28

Grant D., Lewis N.K., Wakeford H.R., Batalha N.E., Glidden A., Goyal J., Mullens E., MacDonald R.J., May E.M., Seager S., Stevenson K.B., Valenti J.A., Visscher C., Alderson L., Allen N.H., Cañas C.I., Colón K., Clampin M., Espinoza N., Gressier A., Huang J., Lin Z., Long D., Louie D.R., Peña-Guerrero M., Ranjan S., Sotzen K.S., Valentine D., Anderson J., Balmer W.O., Bellini A., Hoch K.K.W., Kammerer J., Libralato M., Mountain C.M., Perrin M.D., Pueyo L., Rickman E., Rebollido I., Sohn S.T., van der Marel R.P., Watkins L.L. "JWST-TST DREAMS: Quartz Clouds in the Atmosphere of WASP-17b" Astrophysical Journal Letters, 956 (2), art. no. L29

Grant S.L., van Dishoeck E.F., Tabone B., Gasman D., Henning T., Kamp I., Güdel M., Lagage P.-O., Bettoni G., Perotti G., Christiaens V., Samland M., Arabhavi A.M., Argyriou I., Abergel A., Absil O., Barrado D., Boccaletti A., Bouwman J., o Garatti A.C., Geers V., Glauser A.M., Guadarrama R., Jang H., Kanwar J., Lahuis F., Morales-Calderón M., Mueller M., Nehmé C., Olofsson G., Pantin E., Pawellek N., Ray T.P., Rodgers-Lee D., Scheithauer S., Schreiber J., Schwarz K., Temmink M., Vandenbussche B., Vlasblom M., Waters L.B.F.M., Wright G., Colina L., Greve T.R., Justannont K., Östlin G. "MINDS. The Detection of 13CO2 with JWST-MIRI Indicates Abundant CO2 in a Protoplanetary Disk" Astrophysical Journal Letters, 947 (1), art. no. L6

Guo Y., Jogee S., Finkelstein S.L., Chen Z., Wise E., Bagley M.B., Barro G., Wuyts S., Kocevski D.D., Kartaltepe J.S., McGrath E.J., Ferguson H.C., Mobasher B., Giavalisco M., Lucas R.A., Zavala J.A., Lotz J.M., Grogin N.A., Huertas-Company M., Vega-Ferrero J., Hathi N.P., Haro P.A., Dickinson M., Koekemoer A.M., Papovich C., Pirzkal N., Aaron Yung L.Y., Backhaus B.E., Bell E.F., Calabrò A., Cleri N.J., Coogan R.T., Cooper M.C., Costantin L., Croton D., Davis K., Dekel A., Franco M., Gardner J.P., Holwerda B.W., Hutchison T.A., Pandya V., Pérez-González P.G., Ravindranath S., Rose C., Trump J.R., de la Vega A., Wang W. "First Look at z > 1 Bars in the

Rest-frame Near-infrared with JWST Early CEERS Imaging" Astrophysical Journal Letters, 945 (1), art. no. L10

Guzmán-Díaz J., Montesinos B., Mendigutía I., Kama M., Meeus G., Vioque M., Oudmaijer R.D., Villaver E. "Relation between metallicities and spectral energy distributions of Herbig Ae/Be stars: A potential link with planet formation" Astronomy and Astrophysics, 671, art. no. A140

Hallsworth J.E., Udaondo Z., Pedrós-Alió C., Höfer J., Benison K.C., Lloyd K.G., Cordero R.J.B., de Campos C.B.L., Yakimov M.M., Amils R. "Scientific novelty beyond the experiment" Microbial Biotechnology, 16 (6), pp. 1131 – 1173

Harada C.K., Dressing C.D., Alam M.K., Kirk J., López-Morales M., Ohno K., Akinsanmi B., Barros S.C.C., Buchhave L.A., Cameron A.C., Crossfield I.J.M., Dai F., Gao P., Giacalone S., Grouffal S., Lillo-Box J., Mayo A.W., Mortier A., Santerne A., Santos N.C., Sousa S.G., Turtelboom E.V., Vanderburg A., Wheatley P.J. "Stability and Detectability of Exomoons Orbiting HIP 41378 f, a Temperate Jovian Planet with an Anomalously Low Apparent Density" Astronomical Journal, 166 (5), art. no. 208

Harre J.-V., Smith A.M.S., Barros S.C.C., Boué G., Csizmadia Sz., Ehrenreich D., Florén H.-G., Fortier A., Maxted P.F.L., Hooton M.J., Akinsanmi B., Serrano L.M., Rosário N.M., Demory B.-O., Jones K., Laskar J., Adibekyan V., Alibert Y., Alonso R., Anderson D.R., Anglada G., Asquier J., Bárczy T., Y Navascues D.B., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Biondi F., Bonfanti A., Bonfils X., Brandeker A., Broeg C., Cabrera J., Cessa V., Charnoz S., Cameron A.C., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Erikson A., Fossati L., Fridlund M., Gandolfi D., Gillon M., Güdel M., Hellier C., Heng K., Hoyer S., Isaak K.G., Kiss L.L., Des Etangs A.L., Lendl M., Lovis C., Luntzer A., Magrin D., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Persson C.M., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Ricker G.R., Salmon S., Santos N.C., Scandariato G., Seager S., Ségransan D., Simon A.E., Sousa S.G., Steller M., Szabó Gy.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Walton N.A., Wilson T.G., Winn J.N., Wohler B. "Examining the orbital decay targets KELT-9 b, KELT-16 b, and WASP-4 b, and the transit-timing variations of HD 97658 b," Astronomy and Astrophysics, 669, art. no. A124

Hashimoto T., Álvarez-Márquez J., Fudamoto Y., Colina L., Inoue A.K., Nakazato Y., Ceverino D., Yoshida N., Costantin L., Sugahara Y., Gómez A.C., Blanco-Prieto C., Mawatari K., Arribas S., Marques-Chaves R., Pereira-Santaella M., Bakx T.J.L.C., Hagimoto M., Hashigaya T., Matsuo H., Tamura Y., Usui M., Ren Y.W. "Reionization and the ISM/Stellar Origins with JWST and ALMA (RIOJA): The Core of the Highest-redshift Galaxy Overdensity at z = 7.88 Confirmed by NIRSpec/JWST" Astrophysical Journal Letters, 955 (1), art. no. L2

Hausrath E.M., Adcock C.T., Bechtold A., Beck P., Benison K., Brown A., Cardarelli E.L., Carman N.A., Chide B., Christian J., Clark B.C., Cloutis E., Cousin A., Forni O., Gabriel T.S.J., Gasnault O., Golombek M., Gómez F., Hecht M.H., Henley T.L.J., Huidobro J., Johnson J., Jones M.W.M., Kelemen P., Knight A., Lasue J.A., Le Mouélic S., Madariaga J.M., Maki J., Mandon L., Martinez G., Martínez-Frías J., McConnochie T.H., Meslin P.-Y., Zorzano M.-P., Newsom H., Paar G., Randazzo N., Royer C., Siljeström S., Schmidt M.E., Schröder S., Sephton M.A., Sullivan R., Turenne N., Udry A., VanBommel S., Vaughan A., Wiens R.C., Williams N. “An Examination of Soil Crusts on the Floor of Jezero Crater, Mars” Journal of Geophysical Research: Planets, 128 (10), art. no. e2022JE007433

Hawthorn F., Bayliss D., Armstrong D.J., Fernández Fernández J., Osborn A., Sousa S.G., Adibekyan V., Davoult J., Collins K.A., Alibert Y., Barros S.C.C., Bouchy F., Brogi M., Ciardi D.R., Daylan T., Delgado Mena E., Demangeon O.D.S., Díaz R.F., Gan T., Horne K., Hoyer S., Jenkins J.M., Jensen E.L.N., Kielkopf J.F., Kostov V., Latham D.W., Levine A.M., Lillo-Box J., Nielsen L.D., Osborn H.P., Ricker G.R., Rodrigues J., Santos N.C., Schwarz R.P., Seager S., Serrano Bell J., Shporer A., Stockdale C., Strøm P.A., Tenenbaum P., Udry S., Wheatley P.J., Winn J.N., Ziegler C. “TOI-908: a planet at the edge of the Neptune desert transiting a G-type star” Monthly Notices of the Royal Astronomical Society, 524 (3), pp. 3877 – 3893

Hawthorn F., Bayliss D., Wilson T.G., Bonfanti A., Adibekyan V., Alibert Y., Sousa S.G., Collins K.A., Bryant E.M., Osborn A., Armstrong D.J., Abe L., Acton J.S., Addison B.C., Agabi K., Alonso R., Alves D.R., Anglada-Escudé G., Bárczy T., Barclay T., Barrado D., Barros S.C.C., Baumjohann W., Bendjoya P., Benz W., Bieryla A., Bonfils X., Bouchy F., Brandeker A., Broeg C., Brown D.J.A., Burleigh M.R., Buttu M., Cabrera J., Caldwell D.A., Casewell S.L., Charbonneau D., Charnoz S., Cloutier R., Cameron A.C., Collins K.I., Conti D.M., Crouzet N., Czismadia S., Davies M.B., Deleuil M., Delgado-Mena E., Delrez L., Demangeon O.D.S., Demory B.-O., Dransfield G., Dumusque X., Egger J.A., Ehrenreich D., Eigmüller P., Erickson A., Essack Z., Fortier A., Fossati L., Fridlund M., Günther M.N., Güdel M., Gandolfi D., Gillard H., Gillon M., Gnilka C., Goad M.R., Goeke R.F., Guillot T., Hadjigeorghiou A., Hellier C., Henderson B.A., Heng K., Hooton M.J., Horne K., Howell S.B., Hoyer S., Irwin J.M., Jenkins J.S., Jenkins J.M., Jensen E.L.N., Kane S.R., Kendall A., Kielkopf J.F., Kiss L.L., Lacedelli G., Laskar J., Latham D.W., des Etangs A.L., Leleu A., Lendl M., Lillo-Box J., Lovis C., Mékarnia D., Massey B., Masters T., Maxted P.F.L., Nascimbeni V., Nielsen L.D., O’Brien S.M., Olofsson G., Osborn H.P., Pagano I., Pallé E., Persson C.M., Piotto G., Plavchan P., Pollacco D., Queloz D., Ragazzoni R., Rauer H., Ribas I., Ricker G., Ségransan D., Salmon S., Santerne A., Santos N.C., Scandariato G., Schmider F.-X., Schwarz R.P., Seager S., Shporer A., Simon A.E., Smith A.M.S., Srdoc G., Steller M., Suarez O., Szabó G.M., Teske J., Thomas N., Tilbrook R.H., Triaud A.H.M.J., Udry S., Van Grootel V., Walton N., Wang S.X., Wheatley P.J., Winn J.N., Wittenmyer R.A., Zhang H. “TOI-836: A super-Earth and mini-Neptune transiting a nearby K-dwarf” Monthly Notices of the Royal Astronomical Society, 520 (3), pp. 3649 – 3668

Herkenhoff K.E., Sullivan R.J., Newman C.E., Paar G., Baker M., Viúdez-Moreiras D., Ashley J.W., Bechtold A., Nuñez J.I. “Comparison of Ventifact Orientations and Recent Wind Direction Indicators on the Floor of Jezero Crater, Mars” Journal of Geophysical Research: Planets, 128 (3), art. no. e2022JE007599

Herreros I., Hochberg D. “Chiral symmetry breaking and entropy production in Dean vortices” Physics of Fluids, 35 (4), art. no. 043614

Heydari E., Schroeder J.F., Calef F.J., Parker T.J., Fairén A.G. “Lacustrine sedimentation by powerful storm waves in Gale crater and its implications for a warming episode on Mars” Scientific Reports, 13 (1), art. no. 18715

Hidalgo-Arias A., Muñoz-Hisado V., Valles P., Geyer A., Garcia-Lopez E., Cid C. “Adaptation of the Endolithic Biome in Antarctic Volcanic Rocks” International Journal of Molecular Sciences, 24 (18), art. no. 13824

Hintz D., Peacock S., Barman T., Fuhrmeister B., Nagel E., Schweitzer A., Jeffers S.V., Ribas I., Reiners A., Quirrenbach A., Amado P.J., Béjar V.J.S., Caballero J.A., Hatzes A.P., Montes D. “Modeling the Chromosphere and Transition Region of Planet-hosting Star GJ 436” Astrophysical Journal, 954 (1), art. no. 73

Hochberg D., Buhse T., Micheau J.-C., Ribó J.M. “Chiral selectivity vs. noise in spontaneous mirror symmetry breaking” Physical Chemistry Chemical Physics, 25 (46), pp. 31583 – 31595

Hortelano C., Ruiz-Bermejo M., de la Fuente J.L. “Kinetic Study of the Effective Thermal Polymerization of a Prebiotic Monomer: Aminomalononitrile” Polymers, 15 (3), art. no. 486

Hourihane A., François P., Worley C.C., Magrini L., Gonneau A., Casey A.R., Gilmore G., Randich S., Sacco G.G., Recio-Blanco A., Korn A.J., Allende Prieto C., Smiljanic R., Blomme R., Bragaglia A., Walton N.A., Van Eck S., Bensby T., Lanzafame A., Frasca A., Franciosini E., Damiani F., Lind K., Bergemann M., Bonifacio P., Hill V., Lobel A., Montes D., Feuillet D.K., Tautvaišiene G., Guiglion G., Tabernero H.M., González Hernández J.I., Gebran M., Van Der Swaelmen M., Mikolaitis S., Daflon S., Merle T., Morel T., Lewis J.R., González Solares E.A., Murphy D.N.A., Jeffries R.D., Jackson R.J., Feltzing S., Prusti T., Carraro G., Biazzo K., Prisinzano L., Jofré P., Zaggia S., Drazdauskas A., Stonkuté E., Marfil E., Jiménez-Esteban F., Mahy L., Gutiérrez Albarrán M.L., Berlanas S.R., Santos W., Morbidelli L., Spina L., Minkevičiūte R. “The Gaia - ESO Survey: Homogenisation of stellar parameters and elemental abundances” Astronomy and Astrophysics, 676, art. no. A129

Huang K.-Y., Viti S., Holdship J., Mangum J.G., Martín S., Harada N., Muller S., Sakamoto K., Tanaka K., Yoshimura Y., Herrero-Illana R., Meier D.S., Behrens E., Van Der Werf P.P., Henkel C., García-Burillo S., Rivilla V.M., Emig K.L., Colzi L., Humire P.K., Aladro R., Bouvier M. “Reconstructing the shock history in the CMZ of NGC 253 with ALCHEMI” Astronomy and Astrophysics, 675, art. no. A151

Hueso R., Newman C.E., del Río-Gaztelurrutia T., Munguira A., Sánchez-Lavega A., Toledo D., Apéstigue V., Arruego I., Vicente-Retortillo A., Martínez G., Lemmon M., Lorenz R., Richardson M., Viudez-Moreiras D., de la Torre-Juarez M., Rodríguez-Manfredi J.A., Tamppari L.K., Murdoch N., Navarro-López S., Gómez-Elvira J., Baker M., Pla-García J., Harri A.M., Hieta M., Genzer M., Polkko J., Jaakonaho I., Makinen T., Stott A., Mimoun D., Chide B., Sebastian E., Banfield D., Lepinette-Malvite A. "Convective Vortices and Dust Devils Detected and Characterized by Mars 2020" Journal of Geophysical Research: Planets, 128 (2), art. no. e2022JE007516

Huidobro J., Madariaga J.M., Carrizo D., Laserna J.L., Rull F., Martínez-Frías J., Aramendia J., Sánchez-García L., García-Gómez L., Vignale F.A., Farías M.E., Veneranda M., Población I., Cabalín L.M., López-Reyes G., Coloma L., García-Florentino C., Arana G., Castro K., Delgado T., Álvarez-Llamas C., Fortes F.J., Manrique J.A. "Multi-analytical characterization of an oncoid from a high altitude hypersaline lake using techniques employed in the Mars2020 and Rosalind Franklin missions on Mars" Analytica Chimica Acta, 1276, art. no. 341632

Iglesias D.P., Panić O., Rebollido I. "Gas absorption towards the η Tel debris disc: Winds or clouds?" Monthly Notices of the Royal Astronomical Society, 526 (2), pp. 2500 – 2505

Iovino A., Poggianti B.M., Mercurio A., Longhetti M., Bolzonella M., Busarello G., Gullieuszik M., La Barbera F., Merluzzi P., Morelli L., Tortora C., Vergani D., Zibetti S., Haines C.P., Costantin L., Ditrani F.R., Pozzetti L., Angthopo J., Balcells M., Bardelli S., Benn C.R., Bianconi M., Cassarà L.P., Corsini E.M., Cucciati O., Dalton G., Ferré-Mateu A., Fossati M., Gallazzi A., García-Benito R., Granett B., González Delgado R.M., Ikhsanova A., Iodice E., Jin S., Knapen J.H., Mcgee S., Moretti A., Murphy D.N.A., Peralta De Arriba L., Pizzella A., Sánchez-Blázquez P., Spiniello C., Talia M., Trager S.C., Vazdekis A., Vulcani B., Zucca E. "WEAVE-StePS: A stellar population survey using WEAVE at WHT" Astronomy and Astrophysics, 672, art. no. A87

Jaakonaho I., Hieta M., Genzer M., Polkko J., Mäkinen T., Sánchez-Lavega A., Hueso R., del Río-Gaztelurrutia T., Harri A.-M., Haukka H., de la Torre Juárez M., Rodríguez-Manfredi J.A. "Pressure sensor for the Mars 2020 Perseverance rover" Planetary and Space Science, 239, art. no. 105815

Jiménez-Esteban F.M., Torres S., Rebassa-Mansergas A., Cruz P., Murillo-Ojeda R., Solano E., Rodrigo C., Camisassa M.E. "Spectral classification of the 100 pc white dwarf population from Gaia-DR3 and the virtual observatory" Monthly Notices of the Royal Astronomical Society, 518 (4), pp. 5106 – 5122

Jones O.C., Álvarez-Márquez J., Sloan G.C., Kavanagh P.J., Argyriou I., Law D.R., Labiano A., Patapis P., Mueller M., Larson K.L., Bright S.N., Klaassen P.D., Fox O.D., Gasman D., Geers V.C., Glauser A.M., Guillard P., Nayak O., Noriega-Crespo A., Ressler M.E., Sargent B., Temim T., Vandenbussche B., García Marín M. "Observations of the planetary nebula SMP LMC 058 with the JWST MIRI medium resolution spectrometer" Monthly Notices of the Royal Astronomical Society, 523 (2), pp. 2519 – 2529

Jones O.C., Kavanagh P.J., Barlow M.J., Temim T., Fransson C., Larsson J., Blommaert J.A.D.L., Meixner M., Lau R.M., Sargent B., Bouchet P., Hjorth J., Wright G.S., Coulais A., Fox O.D., Gastaud R., Glasse A., Habel N., Hirschauer A.S., Jaspers J., Krause O., Lenkić L., Nayak O., Rest A., Tikkanen T., Wesson R., Colina L., van Dishoeck E.F., Güdel M., Henning T., Lagage P.-O., Östlin G., Ray T.P., Vandenbussche B. "Ejecta, Rings, and Dust in SN 1987A with JWST MIRI/MRS" Astrophysical Journal, 958 (1), art. no. 95

Joyce S.R.G., Pye J.P., Nichols J.D., Alexander R., Güdel M., Barrado D. "X-ray and UV radiation in the planet-forming T-Tauri system PDS 70. Signs of accretion and coronal activity" Monthly Notices of the Royal Astronomical Society, 519 (3), pp. 4514 – 4528

Kakkad D., Mainieri V., Vietri G., Lamperti I., Carniani S., Cresci G., Harrison C., Marconi A., Bischetti M., Cicone C., Circosta C., Husemann B., Man A., Mannucci F., Netzer H., Padovani P., Perna M., Puglisi A., Scholtz J., Tozzi G., Vignali C., Zappacosta L. "SUPER VII. morphology and kinematics of H α emission in AGN host galaxies at cosmic noon using SINFONI" Monthly Notices of the Royal Astronomical Society, 520 (4), pp. 5783 – 5802

Kamp I., Henning T., Arabhavi A.M., Bettoni G., Christiaens V., Gasman D., Grant S.L., Morales-Calderón M., Tabone B., Abergel A., Absil O., Argyriou I., Barrado D., Boccaletti A., Bouwman J., Caratti o Garatti A., van Dishoeck E.F., Geers V., Glauser A.M., Güdel M., Guadarrama R., Jang H., Kanwar J., Lagage P.-O., Lahuis F., Mueller M., Nehmé C., Olofsson G., Pantin E., Pawellek N., Perotti G., Ray T.P., Rodgers-Lee D., Samland M., Scheithauer S., Schreiber J., Schwarz K., Temmink M., Vandenbussche B., Vlasblom M., Waelkens C., Waters L.B.F.M., Wright G. "The chemical inventory of the inner regions of planet-forming disks - the JWST/MINDS program" Faraday Discussions, 245, pp. 112 – 137

Kartaltepe J.S., Rose C., Vanderhoof B.N., McGrath E.J., Costantin L., Cox I.G., Aaron Yung L.Y., Kocevski D.D., Wuyts S., Ferguson H.C., Bagley M.B., Finkelstein S.L., Amorín R.O., Andrews B.H., Haro P.A., Backhaus B.E., Behroozi P., Bisigello L., Calabrò A., Casey C.M., Coogan R.T., Cooper M.C., Croton D., de la Vega A., Dickinson M., Fontana A., Franco M., Grazian A., Grogin N.A., Hathi N.P., Holwerda B.W., Huertas-Company M., Iyer K.G., Jogee S., Jung I., Kewley L.J., Kirkpatrick A., Koekemoer A.M., Liu J., Lotz J.M., Lucas R.A., Newman J.A., Pacifici C., Pandya V., Papovich C., Pentericci L., Pérez-González P.G., Petersen J., Pirzkal N., Rafelski M., Ravindranath S., Simons R.C., Snyder G.F., Somerville R.S., Stanway E.R., Straughn A.N., Tacchella S., Trump J.R., Vega-Ferrero J., Wilkins S.M., Yang G., Zavala J.A. "CEERS Key Paper. III. The Diversity of Galaxy Structure and Morphology at z = 3-9 with JWST" Astrophysical Journal Letters, 946 (1), art. no. L15

Katsioli S., Xilouris E.M., Kramer C., Adam R., Ade P., Ajeddig H., André P., Artis E., Aussel H., Baes M., Beelen A., Benoît A., Berta S., Bing L., Bourrion O., Calvo M., Catalano A., Clark C.J.R., De Looze I., De Petris M., Désert F.-X., Doyle S., Driessen E.F.C., Ejlali G., Galametz M., Galliano F., Gomez A., Goupy J., Hanser C., Hughes A., Jones A.P., Kéruzoré F., Ladjelate B., Lagache G., Leclercq S., Lestrade J.-F., MacÍas-Pérez J.-F., Madden S.C., Maury A., Mauskopf P., Mayet F., Monfardini A., Muñoz-Echeverría M., Nersesian A., Pantoni L., Paradis D., Perotto L., Pisano G., Ponthieu N., Revéret V., Rigby A.J., Ritacco A., Romero C., Roussel H., Ruppin F., Schuster K., Sievers A., Smith M.W.L., Tedros J., Tabatabaei F., Tucker C., Ysard N., Zylka R. "The stratification of ISM properties in the edge-on galaxy NGC 891 revealed by NIKA2" Astronomy and Astrophysics, 679, art. no. A7

Katz H., Saxena A., Cameron A.J., Carniani S., Bunker A.J., Arribas S., Bhatawdekar R., Bowler R.A.A., Boyett K.N.K., Cresci G., Curtis-Lake E., D'Eugenio F., Kumari N., Looser T.J., Maiolino R., Übler H., Willott C., Witstok J. "First insights into the ISM at z > 8 with JWST: Possible physical implications of a high [O iii] λ4363/[O iii] λ5007" Monthly Notices of the Royal Astronomical Society, 518 (1), pp. 592 – 603

Kiefer F., Van Grootel V., Lecavelier Des Etangs A., Szabó G.M., Brandeker A., Broeg C., Collier Cameron A., Deline A., Olofsson G., Wilson T.G., Sousa S.G., Gandolfi D., Hébrard G., Alibert Y., Alonso R., Anglada G., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Bonfils X., Cabrera J., Charnoz S., Csizmadia S., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Fortier A., Fossati L., Fridlund M., Gillon M., Güdel M., Heng K., Hoyer S., Isaak K.G., Kiss L.L., Laskar J., Lendl M., Lovis C., Magrin D., Maxted P.F.L., Munari M., Nascimbeni V., Ottensamer R., Pagano I., Pallé E., Peter G., Piazza D., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Ratti F., Rauer H., Reimers C., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Thomas N., Udry S., Walter I., Walton N.A. "Hint of an exocomet transit in the CHEOPS light curve of HD 172555" Astronomy and Astrophysics, 671, art. no. A25

Kirkpatrick A., Yang G., Le Bail A., Troiani G., Bell E.F., Cleri N.J., Elbaz D., Finkelstein S.L., Hathi N.P., Hirschmann M., Holwerda B.W., Kocevski D.D., Lucas R.A., McKinney J., Papovich C., Pérez-González P.G., de la Vega A., Bagley M.B., Daddi E., Dickinson M., Ferguson H.C., Fontana A., Grazian A., Grogin N.A., Haro P.A., Kartaltepe J.S., Kewley L.J., Koekemoer A.M., Lotz J.M., Pentericci L., Pirzkal N., Ravindranath S., Somerville R.S., Trump J.R., Wilkins S.M., Yung L.Y.A. "CEERS Key Paper. VII. JWST/MIRI Reveals a Faint Population of Galaxies at Cosmic Noon Unseen by Spitzer" Astrophysical Journal Letters, 959 (1), art. no. L7

Kocevski D.D., Barro G., McGrath E.J., Finkelstein S.L., Bagley M.B., Ferguson H.C., Jogee S., Yang G., Dickinson M., Hathi N.P., Backhaus B.E., Bell E.F., Bisigello L., Buat V., Burgarella D., Casey C.M., Cleri N.J., Cooper M.C., Costantin L., Croton D., Daddi E., Fontana A., Fujimoto S., Gardner J.P., Gawiser E., Giavalisco M., Grazian A., Grogin N.A., Guo Y., Haro P.A., Hirschmann M., Holwerda B.W., Huertas-Company M., Hutchison T.A., Iyer K.G., Jones B., Juneau S., Kartaltepe J.S., Kewley L.J., Kirkpatrick A., Koekemoer A.M., Kurczynski P., Bail A.L., Long A.S., Lotz J.M., Lucas R.A., Papovich C., Pentericci L., Pérez-González P.G., Pirzkal N., Rafelski M., Ravindranath S., Somerville R.S., Straughn A.N., Tacchella S., Trump J.R., Wilkins S.M., Wuyts S., Aaron Yung L.Y., Zavala J.A. “CEERS Key Paper. II. A First Look at the Resolved Host Properties of AGN at 3 < z < 5 with JWST” Astrophysical Journal Letters, 946 (1), art. no. L14

Kodra D., Andrews B.H., Newman J.A., L. Finkelstein S., Fontana A., Hathi N., Salvato M., Wiklind T., Wuyts S., Broussard A., Chartab N., Conselice C., Cooper M.C., Dekel A., Dickinson M., Ferguson H.C., Gawiser E., Grogin N.A., Iyer K., Kartaltepe J., Kassin S., Koekemoer A.M., Koo D.C., Lucas R.A., Mantha K.B., McIntosh D.H., Mobasher B., Pacifici C., Pérez-González P.G., Santini P. “Optimized Photometric Redshifts for the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS)” Astrophysical Journal, 942 (1), art. no. 36

Kossakowski D., Kürster M., Trifonov T., Henning T., Kemmer J., Caballero J.A., Burn R., Sabotta S., Crouse J.S., Fauchez T.J., Nagel E., Kaminski A., Herrero E., Rodríguez E., González-Álvarez E., Quirrenbach A., Amado P.J., Ribas I., Reiners A., Aceituno J., Béjar V.J.S., Baroch D., Bastelberger S.T., Chaturvedi P., Cifuentes C., Dreizler S., Jeffers S.V., Kopparapu R., Lafarga M., López-González M.J., Martín-Ruiz S., Montes D., Morales J.C., Pallé E., Pavlov A., Pedraz S., Perdelwitz V., Pérez-Torres M., Perger M., Reffert S., Rodríguez López C., Schlecker M., Schöfer P., Schweitzer A., Shan Y., Shields A., Stock S., Wolf E., Zapatero Osorio M.R., Zechmeister M. “The CARMENES search for exoplanets around M dwarfs: Wolf 1069 b: Earth-mass planet in the habitable zone of a nearby, very low-mass star” Astronomy and Astrophysics, 670, art. no. A84

Krenn A.F., Lendl M., Patel J.A., Carone L., Deleuil M., Sulis S., Collier Cameron A., Deline A., Guterman P., Queloz D., Fossati L., Brandeker A., Heng K., Akinsanmi B., Adibekyan V., Bonfanti A., Demangeon O.D.S., Kitzmann D., Salmon S., Sousa S.G., Wilson T.G., Alibert Y., Alonso R., Anglada G., Bárczy T., Barrado Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Blecha L., Bonfils X., Borsato L., Broeg C., Cabrera J., Charnoz S., Corral Van Damme C., Csizmadia S., Cubillos P.E., Davies M.B., Delrez L., Demory B.-O., Ehrenreich D., Erikson A., Farinato J., Fortier A., Fridlund M., Gandolfi D., Gillon M., Güdel M., Hoyer S., Isaak K.G., Kiss L.L., Kopp E., Laskar J., Lecavelier Des Etangs A., Lovis C., Magrin D., Maxted P.F.L., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Venturini J., Walton N.A. “The geometric albedo of the hot Jupiter HD 189733b measured with CHEOPS” Astronomy and Astrophysics, 672, art. no. A24

Kumar D., Dominguez-Pumar M., Sayrol-Clols E., Torres J., Marín M., Gómez-Elvira J., Mora L., Navarro S., Rodríguez-Manfredi J. “Improving resilience of sensors in planetary exploration using data-driven models” Machine Learning: Science and Technology, 4 (3), art. no. 035041

Lafarga M., Ribas I., Zechmeister M., Reiners A., López-Gallifa Á., Montes D., Quirrenbach A., Amado P.J., Caballero J.A., Azzaro M., Béjar V.J.S., Hatzes A.P., Henning T., Jeffers S.V., Kaminski A., Kürster M., Schöfer P., Schweitzer A., Tabernero H.M., Osorio M.R.Z. "The CARMENES search for exoplanets around M dwarfs: Line-by-line sensitivity to activity in M dwarfs" Astronomy and Astrophysics, 674, art. no. A61

Laguna-Castro M., Rodríguez-Moreno A., Llorente E., Lázaro E. "The balance between fitness advantages and costs drives adaptation of bacteriophage Qβ to changes in host density at different temperatures" Frontiers in Microbiology, 14, art. no. 1197085

Lam K.W.F., Cabrera J., Hooton M.J., Alibert Y., Bonfanti A., Beck M., Deline A., Floren H.-G., Simon A.E., Fossati L., Persson C.M., Fridlund M., Salmon S., Hoyer S., Osborn H.P., Wilson T.G., Georgieva I.Y., Nowak G., Luque R., Egger J.A., Adibekyan V., Alonso R., Escude G.A., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck T., Bekkelien A., Benz W., Billot N., Bonfils X., Brandeker A., Broeg C., Charnoz S., Cameron A.C., Csizmadia S., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Fortier A., Futyan D., Gandolfi D., Gillon M., Guedel M., Guterman P., Laskar J., Latham D.W., Lecavelier Des Etangs A., Lendl M., Lovis C., Heng K., Isaak K.G., Kiss L., Magrin D., Maxted P.F.L., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Palle E., Peter G., Piotto G., Pollacco D., Queloz D., Ribas I., Ragazzoni R., Rando N., Rauer H., Santos N.C., Scandariato G., Seager S., Segransan D., Serrano L.M., Smith A.M.S., Sousa S.G., Steller M., Szabó G.M., Thomas N., Udry S., Van Grootel V., Walton N.A., Winn J.N. "Discovery of TOI-1260d and the characterization of the multiplanet system" Monthly Notices of the Royal Astronomical Society, 519 (1), pp. 1437 – 1451

Lampón M., López-Puertas M., Sanz-Forcada J., Czesla S., Nortmann L., Casasayas-Barris N., Orell-Miquel J., Sánchez-López A., Danielski C., Pallé E., Molaverdikhani K., Henning T., Caballero J.A., Amado P.J., Quirrenbach A., Reiners A., Ribas I. "Characterisation of the upper atmospheres of HAT-P-32 b, WASP-69 b, GJ 1214 b, and WASP-76 b through their He i triplet absorption" Astronomy and Astrophysics, 673, art. no. A140

Landstreet J.D., Villaver E., Bagnulo S. "Not So Fast, Not So Furious: Just Magnetic" Astrophysical Journal, 952 (2), art. no. 129

Larson R.L., Finkelstein S.L., Kocevski D.D., Hutchison T.A., Trump J.R., Haro P.A., Bromm V., Cleri N.J., Dickinson M., Fujimoto S., Kartaltepe J.S., Koekemoer A.M., Papovich C., Pirzkal N., Tacchella S., Zavala J.A., Bagley M., Behroozi P., Champagne J.B., Cole J.W., Jung I., Morales A.M., Yang G., Zhang H., Zitrin A., Amorín R.O., Burgarella D., Casey C.M., Chávez Ortiz Ó.A., Cox I.G., Chworowsky K., Fontana A., Gawiser E., Grazian A., Grogin N.A., Harish S., Hathi N.P., Hirschmann M., Holwerda B.W., Juneau S., Leung G.C.K., Lucas R.A., McGrath E.J., Pérez-González P.G., Rigby J.R., Seillé L.-M., Simons R.C., De La Vega A., Weiner B.J., Wilkins S.M., Yung L.Y.A. "A CEERS Discovery of an Accreting Supermassive Black Hole 570 Myr after the

Big Bang: Identifying a Progenitor of Massive z > 6 Quasars" Astrophysical Journal Letters, 953 (2), art. no. L29

Lavie B., Bouchy F., Lovis C., Zapatero Osorio M., Deline A., Barros S., Figueira P., Sozzetti A., González Hernández J.I., Lillo-Box J., Rodrigues J., Mehner A., Damasso M., Adibekyan V., Alibert Y., Allende Prieto C., Cristiani S., DâÂÂ Odorico V., Di Marcantonio P., Ehrenreich D., Génova Santos R., Lo Curto G., Martins C.J.A.P., Micela G., Molaro P., Nunes N., Palle E., Pepe F., Poretti E., Rebolo R., Santos N., Sousa S., Suárez Mascareño A., Tabrenero H., Udry S. "Planetary system around LTT 1445A unveiled by ESPRESSO: Multiple planets in a triple M-dwarf system" Astronomy and Astrophysics, 673, art. no. A69

Lebowitz S., Emonts B., Terndrup D.M., Burchett J.N., Prochaska J.X., Drouart G., Villar-Martín M., Lehnert M., De Breuck C., Vernet J., Alatalo K. "The Dragonfly Galaxy. III. Jet Brightening of a High-redshift Radio Source Caught in a Violent Merger of Disk Galaxies" Astrophysical Journal, 951 (1), art. no. 73

Leino J., Harri A.-M., Banfield D., de la Torre Juárez M., Paton M., Rodriguez-Manfredi J.-A., Lemmon M., Savijärvi H. "Martian Equatorial Atmospheric Tides From Surface Observations" Journal of Geophysical Research: Planets, 128 (10), art. no. e2023JE007957

Leung G.C.K., Bagley M.B., Finkelstein S.L., Ferguson H.C., Koekemoer A.M., Pérez-González P.G., Morales A., Kocevski D.D., Yang G., Somerville R.S., Wilkins S.M., Yung L.Y.A., Fujimoto S., Larson R.L., Papovich C., Pirzkal N., Berg D.A., Lotz J.M., Castellano M., Chávez Ortiz I.A., Cheng Y., Dickinson M., Giavalisco M., Hathi N.P., Hutchison T.A., Jung I., Kartaltepe J.S., Natarajan P., Rothberg B. "NGDEEP Epoch 1: The Faint End of the Luminosity Function at z ∼ 9-12 from Ultradeep JWST Imaging" Astrophysical Journal Letters, 954 (2), art. no. L46

Li J.-Y., Hirabayashi M., Farnham T.L., Sunshine J.M., Knight M.M., Tancredi G., Moreno F., Murphy B., Opitom C., Chesley S., Scheeres D.J., Thomas C.A., Fahnestock E.G., Cheng A.F., Dressel L., Ernst C.M., Ferrari F., Fitzsimmons A., Ieva S., Ivanovski S.L., Kareta T., Kolokolova L., Lister T., Raducan S.D., Rivkin A.S., Rossi A., Soldini S., Stickle A.M., Vick A., Vincent J.-B., Weaver H.A., Bagnulo S., Bannister M.T., Cambioni S., Campo Bagatin A., Chabot N.L., Cremonese G., Daly R.T., Dotto E., Glenar D.A., Granvik M., Hasselmann P.H., Herreros I., Jacobson S., Jutzi M., Kohout T., La Forgia F., Lazzarin M., Lin Z.-Y., Lolachi R., Lucchetti A., Makadia R., Mazzotta Epifani E., Michel P., Migliorini A., Moskovitz N.A., Ormö J., Pajola M., Sánchez P., Schwartz S.R., Snodgrass C., Steckloff J., Stubbs T.J., Trigo-Rodríguez J.M. "Ejecta from the DART-produced active asteroid Dimorphos" Nature, 616 (7957), pp. 452 – 456

Libralato M., Bellini A., Van Der Marel R.P., Anderson J., Sohn S.T., Watkins L.L., Alderson L., Allen N., Clampin M., Glidden A., Goyal J., Hoch K., Huang J., Kammerer J., Lewis N.K., Lin Z., Long D., Louie D., Macdonald R.J., Mountain M., Peña-Guerrero M., Perrin M.D., Pueyo L., Rebollido I., Rickman E., Seager S., Stevenson K.B., Valenti J.A., Valentine D., Wakeford H.R. "JWST-TST Proper Motions. I. High-precision NIRISS Calibration and Large Magellanic Cloud Kinematics" Astrophysical Journal, 950 (2), art. no. 101

Lillo-Box J., Gandolfi D., Armstrong D.J., Collins K.A., Nielsen L.D., Luque R., Korth J., Sousa S.G., Quinn S.N., Acuña L., Howell S.B., Morello G., Hellier C., Giacalone S., Hoyer S., Stassun K., Palle E., Aguichine A., Mousis O., Adibekyan V., Silva T.A., Barrado D., Deleuil M., Eastman J.D., Fukui A., Hawthorn F., Irwin J.M., Jenkins J.M., Latham D.W., Muresan A., Narita N., Persson C.M., Santerne A., Santos N.C., Savel A.B., Osborn H.P., Teske J., Wheatley P.J., Winn J.N., Barros S.C.C., Butler R.P., Caldwell D.A., Charbonneau D., Cloutier R., Crane J.D., Demangeon O.D.S., Díaz R.F., Dumusque X., Esposito M., Falk B., Gill H., Hojjatpanah S., Kreidberg L., Mireles I., Osborn A., Ricker G.R., Rodriguez J.E., Schwarz R.P., Seager S., Bell J.S., Shectman S.A., Shporer A., Vezie M., Wang S.X., Zhou G. "TOI-969: a late-K dwarf with a hot mini-Neptune in the desert and an eccentric cold Jupiter" Astronomy and Astrophysics, 669, art. no. A109

López-Cayuela M.A., Córdoba-Jabonero C., Bermejo-Pantaleón D., Sicard M., Salgueiro V., Molero F., Carvajal-Pérez C.V., Granados-Muñoz M.J., Comerón A., Couto F.T., Barragán R., Zorzano M.-P., Bravo-Aranda J.A., Muñoz-Porcar C., Costa M.J., Artíñano B., Rodríguez-Gómez A., Bortoli D., Pujadas M., Abril-Gago J., Alados-Arboledas L., Guerrero-Rascado J.L. "Vertical characterization of fine and coarse dust particles during an intense Saharan dust outbreak over the Iberian Peninsula in springtime 2021" Atmospheric Chemistry and Physics, 23 (1), pp. 143 – 161

Luque R., Osborn H.P., Leleu A., Pallé E., Bonfanti A., Barragán O., Wilson T.G., Broeg C., Cameron A.C., Lendl M., Maxted P.F.L., Alibert Y., Gandolfi D., Delisle J.-B., Hooton M.J., Egger J.A., Nowak G., Lafarga M., Rapetti D., Twicken J.D., Morales J.C., Carleo I., Orell-Miquel J., Adibekyan V., Alonso R., Alqasim A., Amado P.J., Anderson D.R., Anglada-Escudé G., Bandy T., Bárczy T., Barrado Navascues D., Barros S.C.C., Baumjohann W., Bayliss D., Bean J.L., Beck M., Beck T., Benz W., Billot N., Bonfils X., Borsato L., Boyle A.W., Brandeker A., Bryant E.M., Cabrera J., Carrazco-Gaxiola S., Charbonneau D., Charnoz S., Ciardi D.R., Cochran W.D., Collins K.A., Crossfield I.J.M., Csizmadia S., Cubillos P.E., Dai F., Davies M.B., Deeg H.J., Deleuil M., Deline A., Delrez L., Demangeon O.D.S., Demory B.-O., Ehrenreich D., Erikson A., Esparza-Borges E., Falk B., Fortier A., Fossati L., Fridlund M., Fukui A., Garcia-Mejia J., Gill S., Gillon M., Goffo E., Gómez Maqueo Chew Y., Güdel M., Guenther E.W., Günther M.N., Hatzes A.P., Helling C., Hesse K.M., Howell S.B., Hoyer S., Ikuta K., Isaak K.G., Jenkins J.M., Kagetani T., Kiss L.L., Kodama T., Korth J., Lam K.W.F., Laskar J., Latham D.W., Lecavelier des Etangs A., Leon J.P.D., Livingston J.H., Magrin D., Matson R.A., Matthews E.C., Mordasini C., Mori M., Moyano M., Munari M., Murgas F., Narita N., Nascimbeni V., Olofsson G., Osborne H.L.M., Ottensamer R., Pagano I., Parviainen H., Peter G., Piotto G., Pollacco D., Queloz D., Quinn S.N., Quirrenbach A., Ragazzoni R., Rando N., Ratti F., Rauer H., Redfield S., Ribas I., Ricker G.R., Rudat A., Sabin L., Salmon S., Santos N.C., Scandariato G., Schanche N., Schlieder J.E., Seager S., Ségransan D., Shporer A., Simon A.E., Smith A.M.S., Sousa S.G., Stalport M., Szabó G.M., Thomas N., Tuson A., Udry S., Vanderburg A.M., Van Eylen V., Van Grootel V., Venturini J., Walter I., Walton N.A., Watanabe N., Winn J.N., Zingales T. "A resonant sextuplet of sub-Neptunes transiting the bright star HD 110067" Nature, 623 (7989), pp. 932 – 937

Maggio A., Pillitteri I., Argiroffi C., Benatti S., Sanz-Forcada J., D'Orazi V., Biazzo K., Borsa F., Cabona L., Claudi R., Desidera S., Locci D., Nardiello D., Mancini L., Micela G., Rainer M., Spinelli R., Bignamini A., Damasso M. "X-Ray and Ultraviolet Emission of the Young Planet-hosting Star V1298 Tau from Coordinated Observations with XMM-Newton and Hubble Space Telescope" Astrophysical Journal, 951 (1), art. no. 18

Magnelli B., Gómez-Guijarro C., Elbaz D., Daddi E., Papovich C., Shen L., Arrabal Haro P., Bagley M.B., Bell E.F., Buat V., Costantin L., Dickinson M., Finkelstein S.L., Gardner J.P., Jiménez-Andrade E.F., Kartaltepe J.S., Koekemoer A.M., Lyu Y., Pérez-González P.G., Pirzkal N., Tacchella S., De La Vega A., Wuyts S., Yang G., Aaron Yung L.Y., Zavala J. "CEERS: MIRI deciphers the spatial distribution of dust-obscured star formation in galaxies at $0.1 < z < 2.5$" Astronomy and Astrophysics, 678, art. no. A83

Maire A.-L., Delrez L., Pozuelos F.J., Becker J., Espinoza N., Lillo-Box J., Revol A., Absil O., Agol E., Almenara J.M., Anglada-Escudé G., Beust H., Blunt S., Bolmont E., Bonavita M., Brandner W., Brandt G.M., Brandt T.D., Brown G., Mitjans C.C., Charalambous C., Chauvin G., Correia A.C.M., Cranmer M., Defrère D., Deleuil M., Demory B.-O., De Rosa R.J., Desidera S., Dévora-Pajares M., Díaz R.F., Clarissa Do Ó., Ducrot E., Dupuy T.J., Ferrer-Chávez R., Fontanive C., Gillon M., Giuppone C., Gkouvelis L., de Oliveira Gomes G., Gomes S.R.A., Günther M.N., Hadden S., Han Y., Hernandez D.M., Jehin E., Kane S.R., Kervella P., Kiefer F., Konopacky Q.M., Langlois M., Lanssens B., Lazzoni C., Lendl M., Li Y., Libert A.-S., Lovos F., Miculán R.G., Murray Z., Pallé E., Rein H., Rodet L., Roisin A., Sahlmann J., Siverd R., Stalport M., Suárez J.C., Tamayo D., Teyssandier J., Thuillier A., Timmermans M., Triaud A.H.M.J., Trifonov T., Valente E.F.S., Van Grootel V., Vasist M., Wang J.J., Wyatt M.C., Xuan J., Young S., Zimmerman N.T. "Workshop Summary: Exoplanet Orbits and Dynamics" Publications of the Astronomical Society of the Pacific, 135 (1052), art. no. 106001

Maíz Apellániz J., Holgado G., Pantaleoni González M., Caballero J.A. "Stellar variability in Gaia DR3: I. Three-band photometric dispersions for 145 million sources" Astronomy and Astrophysics, 677, art. no. A137

Mallorquín M., Béjar V.J.S., Lodieu N., Zapatero Osorio M.R., Tabernero H., Suárez Mascareño A., Zechmeister M., Luque R., Pallé E., Montes D. "Dynamical masses of two young transiting sub-Neptunes orbiting HD 63433" Astronomy and Astrophysics, 671, art. no. A163

Mallorquín M., Goffo E., Pallé E., Lodieu N., Béjar V.J.S., Isaacson H., Zapatero Osorio M.R., Dreizler S., Stock S., Luque R., Murgas F., Peña L., Sanz-Forcada J., Morello G., Ciardi D.R., Furlan E., Collins K.A., Herrero E., Vanaverbeke S., Plavchan P., Narita N., Schweitzer A., Pérez-Torres M., Quirrenbach A., Kemmer J., Hatzes A.P., Howard A., Schlecker M., Reffert S., Nagel E., Morales J.C., Orell-Miquel J., Duque-Arribas C., Carleo I., Cifuentes C., Nowak G., Ribas I., Reiners A., Amado P.J., Caballero J.A., Henning Th., Pinter V., Akana Murphy J.M., Beard C., Blunt S., Brinkman C.L., Cale B., Chontos A., Collins K.I., Crossfield I.J.M., Dai F., Dalba P.A., Dufoer S., El Mufti M., Espinoza N., Fetherolf T., Fukui A., Giacalone S., Gnilka C., Gonzales E., Grunblatt S.K., Howell S., Huber D., Kane S.R., de León J.P., Lubin J., MacDougall M.G., Massey B., Montes D., Mori M., Parviainen H., Passegger V.M., Polanski A.S., Robertson P., Schwarz R.P., Srdoc G., Tabernero H.M., Tanner A., Turtelboom E., Van Zandt J., Weiss L., Zechmeister M. “TOI-1801 b: A temperate mini-Neptune around a young M0.5 dwarf” Astronomy and Astrophysics, 680, art. no. A76

Mansilla F., Zorzano M.-P., Giannakis I., Ruiz J. “Unveiling the Subsurface of Late Amazonian Lava Flows at Echus Chasma, on Mars” Remote Sensing, 15 (5), art. no. 1357

Marino A., Franchi F., Lebogang L., Gomez F.J., Azua-Bustos A., Cavalazzi B., Balcha E., Lynch K., Bhagwat S.A., Olsson-Francis K. “Ethical considerations for analogue fieldwork in extreme environments” Nature Astronomy, 7 (9), pp. 1031 – 1036

Marshall J.P., Ertel S., Birtcil E., Villaver E., Kemper F., Boffin H., Scicluna P., Kamath D. “Evidence for the Disruption of a Planetary System During the Formation of the Helix Nebula” Astronomical Journal, 165 (1), art. no. 22

Marshall M.A., Perna M., Willott C.J., Maiolino R., Scholtz J., Übler H., Carniani S., Arribas S., Lützgendorf N., Bunker A.J., Charlot S., Ferruit P., Jakobsen P., Rix H.-W., Rodríguez Del Pino B., Böker T., Cameron A.J., Cresci G., Curtis-Lake E., Jones G.C., Kumari N., Pérez-González P.G., Reed S.L. “GA-NIFS: Black hole and host galaxy properties of two z-6.8 quasars from the NIRSpec IFU” Astronomy and Astrophysics, 678, art. no. A191

Martínez G.M., Sebastián E., Vicente-Retortillo A., Smith M.D., Johnson J.R., Fischer E., Savijärvi H., Toledo D., Hueso R., Mora-Sotomayor L., Gillespie H., Munguira A., Sánchez-Lavega A., Lemmon M.T., Gómez F., Polkko J., Mandon L., Apéstigue V., Arruego I., Ramos M., Conrad P., Newman C.E., Torre-Juarez M.D.L., Jordan F., Tamppari L.K., McConnochie T.H., Harri A.-M., Genzer M., Hieta M., Zorzano M.-P., Siegler M., Prieto O., Molina A., Rodríguez-Manfredi J.A. “Surface Energy Budget, Albedo, and Thermal Inertia at Jezero Crater, Mars, as Observed From the Mars 2020 MEDA Instrument” Journal of Geophysical Research: Planets, 128 (2), art. no. e2022JE007537

Martínez-González B., Gallego I., Gregori J., Soria M.E., Somovilla P., de Ávila A.I., García-Crespo C., Durán-Pastor A., Briones C., Gómez J., Quer J., Domingo E., Perales C. “Fitness-Dependent, Mild Mutagenic Activity of Sofosbuvir for Hepatitis C Virus” Antimicrobial Agents and Chemotherapy, 67 (7)

Martínez-Henares A., Jiménez-Serra I., Martín-Pintado J., Huélamo N., Prasad S., Zhang Q., Moran J., Cao Y., Báez-Rubio A. “Modeling of the High-velocity Jet Powered by the Massive Star MWC 349A” Astrophysical Journal, 955 (2), art. no. 119

Martínez-Periñán E., Domínguez-Saldaña A., Villa-Manso A.M., Gutiérrez-Sánchez C., Revenga-Parra M., Mateo-Martí E., Pariente F., Lorenzo E. “Azure A embedded in carbon dots as NADH electrocatalyst: Development of a glutamate electrochemical biosensor” Sensors and Actuators B: Chemical, 374, art. no. 132761

Mascaeño A.S., González-Álvarez E., Osorio M.R.Z., Lillo-Box J., Faria J.P., Passegger V.M., Hernández J.I.G., Figueira P., Sozzetti A., Rebolo R., Pepe F., Santos N.C., Cristiani S., Lovis C., Silva A.M., Ribas I., Amado P.J., Caballero J.A., Quirrenbach A., Reiners A., Zechmeister M., Adibekyan V., Alibert Y., Béjar V.J.S., Benatti S., D' Odorico V., Damasso M., Delisle J.-B., Di Marcantonio P., Dreizler S., Ehrenreich D., Hatzes A.P., Hara N.C., Henning T., Kaminski A., López-González M.J., Martins C.J.A.P., Micela G., Montes D., Pallé E., Pedraz S., Rodríguez E., Rodríguez-López C., Tal-Or L., Sousa S., Udry S. “Two temperate Earth-mass planets orbiting the nearby star GJ 1002” Astronomy and Astrophysics, 670, art. no. A5

Massalkhi S., Jiménez-Serra I., Martín-Pintado J., Rivilla V.M., Colzi L., Zeng S., Martín S., Tercero B., De Vicente P., Requena-Torres M.A. “The first detection of SiC2 in the interstellar medium” Astronomy and Astrophysics, 678, art. no. A45

Mateos G., Martínez-Bonilla A., Martínez J.M., Amils R. “Vitamin B12 Auxotrophy in Isolates from the Deep Subsurface of the Iberian Pyrite Belt” Genes, 14 (7), art. no. 1339

Matzeu G.A., Brusa M., Lanzuisi G., Dadina M., Bianchi S., Kriss G., Mehdipour M., Nardini E., Chartas G., Middei R., Piconcelli E., Gianolli V., Comastri A., Longinotti A.L., Krongold Y., Ricci F., Petrucci P.O., Tombesi F., Luminari A., Zappacosta L., Miniutti G., Gaspari M., Behar E., Bischetti M., Mathur S., Perna M., Giustini M., Grandi P., Torresi E., Vignali C., Bruni G., Cappi M., Costantini E., Cresci G., De Marco B., De Rosa A., Gilli R., Guainazzi M., Kaastra J., Kraemer S., La Franca F., Marconi A., Panessa F., Ponti G., Proga D., Ursini F., Baldini P., Fiore F., King A.R., Maiolino R., Matt G., Merloni A. “Supermassive Black Hole Winds in X-rays: SUBWAYS: I. Ultra-fast outflows in quasars beyond the local Universe” Astronomy and Astrophysics, 670, art. no. A182

McClure M.K., Rocha W.R.M., Pontoppidan K.M., Crouzet N., Chu L.E.U., Dartois E., Lamberts T., Noble J.A., Pendleton Y.J., Perotti G., Qasim D., Rachid M.G., Smith Z.L., Sun F., Beck T.L., Boogert A.C.A., Brown W.A., Caselli P., Charnley S.B., Cuppen H.M., Dickinson H., Drozdovskaya M.N., Egami E., Erkal J., Fraser H., Garrod R.T., Harsono D., Ioppolo S., Jiménez-Serra I., Jin M., Jørgensen J.K., Kristensen L.E., Lis D.C., McCoustra M.R.S., McGuire B.A., Melnick G.J., Öberg

K.I., Palumbo M.E., Shimonishi T., Sturm J.A., van Dishoeck E.F., Linnartz H. "An Ice Age JWST inventory of dense molecular cloud ices" Nature Astronomy, 7 (4), pp. 431 – 443

Megías A., Jimenez-Serra I., Martín-Pintado J., Vasyunin A.I., Spezzano S., Caselli P., Cosentino G., Viti S. "The complex organic molecular content in the L1517B starless core" Monthly Notices of the Royal Astronomical Society, 519 (2), pp. 1601 – 1617

Mehdipour M., Kriss G.A., Brusa M., Matzeu G.A., Gaspari M., Kraemer S.B., Mathur S., Behar E., Bianchi S., Cappi M., Chartas G., Costantini E., Cresci G., Dadina M., De Marco B., De Rosa A., Dunn J.P., Gianolli V.E., Giustini M., Kaastra J.S., King A.R., Krongold Y., La Franca F., Lanzuisi G., Longinotti A.L., Luminari A., Middei R., Miniutti G., Nardini E., Perna M., Petrucci P.-O., Piconcelli E., Ponti G., Ricci F., Tombesi F., Ursini F., Vignali C., Zappacosta L. "Supermassive Black Hole Winds in X-rays: SUBWAYS: II. HST UV spectroscopy of winds at intermediate redshifts" Astronomy and Astrophysics, 670, art. no. A183

Meier Valdés E.A., Morris B.M., Demory B.-O., Brandeker A., Kitzmann D., Benz W., Deline A., Florén H.-G., Sousa S.G., Bourrier V., Singh V., Heng K., Strugarek A., Bower D.J., Jäggi N., Carone L., Lendl M., Jones K., Oza A.V., Demangeon O.D.S., Alibert Y., Alonso R., Anglada G., Asquier J., Bárczy T., Barrado Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Billot N., Bonfils X., Borsato L., Broeg C., Cabrera J., Charnoz S., Collier Cameron A., Csizmadia S., Cubillos P.E., Davies M.B., Deleuil M., Delrez L., Ehrenreich D., Erikson A., Fortier A., Fossati L., Fridlund M., Gandolfi D., Gillon M., Güdel M., Günther M.N., Hoyer S., Isaak K.G., Kiss L.L., Laskar J., Lecavelier Des Etangs A., Lovis C., Magrin D., Maxted P.F.L., Mordasini C., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Sarajlic M., Scandariato G., Ségransan D., Sicilia D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Venturini J., Walton N.A., Wilson T.G., Wolter D. "Investigating the visible phase-curve variability of 55 Cnc e" Astronomy and Astrophysics, 677, art. no. A112

Melinder J., Östlin G., Hayes M., Rasekh A., Mas-Hesse J.M., Cannon J.M., Kunth D., Laursen P., Runnholm A., Herenz E.C., Messa M., Schaerer D., Verhamme A., Rivera-Thorsen T.E., Guaita L., Marquart T., Puschnig J., Le Reste A., Sandberg A., Freeland E., Bridge J. "The Lyα Reference Sample. XIV. Lyα Imaging of 45 Low-redshift Star-forming Galaxies and Inferences on Global Emission" Astrophysical Journal, Supplement Series, 266 (1), art. no. 15

Méndez-Abreu J., Costantin L., Kruk S. "The JWST view of the barred galaxy population in the SMACS0723 galaxy cluster" Astronomy and Astrophysics, 678, art. no. A54

Mercimek S., Podio L., Codella C., Chahine L., López-Sepulcre A., Ohashi S., Loinard L., Johnstone D., Menard F., Cuello N., Caselli P., Zamponi J., Aikawa Y., Bianchi E., Busquet G., Pineda J.E., Bouvier M., De Simone M., Zhang Y., Sakai N., Chandler C.J., Ceccarelli C., Alves F., Durán A., Fedele D., Murillo N., Jiménez-Serra I., Yamamoto S. “FAUST – VIII. The protostellar disc of VLA 1623–2417W and its streamers imaged by ALMA” Monthly Notices of the Royal Astronomical Society, 522 (2), pp. 2384 – 2392

Mérida R.M., Pérez-González P.G., Sánchez-Blázquez P., García-Argumánez Á., Annunziatella M., Costantin L., Lumbreras-Calle A., Alcalde-Pampliega B., Barro G., Espino-Briones N., Koekemoer A.M. “Probing the Star Formation Main Sequence Down to 108M o˙at 1.0 < z < 3.0” Astrophysical Journal, 950 (2), art. no. 125

Miles-Páez P.A., Metchev S.A., George B. “The photometric periods of rapidly rotating field ultra-cool dwarfs” Monthly Notices of the Royal Astronomical Society, 521 (1), pp. 952 – 968

Mininni C., Beltrán M.T., Colzi L., Rivilla V.M., Fontani F., Lorenzani A., López-Gallifa Á., Viti S., Sánchez-Monge Á., Schilke P., Testi L. “The GUAPOS project: III. Characterization of the O- and N-bearing complex organic molecules content and search for chemical differentiation” Astronomy and Astrophysics, 677, art. no. A15

Miniutti G., Giustini M., Arcodia R., Saxton R.D., Chakraborty J., Read A.M., Kara E. “Alive and kicking: A new QPE phase in GSN 069 revealing a quiescent luminosity threshold for QPEs” Astronomy and Astrophysics, 674, art. no. L1

Miniutti G., Giustini M., Arcodia R., Saxton R.D., Read A.M., Bianchi S., Alexander K.D. “Repeating tidal disruptions in GSN 069: Long-term evolution and constraints on quasi-periodic eruptions, models” Astronomy and Astrophysics, 670, art. no. A93

Molaro P., Aguado D.S., Caffau E., Allende Prieto C., Bonifacio P., González Hernández J.I., Rebolo R., Zapatero Osorio M.R., Cristiani S., Pepe F., Santos N.C., Alibert Y., Cupani G., Di Marcantonio P., D'Odorico V., Lovis C., Martins C.J.A.P., Milaković D., Murphy M.T., Nunes N.J., Schmidt T.M., Sousa S., Sozzetti A., Suárez Mascareño A. “The 12C/13C isotopic ratio at the dawn of chemical evolution” Astronomy and Astrophysics, 679, art. no. A72

Molpeceres G., Rivilla V.M., Furuya K., Kästner J., Maté B., Aikawa Y. “Processing of hydroxylamine, NH2OH, an important prebiotic precursor, on interstellar ices” Monthly Notices of the Royal Astronomical Society, 521 (4), pp. 6061 – 6074

Montegriffo P., Bellazzini M., De Angeli F., Andrae R., Barstow M.A., Bossini D., Bragaglia A., Burgess P.W., Cacciari C., Carrasco J.M., Chornay N., Delchambre L., Evans D.W., Fouesneau M., Frémat Y., Garabato D., Jordi C., Manteiga M., Massari D., Palaversa L., Pancino E., Riello M., Ruz Mieres D., Sanna N., Santoveña R., Sordo R., Vallenari A., Walton N.A., Brown A.G.A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Eyer L., Guerra R., Hutton A., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., Van Leeuwen F., Bakker J., Castañeda J., Fabricius C., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Nuñez Campos M., Dell Oro A., Esquej P., Fernández-Hernández J., Fraile E., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., JanãEn K., Jevardat De Fombelle G., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pauwels T., Recio-Blanco A., Reylé C., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anderson R.I., Anglada Varela E., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bouquillon S., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., De Laverny P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Håadczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-Antoine Piccolo A., Jiménez-Arranz Ã., Juaristi Campillo J., Julbe F., Karbevska L., Kervella P., Khanna S., Kordopatis G., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszynska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstróm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Madrero Pardo P., Magdaleno Romeo A., Managau S., Mann R.G., Marchant J.M., Marconi M., Marcos J., Marcos Santos M.M.S., Marín Pina D., Marinoni S., Marocco F., Marshall D.J., Martin Polo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Peñalosa Esteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Rios Diaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-

Gómez M., Rowell N., Royer F., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Salguero E., Samaras N., Sanchez Gimenez V., Sarasso M., Schultheis M.S., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Torralba Elipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., Van Dillen E., Van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Wevers T., Wyrzykowski L., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: The Galaxy in your preferred colours: Synthetic photometry from Gaia low-resolution spectra” Astronomy and Astrophysics, 674, art. no. A33

Moore R.A., Azua-Bustos A., González-Silva C., Carr C.E. “Unveiling metabolic pathways involved in the extreme desiccation tolerance of an Atacama cyanobacterium” Scientific Reports, 13 (1), art. no. 15767

Moral A.G., Mora J., Prieto-Ballesteros O., Ercilla O., Lopez-Reyes G., Canora C.P., Bonales L.J., Fernandez-Sampedro M., Sanz-Arranz J.A., Herrera A., Alonso R., Rull F., Böttger U., Cho Y., Schröder S., Hübers H.-W. “Deuterated PET: The new verification target of the Raman spectrometer for the MMX mission to explore Phobos” Journal of Raman Spectroscopy, 54 (11), pp. 1268 – 1279

Moreno-Paz M., dos Santos Severino R.S., Sánchez-García L., Manchado J.M., García-Villadangos M., Aguirre J., Fernández-Martínez M.A., Carrizo D., Kobayashi L., Dave A., Warren-Rhodes K., Davila A., Stoker C.R., Glass B., Parro V. “Life Detection and Microbial Biomarker Profiling with Signs of Life Detector-Life Detector Chip During a Mars Drilling Simulation Campaign in the Hyperarid Core of the Atacama Desert” Astrobiology, 23 (12), pp. 1259 – 1283

Morisset C., Corradi R.L.M., García-Rojas J., Mampaso A., Jones D., Kwitter K.B., Magrini L., Villaver E. “The computation of interstellar extinction in photoionized nebulae” Astronomy and Astrophysics, 674, art. no. L6

Morrison J.E., Dicken D., Argyriou I., Ressler M.E., Gordon K.D., Regan M.W., Cracraft M., Rieke G.H., Engesser M., Alberts S., Alvarez-Marquez J., Colbert J.W., Fox O.D., Gasman D., Law D.R., Garcia Marin M., Gáspár A., Guillard P., Kendrew S., Labiano A., Laine S., Noriega-Crespo A., Shivaei I., Sloan G.C. “JWST MIRI Flight Performance: Detector Effects and Data Reduction Algorithms” Publications of the Astronomical Society of the Pacific, 135 (1049), art. no. 075004

Mousis O., Bouquet A., Langevin Y., André N., Boithias H., Durry G., Faye F., Hartogh P., Helbert J., Iess L., Kempf S., Masters A., Postberg F., Renard J.-B., Vernazza P., Vorburger A., Wurz P., Atkinson D.H., Barabash S., Berthomier M., Brucato J., Cable M., Carter J., Cazaux S., Danger G., Dehant V., Fornaro T., Garnier P., Gautier T., Coustenis A., Groussin O., Hadid L.Z., Ize J.-C., Kolmasova I., Lebreton J.-P., Le Maistre S., Lellouch E., Lunine J.I., Mandt K.E., Martins Z., Mimoun D., Nenon Q., Muñoz Caro G.M., Rannou P., Rauer H., Schmitt-Kopplin P., Schneeberger A., Simons M., Stephan K., Van Hoolst T., Vaverka J., Wieser M., Wörner L. "Moonraker: Enceladus Multiple Flyby Mission" Planetary Science Journal, 3 (12), art. no. 268

Müller H.S.P., Garrod R.T., Belloche A., Rivilla V.M., Menten K.M., Jiménez-Serra I., Martín-Pintado J., Lewen F., Schlemmer S. "Rotation-tunnelling spectrum and astrochemical modelling of dimethylamine, CH3NHCH3, and searches for it in space" Monthly Notices of the Royal Astronomical Society, 523 (2), pp. 2887 – 2917

Munguira A., Hueso R., Sánchez-Lavega A., de la Torre-Juarez M., Martínez G.M., Newman C.E., Sebastian E., Lepinette A., Vicente-Retortillo A., Chide B., Lemmon M.T., Bertrand T., Lorenz R.D., Banfield D., Gómez-Elvira J., Martín-Soler J., Navarro S., Pla-García J., Rodríguez-Manfredi J.A., Romeral J., Smith M.D., Torres J. "Near Surface Atmospheric Temperatures at Jezero From Mars 2020 MEDA Measurements" Journal of Geophysical Research: Planets, 128 (3), art. no. e2022JE007559

Muñoz-Echeverría M., Macías-Pérez J.F., Pratt G.W., Adam R., Ade P., Ajeddig H., André P., Arnaud M., Artis E., Aussel H., Bartalucci I., Beelen A., Benoît A., Berta S., Bing L., Bourrion O., Calvo M., Catalano A., De Petris M., Désert F.-X., Doyle S., Driessen E.F.C., Ferragamo A., Gomez A., Goupy J., Hanser C., Kéruzoré F., Kramer C., Ladjelate B., Lagache G., Leclercq S., Lestrade J.-F., Maury A., Mauskopf P., Mayet F., Melin J.-B., Monfardini A., Paliwal A., Perotto L., Pisano G., Pointecouteau E., Ponthieu N., Revéret V., Rigby A.J., Ritacco A., Romero C., Roussel H., Ruppin F., Schuster K., Shu S., Sievers A., Tucker C., Yepes G. "Multi-probe analysis of the galaxy cluster CL J1226.9+3332: Hydrostatic mass and hydrostatic-To-lensing bias" Astronomy and Astrophysics, 671, art. no. A28

Muñoz-Hisado V., Ruiz-Blas F., Sobrado J.M., Garcia-Lopez E., Martinez-Alonso E., Alcázar A., Cid C. "Bacterial molecular machinery in the Martian cryosphere conditions" Frontiers in Microbiology, 14, art. no. 1176582

Murdoch N., Stott A.E., Mimoun D., Pinot B., Chatain A., Spiga A., Temel O., Garcia J.P., Onodera K., Lorenz R., Gillier M., Newman C., Garcia R.F., Lange L., Banfield D. "Investigating Diurnal and Seasonal Turbulence Variations of the Martian Atmosphere Using a Spectral Approach" Planetary Science Journal, 4 (11), art. no. 222

Murgas F., Castro-González A., Pallé E., Pozuelos F.J., Millholland S., Foo O., Korth J., Marfil E., Amado P.J., Caballero J.A., Christiansen J.L., Ciardi D.R., Collins K.A., Di Sora M., Fukui A., Gan T., Gonzales E.J., Henning T., Herrero E., Isopi G., Jenkins J.M., Lillo-Box J., Lodieu N., Luque R., Mallia F., Morales J.C., Morello G., Narita N., Orell-Miquel J., Parviainen H., Pérez-Torres M., Quirrenbach A., Reiners A., Ribas I., Safonov B.S., Seager S., Schwarz R.P., Schweitzer A., Schlecker M., Strakhov I.A., Vanaverbeke S., Watanabe N., Winn J.N., Zechmeister M. "Two super-Earths at the edge of the habitable zone of the nearby M dwarf TOI-2095" Astronomy and Astrophysics, 677, art. no. A182

Nadolny J., Michałowski M.J., Rizzo J.R., Karska A., Rasmussen J., Sollerman J., Hjorth J., Rossi A., Solar M., Wróblewski R., Leśniewska A. "Main Sequence to Starburst Transitioning Galaxies: Gamma-Ray Burst Hosts at z ∼ 2" Astrophysical Journal, 952 (2), art. no. 125

Nagel E., Czesla S., Kaminski A., Zechmeister M., Tal-Or L., Schmitt J.H.M.M., Reiners A., Quirrenbach A., García López A., Caballero J.A., Ribas I., Amado P.J., Béjar V.J.S., Cortés-Contreras M., Dreizler S., Hatzes A.P., Henning T., Jeffers S.V., Kürster M., Lafarga M., López-Puertas M., Montes D., Morales J.C., Pedraz S., Schweitzer A. "The CARMENES search for exoplanets around M dwarfs Telluric absorption corrected high S/N optical and near-infrared template spectra of 382 M dwarf stars" Astronomy and Astrophysics, 680, art. no. A73

Nascimbeni V., Borsato L., Zingales T., Piotto G., Pagano I., Beck M., Broeg C., Ehrenreich D., Hoyer S., Majidi F.Z., Granata V., Sousa S.G., Wilson T.G., Van Grootel V., Bonfanti A., Salmon S., Mustill A.J., Delrez L., Alibert Y., Alonso R., Anglada G., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck T., Benz W., Bergomi M., Billot N., Bonfils X., Brandeker A., Cabrera J., Charnoz S., Collier Cameron A., Csizmadia Sz., Cubillos P.E., Davies M.B., Deleuil M., Deline A., Demangeon O.D.S., Demory B.-O., Erikson A., Fortier A., Fossati L., Fridlund M., Gandolfi D., Gillon M., Güdel M., Isaak K.G., Kiss L.L., Laskar J., des Etangs A.L., Lendl M., Lovis C., Luque R., Magrin D., Maxted P.F.L., Mordasini C., Olofsson G., Ottensamer R., Pallé E., Peter G., Piazza D., Pollacco D., Queloz D., Ragazzoni R., Rando N., Ratti F., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steinberger M., Steller M., Szabó Gy.M., Thomas N., Udry S., Venturini J., Walton N.A., Wolter D. "A new dynamical modeling of the WASP-47 system with CHEOPS observations" Astronomy and Astrophysics, 673, art. no. A42

Nazarious M.I., Zorzano M.-P., Martin-Torres J. "Sub-Liquid and Atmospheric Measurement Instrument To Autonomously Monitor the Biochemistry of Natural Aquatic Ecosystems" ACS ES and T Water, 3 (8), pp. 2338 – 2354

Nepal S., Guiglion G., De Jong R.S., Valentini M., Chiappini C., Steinmetz M., Ambrosch M., Pancino E., Jeffries R.D., Bensby T., Romano D., Smiljanic R., Dantas M.L.L., Gilmore G., Randich S., Bayo A., Bergemann M., Franciosini E., Jiménez-Esteban F., Jofré P., Morbidelli L., Sacco G.G., Tautvaišiene G., Zaggia S. "The Gaia-ESO Survey: Preparing the ground for 4MOST and

WEAVE galactic surveys: Chemical evolution of lithium with machine learning" Astronomy and Astrophysics, 671, art. no. A61

Nogueras-Lara F., Schultheis M., Najarro F., Sormani M.C., Gadotti D.A., Rich R.M. "Evidence of an age gradient along the line of sight in the nuclear stellar disc of the Milky Way" Astronomy and Astrophysics, 671, art. no. L10

Okoda Y., Oya Y., Francis L., Johnstone D., Ceccarelli C., Codella C., Chandler C.J., Sakai N., Aikawa Y., Alves F.O., Herbst E., Maureira M.J., Bouvier M., Caselli P., Choudhury S., De Simone M., Jímenez-Serra I., Pineda J., Yamamoto S. "FAUST. VII. Detection of a Hot Corino in the Prototypical Warm Carbon-chain Chemistry Source IRAS 15398-3359" Astrophysical Journal, 948 (2), art. no. 127

Olsson-Francis K., Doran P.T., Ilyin V., Raulin F., Rettberg P., Kminek G., Mier M.-P.Z., Coustenis A., Hedman N., Shehhi O.A., Ammannito E., Bernardini J., Fujimoto M., Grasset O., Groen F., Hayes A., Gallagher S., Kumar K P., Mustin C., Nakamura A., Seasly E., Suzuki Y., Peng J., Prieto-Ballesteros O., Sinibaldi S., Xu K., Zaitsev M. "The COSPAR Planetary Protection Policy for robotic missions to Mars: A review of current scientific knowledge and future perspectives" Life Sciences in Space Research, 36, pp. 27 – 35

Orell-Miquel J., Lampón M., López-Puertas M., Mallorquín M., Murgas F., Peláez-Torres A., Pallé E., Esparza-Borges E., Sanz-Forcada J., Tabernero H.M., Nortmann L., Nagel E., Parviainen H., Zapatero Osorio M.R., Caballero J.A., Czesla S., Cifuentes C., Morello G., Quirrenbach A., Amado P.J., Fernández-Martín A., Fukui A., Henning T., Kawauchi K., De Leon J.P., Molaverdikhani K., Montes D., Narita N., Reiners A., Ribas I., Sánchez-López A., Schweitzer A., Stangret M., Yan F. "Confirmation of an He I evaporating atmosphere around the 650-Myr-old sub-Neptune HD 235088 b (TOI-1430 b) with CARMENES" Astronomy and Astrophysics, 677, art. no. A56

Ormö J., Sturkell E., Lambert P., Bourquin S., Cherfils J.-B. "Oceanic resurge deposits at the Rochechouart impact structure (France) suggest a marine target environment" Geological Magazine, 160 (4), pp. 794 – 802

Osborn A., Armstrong D.J., Fernández Fernández J., Knierim H., Adibekyan V., Collins K.A., Delgado-Mena E., Fridlund M., Gomes Da Silva J., Hellier C., Jackson D.G., King G.W., Lillo-Box J., Matson R.A., Matthews E.C., Santos N.C., Sousa S.G., Stassun K.G., Tan T.-G., Ricker G.R., Vanderspek R., Latham D.W., Seager S., Winn J.N., Jenkins J.M., Bayliss D., Bouma L.G., Ciardi D.R., Collins K.I., Colón K.D., Crossfield I.J.M., Demangeon O.D.S., Díaz R.F., Dorn C., Dumusque X., Keniger M.A.F., Figueira P., Gan T., Goeke R.F., Hadjigeorghiou A., Hawthorn F., Helled R., Howell S.B., Nielsen L.D., Osborn H.P., Quinn S.N., Sefako R., Shporer A., Strøm P.A., Twicken

J.D., Vanderburg A., Wheatley P.J. "TOI-332 b: a super dense Neptune found deep within the Neptunian desert" Monthly Notices of the Royal Astronomical Society, 526 (1), pp. 548 – 566

Osborn H.P., Nowak G., Hébrard G., Masseron T., Lillo-Box J., Pallé E., Bekkelien A., Florén H.-G., Guterman P., Simon A.E., Adibekyan V., Bieryla A., Borsato L., Brandeker A., Ciardi D.R., Cameron A.C., Collins K.A., Egger J.A., Gandolfi D., Hooton M.J., Latham D.W., Lendl M., Matthews E.C., Tuson A., Ulmer-Moll S., Vanderburg A., Wilson T.G., Ziegler C., Alibert Y., Alonso R., Anglada G., Arnold L., Asquier J., y Navascues D.B., Baumjohann W., Beck T., Belinski A.A., Benz W., Biondi F., Boisse I., Bonfils X., Broeg C., Buchhave L.A., Bárczy T., Barros S.C.C., Cabrera J., Guillen C.C., Carleo I., Castro-González A., Charnoz S., Christiansen J., Cortes-Zuleta P., Csizmadia S., Dalal S., Davies M.B., Deleuil M., Delfosse X., Delrez L., Demory B.-O., Dunlavey A.B., Ehrenreich D., Erikson A., Fernandes R.B., Fortier A., Forveille T., Fossati L., Fridlund M., Gillon M., Goeke R.F., Goliguzova M.V., Gonzales E.J., Günther M.N., Güdel M., Heidari N., Henze C.E., Howell S., Hoyer S., Frey J.I., Isaak K.G., Jenkins J.M., Kiefer F., Kiss L., Korth J., Maxted P.F.L., Laskar J., des Etangs A.L., Lovis C., Lund M.B., Luque R., Magrin D., Almenara J.M., Martioli E., Mecina M., Medina J.V., Moldovan D., Morales-Calderón M., Morello G., Moutou C., Murgas F., Jensen E.L.N., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Ricker G., Demangeon O.D.S., Smith A.M.S., Santos N., Scandariato G., Seager S., Sousa S.G., Steller M., Szabó G.M., Ségransan D., Thomas N., Udry S., Ulmer B., Van Grootel V., Vanderspek R., Walton N., Winn J.N. "Two warm Neptunes transiting HIP 9618 revealed by TESS and Cheops" Monthly Notices of the Royal Astronomical Society, 523 (2), pp. 3069 – 3089

Palacio I., Moreno M., Náñez A., Purwidyantri A., Domingues T., Cabral P.D., Borme J., Marciello M., Mendieta-Moreno J.I., Torres-Vázquez B., Martínez J.I., López M.F., García-Hernández M., Vázquez L., Jelínek P., Alpuim P., Briones C., Martín-Gago J.Á. "Attomolar detection of hepatitis C virus core protein powered by molecular antenna-like effect in a graphene field-effect aptasensors" Biosensors and Bioelectronics, 222, art. no. 115006

Palle E., Orell-Miquel J., Brady M., Bean J., Hatzes A.P., Morello G., Morales J.C., Murgas F., Molaverdikhani K., Parviainen H., Sanz-Forcada J., Béjar V.J.S., Caballero J.A., Sreenivas K.R., Schlecker M., Ribas I., Perdelwitz V., Tal-Or L., Pérez-Torres M., Luque R., Dreizler S., Fuhrmeister B., Aceituno F., Amado P.J., Anglada-Escudé G., Caldwell D.A., Charbonneau D., Cifuentes C., De Leon J.P., Collins K.A., Dufoer S., Espinoza N., Essack Z., Fukui A., Chew Y.G.M., Gómez-Muñoz M.A., Henning T., Herrero E., Jeffers S.V., Jenkins J., Kaminski A., Kasper J., Kunimoto M., Latham D., Lillo-Box J., López-González M.J., Montes D., Mori M., Narita N., Quirrenbach A., Pedraz S., Reiners A., Rodríguez E., Rodríguez-López C., Sabin L., Schanche N., Schwarz R.-P., Schweitzer A., Seifahrt A., Stefansson G., Sturmer J., Trifonov T., Vanaverbeke S., Wells R.D., Zapatero-Osorio M.R., Zechmeister M. "GJ 806 (TOI-4481): A bright nearby multi-planetary system with a transiting hot low-density super-Earth" Astronomy and Astrophysics, 678, art. no. A80

Papovich C., Cole J.W., Yang G., Finkelstein S.L., Barro G., Buat V., Burgarella D., Pérez-González P.G., Santini P., Seillé L.-M., Shen L., Haro P.A., Bagley M.B., Bell E.F., Bisigello L., Calabrò A., Casey C.M., Castellano M., Chworowsky K., Cleri N.J., Costantin L., Cooper M.C., Dickinson M., Ferguson H.C., Fontana A., Giavalisco M., Grazian A., Grogin N.A., Hathi N.P., Holwerda B.W., Hutchison T.A., Kartaltepe J.S., Kewley L.J., Kirkpatrick A., Kocevski D.D., Koekemoer A.M., Larson R.L., Long A.S., Lucas R.A., Pentericci L., Pirzkal N., Ravindranath S., Somerville R.S., Trump J.R., Urbano Stawinski S.M., Weiner B.J., Wilkins S.M., Aaron Yung L.Y., Zavala J.A. "CEERS Key Paper. V. Galaxies at 4 < z < 9 Are Bluer than They Appear-Characterizing Galaxy Stellar Populations from Rest-frame ∼1 μm Imaging" Astrophysical Journal Letters, 949 (2), art. no. L18

Patel J.A., Egger J.A., Wilson T.G., Bourrier V., Carone L., Beck M., Ehrenreich D., Sousa S.G., Benz W., Brandeker A., Deline A., Alibert Y., Lam K.W.F., Lendl M., Alonso R., Anglada G., Bárczy T., Barrado D., Barros S.C.C., Baumjohann W., Beck T., Billot N., Bonfils X., Broeg C., Busch M.-D., Cabrera J., Charnoz S., Collier Cameron A., Csizmadia S., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Erikson A., Fortier A., Fossati L., Fridlund M., Gandolfi D., Gillon M., Güdel M., Heng K., Hoyer S., Isaak K.G., Kiss L.L., Kopp E., Laskar J., Lecavelier Des Etangs A., Lovis C., Magrin D., Maxted P.F.L., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Ratti F., Rauer H., Ribas I., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Ulmer B., Van Grootel V., Viotto V., Walton N.A. "CHEOPS and TESS view of the ultra-short-period super-Earth TOI-561 b" Astronomy and Astrophysics, 679, art. no. A92

Peralta De Arriba L., Alonso-Herrero A., García-Burillo S., García-Bernete I., Villar-Martín M., García-Lorenzo B., Davies R., Rosario D.J., Hönig S.F., Levenson N.A., Packham C., Ramos Almeida C., Pereira-Santaella M., Audibert A., Bellocchi E., Hicks E.K.S., Labiano A., Ricci C., Rigopoulou D. "A radio-jet-driven outflow in the Seyfert 2 galaxy NGC 2110?" Astronomy and Astrophysics, 675, art. no. A58

Pérez-Fernández C., González-Toril E., Mateo-Martí E., Ruiz-Bermejo M. "Multivariate Analysis Applied to Microwave-Driven Cyanide Polymerization: A Statistical View of a Complex System" Polymers, 15 (2), art. no. 410

Pérez-Fernández C., Vega J., de la Fuente J.L., Mateo-Martí E., Valles P., Ruiz-Bermejo M. "Ammonium affects the wet chemical network of HCN: feedback between prebiotic chemistry and materials science" Physical Chemistry Chemical Physics, 25 (30), pp. 20473 – 20484

Pérez-González P.G., Barro G., Annunziatella M., Costantin L., García-Argumánez I., McGrath E.J., Mérida R.M., Zavala J.A., Haro P.A., Bagley M.B., Backhaus B.E., Behroozi P., Bell E.F., Bisigello L., Buat V., Calabrò A., Casey C.M., Cleri N.J., Coogan R.T., Cooper M.C., Cooray A.R., Dekel A., Dickinson M., Elbaz D., Ferguson H.C., Finkelstein S.L., Fontana A., Franco M., Gardner

J.P., Giavalisco M., Gómez-Guijarro C., Grazian A., Grogin N.A., Guo Y., Huertas-Company M., Jogee S., Kartaltepe J.S., Kewley L.J., Kirkpatrick A., Kocevski D.D., Koekemoer A.M., Long A.S., Lotz J.M., Lucas R.A., Papovich C., Pirzkal N., Ravindranath S., Somerville R.S., Tacchella S., Trump J.R., Wang W., Wilkins S.M., Wuyts S., Yang G., Aaron Yung L.Y. "CEERS Key Paper. IV. A Triality in the Nature of HST-dark Galaxies" Astrophysical Journal Letters, 946 (1), art. no. L16

Pérez-González P.G., Costantin L., Langeroodi D., Rinaldi P., Annunziatella M., Ilbert O., Colina L., Nørgaard-Nielsen H.U., Greve T.R., Östlin G., Wright G., Alonso-Herrero A., Álvarez-Márquez J., Caputi K.I., Eckart A., Le Fèvre O., Labiano I., García-Marín M., Hjorth J., Kendrew S., Pye J.P., Tikkanen T., van der Werf P., Walter F., Ward M., Bik A., Boogaard L., Bosman S.E.I., Gómez A.C., Gillman S., Iani E., Jermann I., Melinder J., Meyer R.A., Moutard T., van Dishoek E., Henning T., Lagage P.-O., Guedel M., Peissker F., Ray T., Vandenbussche B., García-Argumánez I., María Mérida R. "Life beyond 30: Probing the −20 < M UV < −17 Luminosity Function at 8 < z < 13 with the NIRCam Parallel Field of the MIRI Deep Survey" Astrophysical Journal Letters, 951 (1), art. no. L1

Perger M., Anglada-Escudé G., Baroch D., Lafarga M., Ribas I., Morales J.C., Herrero E., Amado P.J., Barnes J.R., Caballero J.A., Jeffers S.V., Quirrenbach A., Reiners A. "A machine learning approach for correcting radial velocities using physical observables" Astronomy and Astrophysics, 672, art. no. A118

Perotti G., Christiaens V., Henning T., Tabone B., Waters L.B.F.M., Kamp I., Olofsson G., Grant S.L., Gasman D., Bouwman J., Samland M., Franceschi R., van Dishoeck E.F., Schwarz K., Güdel M., Lagage P.-O., Ray T.P., Vandenbussche B., Abergel A., Absil O., Arabhavi A.M., Argyriou I., Barrado D., Boccaletti A., Caratti o Garatti A., Geers V., Glauser A.M., Justannont K., Lahuis F., Mueller M., Nehmé C., Pantin E., Scheithauer S., Waelkens C., Guadarrama R., Jang H., Kanwar J., Morales-Calderón M., Pawellek N., Rodgers-Lee D., Schreiber J., Colina L., Greve T.R., Östlin G., Wright G. "Water in the terrestrial planet-forming zone of the PDS 70 disk" Nature, 620 (7974), pp. 516 – 520

Petkova M.A., Kruijssen J.M.D., Henshaw J.D., Longmore S.N., Glover S.C.O., Sormani M.C., Armillotta L., Barnes A.T., Klessen R.S., Nogueras-Lara F., Tress R.G., Armijos-Abendaño J., Colzi L., Federrath C., García P., Ginsburg A., Henkel C., Martín S., Riquelme D., Rivilla V.M. "Kinematics of Galactic Centre clouds shaped by shear-seeded solenoidal turbulence" Monthly Notices of the Royal Astronomical Society, 525 (1), pp. 962 – 968

Pla-García J., Munguira A., Rafkin S., Newman C., Bertrand T., Martínez G., Hueso R., Sánchez-Lavega A., del Río Gaztelurrutia T., Stott A., Murdoch N., de la Torre Juárez M., Lemmon M., Chide B., Viúdez-Moreiras D., Savijarvi H., Richardson M., Marín M., Sebastian E., Lepinette-Malvitte A., Mora L., Rodríguez-Manfredi J.A. "Nocturnal Turbulence at Jezero Crater as

Determined From MEDA Measurements and Modeling” Journal of Geophysical Research: Planets, 128 (8), art. no. e2022JE007607

Población I., Torre-Fdez I., Aramendia J., López-Reyes G., Cabalín L.M., Madariaga J.M., Rull F., Laserna J.J., Carrizo D., Martínez-Frías J., Belenguer T., Taravillo M., Dell'Aglio M., De Giacomo A., Huidobro J., Manrique J.A., Delgado T., Arana G., Castro K., Veneranda M., Sanz-Arranz J.A., Fortes F.J., García-Gómez L. “Raman spectroscopy, assisted by X-ray fluorescence and laser-induced breakdown spectroscopy, to characterise original and altered mineral phases in the NWA 2975 Martian shergottite” Journal of Raman Spectroscopy, 54 (11), pp. 1233 – 1247

Polkko J., Hieta M., Harri A.-M., Tamppari L., Martínez G., Viúdez-Moreiras D., Savijärvi H., Conrad P., Zorzano Mier M.P., De La Torre Juarez M., Hueso R., Munguira A., Leino J., Gómez F., Jaakonaho I., Fischer E., Genzer M., Apestigue V., Arruego I., Banfield D., Lepinette A., Paton M., Rodriguez-Manfredi J.A., Sánchez Lavega A., Sebastian E., Toledo D., Vicente-Retortillo A. “Initial Results of the Relative Humidity Observations by MEDA Instrument Onboard the Mars 2020 Perseverance Rover” Journal of Geophysical Research: Planets, 128 (2), art. no. e2022JE007447

Prasad S., Zhang Q., Moran J., Cao Y., Jimenéz-Serra I., Martín-Pintado J., Martínez-Henares A., Báez-Rubio A. “Detection of a High-velocity Jet from MWC 349A Traced by Hydrogen Recombination Line Maser Emission” Astrophysical Journal Letters, 953 (1), art. no. L6

Putkuri C., Gamen R., Morrell N.I., Maíz Apellániz J., Arias J.I., Simón-Díaz S., Ferrero G.A., Rodríguez C.N., Sota A., Benvenuto O.G., Barbá R.H. “The spectroscopic orbit of HD 168112 A,B in NGC 6604: Another massive binary target for interferometry” Monthly Notices of the Royal Astronomical Society, 525 (4), pp. 6084 – 6096

Puzzarini C., Alessandrini S., Bizzocchi L., Melosso M., Rivilla V.M. “From the laboratory to the interstellar medium: a strategy to search for exotic molecules in space” Frontiers in Astronomy and Space Sciences, 10, art. no. 1211784

Quintana-Lacaci G., Velilla-Prieto L., Agúndez M., Fonfría J.P., Cernicharo J., Decin L., Castro-Carrizo A. “History of two mass loss processes in VY CMa: Fast outflows carving older ejecta” Astronomy and Astrophysics, 669, art. no. A56

Quintin E., Webb N.A., Guillot S., Miniutti G., Kammoun E.S., Giustini M., Arcodia R., Soucail G., Clerc N., Amato R., Markwardt C.B. “Tormunda's return: Hints of quasi-periodic eruption features from a recent optical tidal disruption event” Astronomy and Astrophysics, 675, art. no. A152

Quispe-Huaynasi F., Roig F., Daflon S., Pereira C.B., Placco V.M., Jiménez-Esteban F., Galindo-Guil F.J., Alvarez-Candal A., Alcaniz J., Angulo R.E., Cenarro J., Cristóbal-Hornillos D., Dupke R., Ederoclite A., Hernández-Monteagudo C., López-Sanjuan C., Marín-Franch A., Moles M., Sodré L., Jr., Varela J., Ramió H.V. "J-PLUS: characterization of high-velocity stars in the second data release" Monthly Notices of the Royal Astronomical Society, 522 (3), pp. 3898 – 3911

Rangarajan V.G., Tornabene L.L., Osinski G.R., Conway S.J., Seelos F.P., Silvestro S., Salese F., Pajola M., Lucchetti A., Munaretto G., Bickel V.T., Thomas N., Cremonese G. "Change detection and monitoring of active Martian surface phenomena with the Colour and Stereo Surface Imaging System (CaSSIS) onboard the ExoMars Trace Gas Orbiter (TGO)" Icarus, 394, art. no. 115443

Ray T.P., McCaughrean M.J., Caratti o Garatti A., Kavanagh P.J., Justtanont K., van Dishoeck E.F., Reitsma M., Beuther H., Francis L., Gieser C., Klaassen P., Perotti G., Tychoniec L., van Gelder M., Colina L., Greve T.R., Güdel M., Henning T., Lagage P.O., Östlin G., Vandenbussche B., Waelkens C., Wright G. "Outflows from the youngest stars are mostly molecular" Nature, 622 (7981), pp. 48 – 52

Recio-Blanco A., Kordopatis G., De Laverny P., Palicio P.A., Spagna A., Spina L., Katz D., Re Fiorentin P., Poggio E., McMillan P.J., Vallenari A., Lattanzi M.G., Seabroke G.M., Casamiquela L., Bragaglia A., Antoja T., Bailer-Jones C.A.L., Schultheis M., Andrae R., Fouesneau M., Cropper M., Cantat-Gaudin T., Bijaoui A., Heiter U., Brown A.G.A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bastian U., Drimmel R., Jansen F., Van Leeuwen F., Bakker J., Cacciari C., Castañeda J., De Angeli F., Fabricius C., Frémat Y., Galluccio L., Guerrier A., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Nuñez Campos M., Delchambre L., Dell Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., Janen K., Jevardat De Fombelle G., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Reylé C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Anglada Varela E., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., Di Matteo P., Diakite S., Diener C., Distefano E., Dolding C., Edvardsson B., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Håadczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-Antoine Piccolo A., Jiménez-Arranz Ã., Juaristi Campillo J., Julbe F., Karbevska L., Kervella P., Khanna S., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszy K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Madrero Pardo P., Magdaleno Romeo A., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Marcos Santos M.M.S., Marín Pina D., Marinoni S., Marocco F., Marshall D.J., Martin Polo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Peñalosa Esteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Regibo S., Richards P.J., Rios Diaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Salguero E., Samaras N., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Torralba Elipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., Van Dillen E., Van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. “Gaia Data Release 3: Chemical cartography of the Milky Way” Astronomy and Astrophysics, 674, art. no. A38

Ribas I., Reiners A., Zechmeister M., Caballero J.A., Morales J.C., Sabotta S., Baroch D., Amado P.J., Quirrenbach A., Abril M., Aceituno J., Anglada-Escudé G., Azzaro M., Barrado D., Béjar V.J.S., Benítez De Haro D., Bergond G., Bluhm P., Calvo Ortega R., Cardona Guillén C., Chaturvedi P., Cifuentes C., Colomé J., Cont D., Cortés-Contreras M., Czesla S., Díez-Alonso E., Dreizler S., Duque-Arribas C., Espinoza N., Fernández M., Fuhrmeister B., Galadí-Enríquez D., García-López A., González-Álvarez E., González Hernández J.I., Guenther E.W., De Guindos E., Hatzes A.P., Henning T., Herrero E., Hintz D., Huelmo A.L., Jeffers S.V., Johnson E.N., De Juan E., Kaminski A., Kemmer J., Khaimova J., Khalafinejad S., Kossakowski D., Kürster M., Labarga F., Lafarga M., Lalitha S., Lampón M., Lillo-Box J., Lodieu N., López González M.J., López-Puertas M., Luque R., Magán H., Mancini L., Marfil E., Martín E.L., Martín-Ruiz S., Molaverdikhani K., Montes D., Nagel E., Nortmann L., Nowak G., Pallé E., Passegger V.M., Pavlov A., Pedraz S., Perdelwitz V., Perger M., Ramón-Ballesta A., Reffert S., Revilla D., Rodríguez E., Rodríguez-López C., Sadegi S., Sánchez Carrasco M.A., Sánchez-López A., Sanz-Forcada J., Schäfer S., Schlecker M., Schmitt J.H.M.M., Schöfer P., Schweitzer A., Seifert W., Shan Y., Skrzypinski S.L., Solano E., Stahl O., Stangret M., Stock S., Stürmer J., Tabernero H.M., Tal-Or L., Trifonov T., Vanaverbeke S., Yan F., Zapatero Osorio M.R. "The CARMENES search for exoplanets around M dwarfs: Guaranteed time observations Data Release 1 (2016-2020)" Astronomy and Astrophysics, 670, art. no. A139

Rieke M.J., Robertson B., Tacchella S., Hainline K., Johnson B.D., Hausen R., Ji Z., Willmer C.N.A., Eisenstein D.J., Puskás D., Alberts S., Arribas S., Baker W.M., Baum S., Bhatawdekar R., Bonaventura N., Boyett K., Bunker A.J., Cameron A.J., Carniani S., Charlot S., Chevallard J., Chen Z., Curti M., Curtis-Lake E., Danhaive A.L., DeCoursey C., Dressler A., Egami E., Endsley R., Helton J.M., Hviding R.E., Kumari N., Looser T.J., Lyu J., Maiolino R., Maseda M.V., Nelson E.J., Rieke G., Rix H.-W., Sandles L., Saxena A., Sharpe K., Shivaei I., Skarbinski M., Smit R., Stark D.P., Stone M., Suess K.A., Sun F., Topping M., Übler H., Villanueva N.C., Wallace I.E.B., Williams C.C., Willott C., Whitler L., Witstok J., Woodrum C. "JADES Initial Data Release for the Hubble Ultra Deep Field: Revealing the Faint Infrared Sky with Deep JWST NIRCam Imaging" Astrophysical Journal, Supplement Series, 269 (1), art. no. 16

Rigby J., Perrin M., McElwain M., Kimble R., Friedman S., Lallo M., Doyon R., Feinberg L., Ferruit P., Glasse A., Rieke M., Rieke G., Wright G., Willott C., Colon K., Milam S., Neff S., Stark C., Valenti J., Abell J., Abney F., Abul-Huda Y., Scott Acton D., Adams E., Adler D., Aguilar J., Ahmed N., Albert L., Alberts S., Aldridge D., Allen M., Altenburg M., Álvarez-Márquez J., Alves de Oliveira C., Andersen G., Anderson H., Anderson S., Argyriou I., Armstrong A., Arribas S., Artigau E., Arvai A., Atkinson C., Bacon G., Bair T., Banks K., Barrientes J., Barringer B., Bartosik P., Bast W., Baudoz P., Beatty T., Bechtold K., Beck T., Bergeron E., Bergkoetter M., Bhatawdekar R., Birkmann S., Blazek R., Blome C., Boccaletti A., Böker T., Boia J., Bonaventura N., Bond N., Bosley K., Boucarut R., Bourque M., Bouwman J., Bower G., Bowers C., Boyer M., Bradley L., Brady G., Braun H., Breda D., Bresnahan P., Bright S., Britt C., Bromenschenkel A., Brooks B., Brooks K., Brown B., Brown M., Brown P., Bunker A., Burger M., Bushouse H., Cale S., Cameron A., Cameron P., Canipe A., Caplinger J., Caputo F., Cara M., Carey L., Carniani S., Carrasquilla M., Carruthers M., Case M., Catherine R., Chance D., Chapman G., Charlot S., Charlow B., Chayer P., Chen B., Cherinka B., Chichester S., Chilton Z., Chonis T., Clampin M., Clark C., Clark K., Coe D., Coleman B., Comber B., Comeau T., Connolly D., Cooper J., Cooper R., Coppock E., Correnti M., Cossou C., Coulais A., Coyle L., Cracraft M., Curti M., Cuturic S., Davis K., Davis M., Dean B., DeLisa A., deMeester W., Dencheva N., Dencheva N., DePasquale J., Deschenes J., Hunor Detre I., Diaz R., Dicken D., DiFelice A., Dillman M., Dixon W., Doggett J., Donaldson T., Douglas R., DuPrie K., Dupuis J., Durning J., Easmin N., Eck W., Edeani C., Egami E., Ehrenwinkler R., Eisenhamer J., Eisenhower M., Elie M., Elliott J., Elliott K., Ellis T., Engesser M., Espinoza N., Etienne O., Etxaluze M., Falini P., Feeney M., Ferry M., Filippazzo J., Fincham B., Fix M., Flagey N., Florian M., Flynn J., Fontanella E., Ford T., Forshay P., Fox O., Franz D., Fu H., Fullerton A., Galkin S., Galyer A., García Marín M., Gardner J.P., Gardner L., Garland D., Garrett B., Gasman D., Gaspar A., Gaudreau D., Gauthier P., Geers V., Geithner P., Gennaro M., Giardino G., Girard J., Giuliano M., Glassmire K., Glauser A., Glazer S., Godfrey J., Golimowski D., Gollnitz D., Gong F., Gonzaga S., Gordon M., Gordon K., Goudfrooij P., Greene T.,

Greenhouse M., Grimaldi S., Groebner A., Grundy T., Guillard P., Gutman I., Ha K.Q., Haderlein P., Hagedorn A., Hainline K., Haley C., Hami M., Hamilton F., Hammel H., Hansen C., Harkins T., Harr M., Hart J., Hart Q., Hartig G., Hashimoto R., Haskins S., Hathaway W., Havey K., Hayden B., Hecht K., Heller-Boyer C., Henriques C., Henry A., Hermann K., Hernandez S., Hesman B., Hicks B., Hilbert B., Hines D., Hoffman M., Holfeltz S., Holler B.J., Hoppa J., Hott K., Howard J.M., Howard R., Hunter A., Hunter D., Hurst B., Husemann B., Hustak L., Ilinca Ignat L., Illingworth G., Irish S., Jackson W., Jahromi A., Jakobsen P., James L., James B., Januszewski W., Jenkins A., Jirdeh H., Johnson P., Johnson T., Jones V., Jones R., Jones D., Jones O., Jordan I., Jordan M., Jurczyk S., Jurling A., Kaleida C., Kalmanson P., Kammerer J., Kang H., Kao S.-H., Karakla D., Kavanagh P., Kelly D., Kendrew S., Kennedy H., Kenny D., Keski-Kuha R., Keyes C., Kidwell R., Kinzel W., Kirk J., Kirkpatrick M., Kirshenblat D., Klaassen P., Knapp B., Scott Knight J., Knollenberg P., Koehler R., Koekemoer A., Kovacs A., Kulp T., Kumari N., Kyprianou M., La Massa S., Labador A., Labiano A., Lagage P.-O., Lajoie C.-P., Lam M., Lamb T., Lambros S., Lampenfield R., Langston J., Larson K., Law D., Lawrence J., Lee D., Leisenring J., Lepo K., Leveille M., Levenson N., Levine M., Levy Z., Lewis D., Lewis H., Libralato M., Lightsey P., Link M., Liu L., Lo A., Lockwood A., Logue R., Long C., Long D., Loomis C., Lopez-Caniego M., Lorenzo Alvarez J., Love-Pruitt J., Lucy A., Luetzgendorf N., Maghami P., Maiolino R., Major M., Malla S., Malumuth E., Manjavacas E., Mannfolk C., Marrione A., Marston A., Martel A., Maschmann M., Masci G., Masciarelli M., Maszkiewicz M., Mather J., McKenzie K., McLean B., McMaster M., Melbourne K., Meléndez M., Menzel M., Merz K., Meyett M., Meza L., Miskey C., Misselt K., Moller C., Morrison J., Morse E., Moseley H., Mosier G., Mountain M., Mueckay J., Mueller M., Mullally S., Murphy J., Murray K., Murray C., Mustelier D., Muzerolle J., Mycroft M., Myers R., Myrick K., Nanavati S., Nance E., Nayak O., Naylor B., Nelan E., Nickson B., Nielson A., Nieto-Santisteban M., Nikolov N., Noriega-Crespo A., O'Shaughnessy B., O'Sullivan B., Ochs W., Ogle P., Oleszczuk B., Olmsted J., Osborne S., Ottens R., Owens B., Pacifici C., Pagan A., Page J., Park S., Parrish K., Patapis P., Paul L., Pauly T., Pavlovsky C., Pedder A., Peek M., Pena-Guerrero M., Penanen K., Perez Y., Perna M., Perriello B., Phillips K., Pietraszkiewicz M., Pinaud J.-P., Pirzkal N., Pitman J., Piwowar A., Platais V., Player D., Plesha R., Pollizi J., Polster E., Pontoppidan K., Porterfield B., Proffitt C., Pueyo L., Pulliam C., Quirt B., Quispe Neira I., Ramos Alarcon R., Ramsay L., Rapp G., Rapp R., Rauscher B., Ravindranath S., Rawle T., Regan M., Reichard T.A., Reis C., Ressler M.E., Rest A., Reynolds P., Rhue T., Richon K., Rickman E., Ridgaway M., Ritchie C., Rix H.-W., Robberto M., Robinson G., Robinson M., Robinson O., Rock F., Rodriguez D., Rodriguez Del Pino B., Roellig T., Rohrbach S., Roman A., Romelfanger F., Rose P., Roteliuk A., Roth M., Rothwell B., Rowlands N., Roy A., Royer P., Royle P., Rui C., Rumler P., Runnels J., Russ M., Rustamkulov Z., Ryden G., Ryer H., Sabata M., Sabatke D., Sabbi E., Samuelson B., Sapp B., Sappington B., Sargent B., Sauer A., Scheithauer S., Schlawin E., Schlitz J., Schmitz T., Schneider A., Schreiber J., Schulze V., Schwab R., Scott J., Sembach K., Shanahan C., Shaughnessy B., Shaw R., Shawger N., Shay C., Sheehan E., Shen S., Sherman A., Shiao B., Shih H.-Y., Shivaei I., Sienkiewicz M., Sing D., Sirianni M., Sivaramakrishnan A., Skipper J., Sloan G.C., Slocum C., Slowinski S., Smith E., Smith E., Smith D., Smith C., Snyder G., Soh W., Tony Sohn S., Soto C., Spencer R., Stallcup S., Stansberry J., Starr C., Starr E., Stewart A., Stiavelli M., Straughn A., Strickland D., Stys J., Summers F., Sun F., Sunnquist B., Swade D., Swam M., Swaters R., Swoish R., Taylor J.M., Taylor R., Te Plate M., Tea M., Teague K., Telfer R., Temim T., Thatte D., Thompson C., Thompson L., Thomson S., Tikkanen T., Tippet W., Todd C., Toolan S., Tran H., Trejo E., Truong J., Tsukamoto C., Tustain S., Tyra H., Ubeda L., Underwood K., Uzzo M., Van Campen J., Vandal T., Vandenbussche B., Vila B., Volk K., Wahlgren G., Waldman M., Walker C., Wander M., Warfield C., Warner G., Wasiak M., Watkins M., Weaver A., Weilert M., Weiser N., Weiss B., Weissman S., Welty A., West G., Wheate L., Wheatley E., Wheeler T., White R.,

Whiteaker K., Whitehouse P., Whiteleather J., Whitman W., Williams C., Willmer C., Willoughby S., Wilson A., Wirth G., Wislowski E., Wolf E., Wolfe D., Wolff S., Workman B., Wright R., Wu C., Wu R., Wymer K., Yates K., Yeager C., Yeates J., Yerger E., Yoon J., Young A., Yu S., Zak D., Zeidler P., Zhou J., Zielinski T., Zincke C., Zonak S. "The Science Performance of JWST as Characterized in Commissioning" Publications of the Astronomical Society of the Pacific, 135 (1046), art. no. 048001

Rinaldi P., Caputi K.I., Costantin L., Gillman S., Iani E., Pérez-González P.G., Östlin G., Colina L., Greve T.R., Noorgard-Nielsen H.U., Wright G.S., Alonso-Herrero A., Álvarez-Márquez J., Eckart A., García-Marín M., Hjorth J., Ilbert O., Kendrew S., Labiano A., Le Fèvre O., Pye J., Tikkanen T., Walter F., van der Werf P., Ward M., Annunziatella M., Azzollini R., Bik A., Boogaard L., Bosman S.E.I., Gómez A.C., Jermann I., Langeroodi D., Melinder J., Meyer R.A., Moutard T., Peissker F., Topinka M., van Dishoeck E., Güdel M., Henning T., Lagage P.-O., Ray T., Vandenbussche B., Waelkens C., Navarro-Carrera R., Kokorev V. "MIDIS: Strong (Hβ+[O iii]) and Hα Emitters at Redshift $z \simeq 7$-8 Unveiled with JWST NIRCam and MIRI Imaging in the Hubble eXtreme Deep Field" Astrophysical Journal, 952 (2), art. no. 143

Rivilla V.M., Sanz-Novo M., Jiménez-Serra I., Martín-Pintado J., Colzi L., Zeng S., Megías A., López-Gallifa Á., Martínez-Henares A., Massalkhi S., Tercero B., De Vicente P., Martín S., Andrés D.S., Requena-Torres M.A., Alonso J.L. "First Glycine Isomer Detected in the Interstellar Medium: Glycolamide (NH2C(O)CH2OH)" Astrophysical Journal Letters, 953 (2), art. no. L20

Rizzo J.R., Bordiu C., Buemi C., Leto P., Ingallinera A., Bufano F., Umana G., Cerrigone L., Trigilio C. "The rich molecular environment of the luminous blue variable star AFGL 2298" Astronomy and Astrophysics, 678, art. no. A55

Robertson B.E., Tacchella S., Johnson B.D., Hainline K., Whitler L., Eisenstein D.J., Endsley R., Rieke M., Stark D.P., Alberts S., Dressler A., Egami E., Hausen R., Rieke G., Shivaei I., Williams C.C., Willmer C.N.A., Arribas S., Bonaventura N., Bunker A., Cameron A.J., Carniani S., Charlot S., Chevallard J., Curti M., Curtis-Lake E., D'Eugenio F., Jakobsen P., Looser T.J., Lützgendorf N., Maiolino R., Maseda M.V., Rawle T., Rix H.-W., Smit R., Übler H., Willott C., Witstok J., Baum S., Bhatawdekar R., Boyett K., Chen Z., de Graaff A., Florian M., Helton J.M., Hviding R.E., Ji Z., Kumari N., Lyu J., Nelson E., Sandles L., Saxena A., Suess K.A., Sun F., Topping M., Wallace I.E.B. "Identification and properties of intense star-forming galaxies at redshifts $z > 10$" Nature Astronomy, 7 (5), pp. 611 – 621

Rodríguez Del Pino B., Arribas S., Chies-Santos A.L., Lamperti I., Perna M., Vílchez J.M. "The impact of environmental effects on active galactic nuclei: A decline in the incidence of ionized outflows" Astronomy and Astrophysics, 675, art. no. A41

Rodríguez-Baras M., Esplugues G., Fuente A., Spezzano S., Caselli P., Loison J.C., Roueff E., Navarro-Almaida D., Bachiller R., Martín-Doménech R., Jiménez-Serra I., Beitia-Antero L., Le Gal R. "Gas phase Elemental abundances in Molecular cloudS (GEMS): IX. Deuterated compounds of H2S in starless cores" Astronomy and Astrophysics, 679, art. no. A120

Rodriguez-Manfredi J.A., de la Torre Juarez M., Sanchez-Lavega A., Hueso R., Martinez G., Lemmon M.T., Newman C.E., Munguira A., Hieta M., Tamppari L.K., Polkko J., Toledo D., Sebastian E., Smith M.D., Jaakonaho I., Genzer M., De Vicente-Retortillo A., Viudez-Moreiras D., Ramos M., Saiz-Lopez A., Lepinette A., Wolff M., Sullivan R.J., Gomez-Elvira J., Apestigue V., Conrad P.G., Del Rio-Gaztelurrutia T., Murdoch N., Arruego I., Banfield D., Boland J., Brown A.J., Ceballos J., Dominguez-Pumar M., Espejo S., Fairén A.G., Ferrandiz R., Fischer E., Garcia-Villadangos M., Gimenez S., Gomez-Gomez F., Guzewich S.D., Harri A.-M., Jimenez J.J., Jimenez V., Makinen T., Marin M., Martin C., Martin-Soler J., Molina A., Mora-Sotomayor L., Navarro S., Peinado V., Perez-Grande I., Pla-Garcia J., Postigo M., Prieto-Ballesteros O., Rafkin S.C.R., Richardson M.I., Romeral J., Romero C., Savijärvi H., Schofield J.T., Torres J., Urqui R., Zurita S. "The diverse meteorology of Jezero crater over the first 250 sols of Perseverance on Mars" Nature Geoscience, 16 (1), pp. 19 – 28

Rollano V., de Ory M.C., Gomez A., Gonzalez E.M., Pribulová Z., Marcin M., Samuely P., Sanchez-Santolino G., Torres-Pardo A., Mompean F., García-Hernández M., Guillamón I., Suderow H., Menghini M., Vicent J.L. "Enhancement of vortex liquid phase and reentrant behavior in NiBi3 single crystals" Superconductor Science and Technology, 36 (4), art. no. 045012

Romero-Guzmán C., Pérez-Grande I., Rodríguez-Manfredi J.A. "Thermal model of InSight solar panels in Martian conditions" Acta Astronautica, 202, pp. 476 – 484

Rose C., Kartaltepe J.S., Snyder G.F., Rodriguez-Gomez V., Aaron Yung L.Y., Haro P.A., Bagley M.B., Calabró A., Cleri N.J., Cooper M.C., Costantin L., Croton D., Dickinson M., Finkelstein S.L., Häußler B., Holwerda B.W., Koekemoer A.M., Kurczynski P., Lucas R.A., Mantha K.B., Papovich C., Pérez-González P.G., Pirzkal N., Somerville R.S., Straughn A.N., Tacchella S. "Identifying Galaxy Mergers in Simulated CEERS NIRCam Images Using Random Forests" Astrophysical Journal, 942 (1), art. no. 54

Ruiz-Blas F., Muñoz-Hisado V., Garcia-Lopez E., Moreno A., Bartolomé M., Leunda M., Martinez-Alonso E., Alcázar A., Cid C. "The hidden microbial ecosystem in the perennial ice from a Pyrenean ice cave" Frontiers in Microbiology, 14, art. no. 1110091

Rustamkulov Z., Sing D.K., Mukherjee S., May E.M., Kirk J., Schlawin E., Line M.R., Piaulet C., Carter A.L., Batalha N.E., Goyal J.M., López-Morales M., Lothringer J.D., MacDonald R.J., Moran S.E., Stevenson K.B., Wakeford H.R., Espinoza N., Bean J.L., Batalha N.M., Benneke B., Berta-

Thompson Z.K., Crossfield I.J.M., Gao P., Kreidberg L., Powell D.K., Cubillos P.E., Gibson N.P., Leconte J., Molaverdikhani K., Nikolov N.K., Parmentier V., Roy P., Taylor J., Turner J.D., Wheatley P.J., Aggarwal K., Ahrer E., Alam M.K., Alderson L., Allen N.H., Banerjee A., Barat S., Barrado D., Barstow J.K., Bell T.J., Blecic J., Brande J., Casewell S., Changeat Q., Chubb K.L., Crouzet N., Daylan T., Decin L., Désert J., Mikal-Evans T., Feinstein A.D., Flagg L., Fortney J.J., Harrington J., Heng K., Hong Y., Hu R., Iro N., Kataria T., Kempton E.M.-R., Krick J., Lendl M., Lillo-Box J., Louca A., Lustig-Yaeger J., Mancini L., Mansfield M., Mayne N.J., Miguel Y., Morello G., Ohno K., Palle E., Petit dit de la Roche D.J.M., Rackham B.V., Radica M., Ramos-Rosado L., Redfield S., Rogers L.K., Shkolnik E.L., Southworth J., Teske J., Tremblin P., Tucker G.S., Venot O., Waalkes W.C., Welbanks L., Zhang X., Zieba S. "Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM" Nature, 614 (7949), pp. 659 – 663

Sacchi A., Risaliti G., Miniutti G. "Searching for overlooked TDEs in the 4XMM catalogue" Astronomische Nachrichten, 344 (4), art. no. e220128

Sacchi A., Risaliti G., Miniutti G. "Supersoft luminous X-ray sources in galactic nuclei" Astronomy and Astrophysics, 671, art. no. A33

Sahai R., Bujarrabal V., Quintana-Lacaci G., Reindl N., Van de Steene G., Contreras C.S., Ressler M.E. "The Binary and the Disk: The Beauty is Found within NGC3132 with JWST" Astrophysical Journal, 943 (2), art. no. 110

San Andrés D., Colzi L., Rivilla V.M., García De La Concepción J., Melosso M., Martín-Pintado J., Jiménez-Serra I., Zeng S., Martín S., Requena-Torres M.A. "H2CN/H2NC abundance ratio: a new potential temperature tracer for the interstellar medium" Monthly Notices of the Royal Astronomical Society, 523 (3), pp. 3239 – 3250

Sánchez Gómez S.T., Ormö J., Alwmark C., Holm-Alwmark S., Zachén G., Lilljequist R., Sánchez Garrido J.A. "A possible 5 km wide impact structure with associated 22 km wide exterior collapse terrain in the Alhabia–Tabernas Basin, southeastern Spain" Meteoritics and Planetary Science, 58 (10), pp. 1512 – 1539

Sánchez-España J., Mata M.P., Vegas J., Lozano G., Mediato J., Martínez Martínez J., Galindo I., Sánchez N., del Moral B., Ordóñez B., de Vergara A., Nieto A., Andrés M., Vázquez I., Bellido E., Castillo-Carrión M. "Leaching tests reveal fast aluminum fluoride release from ashfall accumulated in La Palma (Canary Islands, Spain) after the 2021 Tajogaite eruption" Journal of Volcanology and Geothermal Research, 444, art. no. 107959

Sánchez-García L., Lezcano M.Á., Carrizo D., Severino R., García-Villadangos M., Cady S.L., Warren-Rhodes K., Cabrol N.A., Parro V. "Assessing siliceous sinter matrices for long-term preservation of lipid biomarkers in opaline sinter deposits analogous to Mars in El Tatio (Chile)" Science of the Total Environment, 870, art. no. 161765

Sánchez-Lavega A., del Rio-Gaztelurrutia T., Hueso R., Juárez M.D.L.T., Martínez G.M., Harri A.-M., Genzer M., Hieta M., Polkko J., Rodríguez-Manfredi J.A., Lemmon M.T., Pla-García J., Toledo D., Vicente-Retortillo A., Viúdez-Moreiras D., Munguira A., Tamppari L.K., Newman C., Gómez-Elvira J., Guzewich S., Bertrand T., Apéstigue V., Arruego I., Wolff M., Banfield D., Jaakonaho I., Mäkinen T. "Mars 2020 Perseverance Rover Studies of the Martian Atmosphere Over Jezero From Pressure Measurements" Journal of Geophysical Research: Planets, 128 (1), art. no. e2022JE007480

Sanz-Novo M., Rivilla V.M., Jiménez-Serra I., Martín-Pintado J., Colzi L., Zeng S., Megías A., López-Gallifa I., Martínez-Henares A., Massalkhi S., Tercero B., de Vicente P., Martín S., Andrés D.S., Requena-Torres M.A. "Discovery of the Elusive Carbonic Acid (HOCOOH) in Space" Astrophysical Journal, 954 (1), art. no. 3

Sarro L.M., Berihuete A., Smart R.L., Reylé C., Barrado D., García-Torres M., Cooper W.J., Jones H.R.A., Marocco F., Creevey O.L., Sordo R., Bailer-Jones C.A.L., Montegriffo P., Carballo R., Andrae R., Fouesneau M., Lanzafame A.C., Pailler F., Thévenin F., Lobel A., Delchambre L., Korn A.J., Recio-Blanco A., Schultheis M.S., De Angeli F., Brouillet N., Casamiquela L., Contursi G., De Laverny P., García-Lario P., Kordopatis G., Lebreton Y., Livanou E., Lorca A., Palicio P.A., Slezak-Oreshina I., Soubiran C., Ulla A., Zhao H. "Ultracool dwarfs in Gaia DR3" Astronomy and Astrophysics, 669, art. no. A139

Saxena A., Robertson B.E., Bunker A.J., Endsley R., Cameron A.J., Charlot S., Simmonds C., Tacchella S., Witstok J., Willott C., Carniani S., Curtis-Lake E., Ferruit P., Jakobsen P., Arribas S., Chevallard J., Curti M., D'Eugenio F., De Graaff A., Jones G.C., Looser T.J., Maseda M.V., Rawle T., Rix H.-W., Del Pino B.R., Smit R., Ubler H., Eisenstein D.J., Hainline K., Hausen R., Johnson B.D., Rieke M., Williams C.C., Willmer C.N.A., Baker W.M., Bhatawdekar R., Bowler R., Boyett K., Chen Z., Egami E., Ji Z., Kumari N., Nelson E., Perna M., Sandles L., Scholtz J., Shivaei I. "JADES: Discovery of extremely high equivalent width Lyman- α emission from a faint galaxy within an ionized bubble at z = 7.3" Astronomy and Astrophysics, 678, art. no. A68

Schultheis M., Zhao H., Zwitter T., Bailer-Jones C.A.L., Carballo R., Sordo R., Drimmel R., Ordenovic C., Pailler F., Fouesneau M., Creevey O.L., Heiter U., Recio-Blanco A., Kordopatis G., De Laverny P., Marshall D.J., Dharmawardena T.E., Brown A.G.A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Barbier A., Biermann M., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U., Lindegren L., Luri X., Mignard F., Randich S., Sartoretti P., Smiljanic R., Tanga P., Walton N.A., Bastian U., Cropper M., Katz D., Soubiran C., Van Leeuwen F., Andrae R., Audard M., Bakker J., Blomme R., Castañeda J., De Angeli F., Fabricius C., Frémat Y., Galluccio L., Guerrier A., Masana E., Messineo R., Nicolas C., Nienartowicz K., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Benson K., Berthier J., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Delchambre L., Dell'oro A., Fraile Garcia E., Garabato D., García-Lario P., Garralda Torres N., Gavras P., Haigron R., Hambly N.C., Harrison D.L., Hatzidimitriou D., Hernández J., Hodgkin S.T., Holl B., Jamal S., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Lorca A., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Nuñez Campos M., Oreshina-Slezak I., Osborne P., Pancino E., Pauwels T., Riello M., Rimoldini L., Robin A.C., Roegiers T., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Weingrill K., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Antoja T., Baines D., Baker S.G., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bashi D., Bauchet N., Baudeau N., Becciani U., Bedin L.R., Bellas-Velidis I., Bellazzini M., Beordo W., Berihuete A., Bernet M., Bertolotto C., Bertone S., Bianchi L., Binnenfeld A., Blazere A., Boch T., Bombrun A., Bouquillon S., Bragaglia A., Braine J., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cannizzo S., Carlucci T., Carnerero M.I., Carrasco J.M., Carretero J., Carton S., Casamiquela L., Castellani M., Castro-Ginard A., Cesare V., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Collins R., Contursi G., Cooper W.J., Cornez T., Crosta M., Crowley C., Dafonte C., De Luise F., De March R., De Souza R., De Torres A., Del Peloso E.F., Delbo M., Delgado A., Diakite S., Diener C., Distefano E., Dolding C., Dsilva K., Durán J., Enke H., Esquej P., Fabre C., Fabrizio M., Faigler S., Fatović M., Fedorets G., Fernández-Hernández J., Fernique P., Figueras F., Fournier Y., Fouron C., Gai M., Galinier M., Garcia-Gutierrez A., García-Torres M., Garofalo A., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., Gosset E., Granvik M., Gregori Barrera V., Gutiérrez-Sánchez R., Haywood M., Helmer A., Helmi A., Henares K., Hidalgo S.L., Hilger T., Hobbs D., Hottier C., Huckle H.E., Jabłońska M., Jansen F., Jiménez-Arranz Ó., Juaristi Campillo J., Khanna S., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kun M., Lambert S., Lanza A.F., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Lecoeur-Taibi I., Lecoutre G., Liao S., Liberato L., Licata E., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Loup C., Mahy L., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marín Pina D., Marinoni S., Martín Lozano J., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Meichsner J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Mowlavi N., Munoz D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Nieto S., Noval L., Ogden A., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Panem C., Payne-Wardenaar S., Pegoraro L., Penttilä A., Pesciullesi P., Piersimoni A.M., Pinamonti M., Pineau F.-X., Plachy E., Plum G., Poggio E., Pourbaix D., Prša A., Pulone L., Racero E., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Ratajczak M., Re Fiorentin P., Regibo S., Reylé C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin C., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sarrate Riera C., Sciacca E., Segovia J.C., Ségransan D., Shahaf S., Siebert A., Siltala L., Slezak E., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spina L., Spitoni E., Spoto F., Squillante L.A., Steele I.A., Steidelmüller H., Surdej J., Szabados L., Taris F., Taylor M.B., Teixeira R., Tisanić K., Tolomei L., Torra F., Torralba Elipe G., Trabucchi M., Tsantaki M., Ulla A., Unger N., Vanel O., Vecchiato A., Vicente D., Voutsinas S., Weiler M., Wyrzykowski L., Zorec J., Balaguer-Núñez L., Leclerc N., Morgenthaler S., Robert G., Zucker S. “Gaia Focused Product Release: Spatial distribution of two diffuse interstellar bands” Astronomy and Astrophysics, 680, art. no. A38

Schultheis M., Zhao H., Zwitter T., Marshall D.J., Drimmel R., Frémat Y., Bailer-Jones C.A.L., Recio-Blanco A., Kordopatis G., De Laverny P., Andrae R., Dharmawardena T.E., Fouesneau M., Sordo R., Brown A.G.A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bastian U., Jansen F., Katz D., Lattanzi M.G., Van Leeuwen F., Bakker J., Cacciari C., Castañeda J., De Angeli F., Fabricius C., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., De Teodoro P., Nuñez Campos M., Delchambre L., Dell Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., Janßen K., Jevardat De Fombelle G., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Reylé C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Anglada Varela E., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Del Pozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Diakite S., Diener C., Distefano E., Dolding C., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Håadczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-Antoine Piccolo A., Jiménez-Arranz Ã., Juaristi Campillo J., Julbe F., Karbevska L., Kervella P., Khanna S., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszynska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., Madrero Pardo P., Magdaleno Romeo A., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., Marcos Santos M.M.S., Marín Pina D., Marinoni S., Marocco F., Martin Polo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., Peñalosa Esteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Re Fiorentin P., Regibo S., Richards P.J., Rios Diaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Salguero E., Samaras N., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., Torralba Elipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., Van Dillen E., Van Reeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski L., Yoldas A., Yvard P., Zorec J., Zucker S. "Gaia Data Release 3: Exploring and mapping the diffuse interstellar band at 862 nm" Astronomy and Astrophysics, 674, art. no. A40

Sebastian D., Swayne M.I., Maxted P.F.L., Triaud A.H.M.J., Sousa S.G., Olofsson G., Beck M., Billot N., Hoyer S., Gill S., Heidari N., Martin D.V., Persson C.M., Standing M.R., Alibert Y., Alonso R., Anglada G., Asquier J., Bárczy T., Barrado D., Barros S.C.C., Battley M.P., Baumjohann W., Beck T., Benz W., Bergomi M., Boisse I., Bonfils X., Brandeker A., Broeg C., Cabrera J., Charnoz S., Collier Cameron A., Csizmadia S., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Dransfield G., Ehrenreich D., Erikson A., Fortier A., Fossati L., Fridlund M., Gandolfi D., Gillon M., Güdel M., Hasiba J., Hébrard G., Heng K., Isaak K.G., Kiss L.L., Kopp E., Kunovac V., Laskar J., Lecavelier Des Etangs A., Lendl M., Lovis C., Magrin D., McCormac J., Miller N.J., Nascimbeni V., Ottensamer R., Pagano I., Pallé E., Pepe F.A., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Lalitha S., Santerne A., Santos N.C., Scandariato G., Ségransan D., Simon A.E., Smith A.M.S., Steller M., Szabó G.M., Thomas N., Udry S., Van Grootel V., Walton N.A. "The EBLM project - IX. Five fully convective M-dwarfs, precisely measured with CHEOPS and TESS light curves" Monthly Notices of the Royal Astronomical Society, 519 (3), pp. 3546 – 3563

Seidel J.V., Borsa F., Pino L., Ehrenreich D., Stangret M., Osorio M.R.Z., Palle E., Alibert Y., Allart R., Bourrier V., Di Marcantonio P., Figueira P., Hernández J.I.G., Lillo-Box J., Lovis C., Martins C.J.A.P., Mehner A., Molaro P., Nunes N.J., Pepe F., Santos N.C., Sozzetti A. "Detection of a high-velocity sodium feature on the ultra-hot Jupiter WASP-121 b" Astronomy and Astrophysics, 673, art. no. A125

Severino R., Moreno-Paz M., Puente-Sánchez F., Sánchez-García L., Risso V.A., Sanchez-Ruiz J.M., Cabrol N., Parro V. "Immunoanalytical Approach for Detecting and Identifying Ancestral Peptide Biomarkers in Early Earth Analogue Environments" Analytical Chemistry, 95 (12), pp. 5323 – 5330

Sha L., Vanderburg A.M., Huang C.X., Armstrong D.J., Brahm R., Giacalone S., Wood M.L., Collins K.A., Nielsen L.D., Hobson M.J., Ziegler C., Howell S.B., Torres-Miranda P., Mann A.W., Zhou G., Delgado-Mena E., Rojas F.I., Abe L., Trifonov T., Adibekyan V., Sousa S.G., Fajardo-Acosta S.B., Guillot T., Howard S., Littlefield C., Hawthorn F., Schmider F.-X., Eberhardt J., Tan T.-G., Osborn A., Schwarz R.P., Strøm P., Jordán A., Wang G., Henning T., Massey B., Law N., Stockdale C., Furlan E., Srdoc G., Wheatley P.J., Barrado Navascus D., Lissauer J.J., Stassun K.G., Ricker G.R., Vanderspek R.K., Latham D.W., Winn J.N., Seager S., Jenkins J.M., Barclay T., Bouma L.G., Christiansen J.L., Guerrero N., Rose M.E. "TESS spots a mini- interior to a hot saturn in the TOI-2000 system" Monthly Notices of the Royal Astronomical Society, 524 (1), pp. 1113 – 1138

Shen L., Papovich C., Yang G., Matharu J., Wang X., Magnelli B., Elbaz D., Jogee S., Alavi A., Arrabal Haro P., Backhaus B.E., Bagley M.B., Bell E.F., Bisigello L., Calabrò A., Cooper M.C., Costantin L., Daddi E., Dickinson M., Finkelstein S.L., Fujimoto S., Giavalisco M., Grogin N.A., Guo Y., Holwerda B.W., Kartaltepe J.S., Koekemoer A.M., Kurczynski P., Lucas R.A., Pérez-González P.G., Pirzkal N., Prichard L., Rafelski M., Ronayne K., Simons R.C., Sunnquist B., Teplitz H.I., Trump J.R., Weiner B.J., Windhorst R.A., Yung L.Y.A. "CEERS: Spatially Resolved UV and Mid-infrared Star Formation in Galaxies at 0.2 < z < 2.5: The Picture from the Hubble and James Webb Space Telescopes" Astrophysical Journal, 950 (1), art. no. 7

Shenar T., Sana H., Crowther P.A., Bostroem K.A., Mahy L., Najarro F., Oskinova L., Sander A.A.C. "Constraints on the multiplicity of the most massive stars known: R136 a1, a2, a3, and c" Astronomy and Astrophysics, 679, art. no. A36

Simon J.I., Hickman-Lewis K., Cohen B.A., Mayhew L.E., Shuster D.L., Debaille V., Hausrath E.M., Weiss B.P., Bosak T., Zorzano M.-P., Amundsen H.E.F., Beegle L.W., Bell J.F., III, Benison K.C., Berger E.L., Beyssac O., Brown A.J., Calef F., Casademont T.M., Clark B., Clavé E., Crumpler L., Czaja A.D., Fairén A.G., Farley K.A., Flannery D.T., Fornaro T., Forni O., Gómez F., Goreva Y., Gorin A., Hand K.P., Hamran S.-E., Henneke J., Herd C.D.K., Horgan B.H.N., Johnson J.R., Joseph J., Kronyak R.E., Madariaga J.M., Maki J.N., Mandon L., McCubbin F.M., McLennan S.M., Moeller R.C., Newman C.E., Núñez J.I., Pascuzzo A.C., Pedersen D.A., Poggiali G., Pinet P., Quantin-Nataf C., Rice M., Rice J.W., Jr., Royer C., Schmidt M., Sephton M., Sharma S., Siljeström S., Stack K.M., Steele A., Sun V.Z., Udry A., VanBommel S., Wadhwa M., Wiens R.C., Williams A.J., Williford K.H. "Samples Collected From the Floor of Jezero Crater With the Mars 2020 Perseverance Rover" Journal of Geophysical Research: Planets, 128 (6), art. no. e2022JE007474

Sipilä O., Colzi L., Roueff E., Caselli P., Fontani F., Wirström E. "Combined model for 15N, 13C, and spin-state chemistry in molecular clouds" Astronomy and Astrophysics, 678, art. no. A120

Skaf N., Boccaletti A., Pantin E., Thebault P., Kral Q., Danielski C., Galicher R., Milli J., Lagrange A.-M., Baruteau C., Kenworthy M., Absil O., Langlois M., Olofsson J., Chauvin G., Huelamo N., Delorme P., Charnay B., Guyon O., Bonnefoy M., Cantalloube F., Hoeijmakers H.J., Käufl U., Kasper M., Maire A.-L., Mâlin M., Siebenmorgen R., Snellen I., Zins G. "The β Pictoris system: Setting constraints on the planet and the disk structures at mid-IR wavelengths with NEAR" Astronomy and Astrophysics, 675, art. no. A35

Smith M.D., Martínez G.M., Sebastián E., Lemmon M.T., Wolff M.J., Apéstigue V., Arruego I., Toledo D., Viúdez-Moreiras D., Rodriguez-Manfredi J.A., Juarez M.D.L.T. "Diurnal and Seasonal Variations of Aerosol Optical Depth Observed by MEDA/TIRS at Jezero Crater, Mars" Journal of Geophysical Research: Planets, 128 (1), art. no. e2022JE007560

Smoker J.V., Müller A., Monreal Ibero A., Elyajouri M., Evans C.J., Najarro F., Farhang A., Cox N.L.J., Minniti J., Smith K.T., Pritchard J., Lallement R., Smette A., Boffin H.M.J., Cordiner M., Cami J. "A high-resolution study of near-IR diffuse interstellar bands, search for small-scale structure, time variability, and stellar features" Astronomy and Astrophysics, 672, art. no. A181

Solano E., Novalbos I., Ros A.J., Cortés-Contreras M., Rodrigo C. "Confirmation and characterization of neglected WDS systems using Gaia data release 3 and the virtual observatory" Astronomische Nachrichten, 344 (10), art. no. e20230116

Sowicka P., Handler G., Jones D., Caldwell J.A.R., van Wyk F., Paunzen E., Bąkowska K., Peralta de Arriba L., Suárez-Andrés L., Werner K., Karjalainen M., Holdsworth D.L. "The GW Vir Instability Strip in Light of New Observations of PG 1159 Stars: Discovery of Pulsations in the Central Star of A72 and Variability of RX J0122.9-7521" Astrophysical Journal, Supplement Series, 269 (1), art. no. 32

Stoker C.R., Glass B.J., Stucky T.R., Dave A.I., Kobayashi L.T., Quinn R.C., Moreno-Paz M., Sánchez-García L., Mora M.F., Kehl F., Parro V., Willis P.A., Davila A., Dobrea E.N., Rask J.C., Ricardo D. "A Mission Simulating the Search for Life on Mars with Automated Drilling, Sample Handling, and Life Detection Instruments Performed in the Hyperarid Core of the Atacama Desert, Chile" Astrobiology, 23 (12), pp. 1284 – 1302

Stott A.E., Murdoch N., Gillier M., Banfield D., Bertrand T., Chide B., De la Torre Juarez M., Hueso R., Lorenz R., Martinez G., Munguira A., Mora Sotomayor L., Navarro S., Newman C., Pilleri P., Pla-Garcia J., Rodriguez-Manfredi J.A., Sanchez-Lavega A., Smith M., Viudez Moreiras D., Williams N., Maurice S., Wiens R.C., Mimoun D. "Wind and Turbulence Observations With the Mars Microphone on Perseverance" Journal of Geophysical Research: Planets, 128 (5), art. no. e2022JE007547

Sturkell E., Ormö J., Hegardt E.A., Stockmann G., Meland E., Wikström T. "The Proximal Ejecta Around the Marine-Target Lockne Impact Structure, Sweden" Journal of Geophysical Research: Planets, 128 (7), art. no. e2023JE007777

Šubjak J., Lodieu N., Kabáth P., Boffin H.M.J., Nowak G., Grundahl F., Béjar V.J.S., Zapatero Osorio M.R., Antoci V. "Search for planets around stars with wide brown dwarfs" Astronomy and Astrophysics, 671, art. no. A10

Sulis S., Lendl M., Cegla H.M., Rodríguez Díaz L.F., Bigot L., Van Grootel V., Bekkelien A., Cameron A.C., Maxted P.F.L., Simon A.E., Lovis C., Scandariato G., Bruno G., Nardiello D., Bonfanti A., Fridlund M., Persson C.M., Salmon S., Sousa S.G., Wilson T.G., Krenn A., Hoyer S., Santerne A., Ehrenreich D., Alibert Y., Alonso R., Anglada G., Bárczy T., Barrado Y Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Bonfils X., Borsato L., Brandeker A., Broeg C., Cabrera J., Charnoz S., Corral Van Damme C., Csizmadia S., Davies M.B., Deleuil M., Deline A., Delrez L., Demangeon O.D.S., Demory B.-O., Erikson A., Fortier A., Fossati L., Gandolfi D., Gillon M., Güdel M., Heng K., Isaak K.G., Kiss L.L., Laskar J., Lecavelier Des Etangs A., Magrin D., Munari M., Nascimbeni V., Olofsson G., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Rieder M., Santos N.C., Ségransan D., Smith A.M.S., Steinberger M., Steller M., Szabó G.M., Thomas N., Udry S., Walton N.A., Wolter D. "Connecting photometric and spectroscopic granulation signals with CHEOPS and ESPRESSO" Astronomy and Astrophysics, 670, art. no. A24

Sun F., Egami E., Pirzkal N., Rieke M., Baum S., Boyer M., Boyett K., Bunker A.J., Cameron A.J., Curti M., Eisenstein D.J., Gennaro M., Greene T.P., Jaffe D., Kelly D., Koekemoer A.M., Kumari N., Maiolino R., Maseda M., Perna M., Rest A., Robertson B.E., Schlawin E., Smit R., Stansberry J., Sunnquist B., Tacchella S., Williams C.C., Willmer C.N.A. "First Sample of Hα+[O iii]λ5007 Line Emitters at z > 6 Through JWST/NIRCam Slitless Spectroscopy: Physical Properties and Line-luminosity Functions" Astrophysical Journal, 953 (1), art. no. 53

Sun V.Z., Hand K.P., Stack K.M., Farley K.A., Simon J.I., Newman C., Sharma S., Liu Y., Wiens R.C., Williams A.J., Tosca N., Alwmark S., Beyssac O., Brown A., Calef F., Cardarelli E.L., Clavé E., Cohen B., Corpolongo A., Czaja A.D., Del Sesto T., Fairen A., Fornaro T., Fouchet T., Garczynski B., Gupta S., Herd C.D.K., Hickman-Lewis K., Horgan B., Johnson J., Kinch K., Kizovski T., Kronyak R., Lange R., Mandon L., Milkovich S., Moeller R., Núñez J., Paar G., Pyrzak G., Quantin-Nataf C., Shuster D.L., Siljestrom S., Steele A., Tice M., Toupet O., Udry A., Vaughan A., Wogsland B. "Overview and Results From the Mars 2020 Perseverance Rover's First Science Campaign on the Jezero Crater Floor" Journal of Geophysical Research: Planets, 128 (6), art. no. e2022JE007613

Tabone B., Bettoni G., van Dishoeck E.F., Arabhavi A.M., Grant S., Gasman D., Henning T., Kamp I., Güdel M., Lagage P.O., Ray T., Vandenbussche B., Abergel A., Absil O., Argyriou I., Barrado D., Boccaletti A., Bouwman J., Caratti o Garatti A., Geers V., Glauser A.M., Justannont K., Lahuis

F., Mueller M., Nehmé C., Olofsson G., Pantin E., Scheithauer S., Waelkens C., Waters L.B.F.M., Black J.H., Christiaens V., Guadarrama R., Morales-Calderón M., Jang H., Kanwar J., Pawellek N., Perotti G., Perrin A., Rodgers-Lee D., Samland M., Schreiber J., Schwarz K., Colina L., Östlin G., Wright G. "A rich hydrocarbon chemistry and high C to O ratio in the inner disk around a very low-mass star" Nature Astronomy, 7 (7), pp. 805 – 814

Tacchella S., Johnson B.D., Robertson B.E., Carniani S., D'Eugenio F., Kumari N., Maiolino R., Nelson E.J., Suess K.A., Übler H., Williams C.C., Adebusola A., Alberts S., Arribas S., Bhatawdekar R., Bonaventura N., Bowler R.A.A., Bunker A.J., Cameron A.J., Curti M., Egami E., Eisenstein D.J., Frye B., Hainline K., Helton J.M., Ji Z., Looser T.J., Lyu J., Perna M., Rawle T., Rieke G., Rieke M., Saxena A., Sandles L., Shivaei I., Simmonds C., Sun F., Willmer C.N.A., Willott C.J., Witstok J. "JWST NIRCam + NIRSpec: Interstellar medium and stellar populations of young galaxies with rising star formation and evolving gas reservoirs" Monthly Notices of the Royal Astronomical Society, 522 (4), pp. 6236 – 6249

Toledo D., Apéstigue V., Arruego I., Lemmon M., Gómez L., Montoro F., Hueso R., Newman C., Smith M., Viudez-Moreiras D., Martínez G., Lorenz R., Vicente-Retortillo A., Sanchez-Lavega A., Juarez M.D.L.T., Rodriguez-Manfredi J.A., Carrasco I., Yela M., Jimenez J.J., García-Menendez E., Navarro S., Gomez-Elvira F.J., Harri A.-M., Polkko J., Hieta M., Genzer M., Murdoch N., Sebastian E. "Dust Devil Frequency of Occurrence and Radiative Effects at Jezero Crater, Mars, as Measured by MEDA Radiation and Dust Sensor (RDS)" Journal of Geophysical Research: Planets, 128 (1), art. no. e2022JE007494

Toledo D., Apéstigue V., Martinez-Oter J., Franchi F., Serrano F., Yela M., de la Torre Juarez M., Rodriguez-Manfredi J.A., Arruego I. "Using the Perseverance MEDA-RDS to identify and track dust devils and dust-lifting gust fronts" Frontiers in Astronomy and Space Sciences, 10, art. no. 1221726

Toledo D., Gómez L., Apéstigue V., Arruego I., Smith M., Munguira A., Martínez G., Patel P., Sanchez-Lavega A., Lemmon M., Tamppari L., Viudez-Moreiras D., Hueso R., Vicente-Retortillo A., Newman C., Lorenz R., Yela M., Juarez M.D.L.T., Rodriguez-Manfredi J.A. "Twilight Mesospheric Clouds in Jezero as Observed by MEDA Radiation and Dust Sensor (RDS)" Journal of Geophysical Research: Planets, 128 (7), art. no. e2023JE007785

Torres S., Cruz P., Murillo-Ojeda R., Jiménez-Esteban F.M., Rebassa-Mansergas A., Solano E., Camisassa M.E., Raddi R., Doliguez Le Lourec J. "White dwarf spectral type-temperature distribution from Gaia DR3 and the Virtual Observatory" Astronomy and Astrophysics, 677, art. no. A159

Trabucchi M., Mowlavi N., Lebzelter T., Lecoeur-Taibi I., Audard M., Eyer L., García-Lario P., Gavras P., Holl B., Jevardat De Fombelle G., Nienartowicz K., Rimoldini L., Sartoretti P., Blomme

R., Frémat Y., Marchal O., Damerdji Y., Brown A.G.A., Guerrier A., Panuzzo P., Katz D., Seabroke G.M., Benson K., Haigron R., Smith M., Lobel A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Babusiaux C., Barbier A., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U., Lindegren L., Luri X., Mignard F., Randich S., Smiljanic R., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Cropper M., Drimmel R., Lattanzi M.G., Soubiran C., Van Leeuwen F., Bakker J., Castañeda J., De Angeli F., Fabricius C., Fouesneau M., Galluccio L., Masana E., Messineo R., Nicolas C., Pailler F., Riclet F., Roux W., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Berthier J., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cheek N., Clementini G., Davidson M., De Teodoro P., Delchambre L., Dell'oro A., Fraile Garcia E., Garabato D., Garralda Torres N., Hambly N.C., Harrison D.L., Hatzidimitriou D., Hernández J., Hodgkin S.T., Jamal S., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Lorca A., Marrese P.M., Moitinho A., Muinonen K., Nuñez Campos M., Oreshina-Slezak I., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Riello M., Robin A.C., Roegiers T., Sarro L.M., Schultheis M., Siopis C., Sozzetti A., Utrilla E., Van Leeuwen M., Weingrill K., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Antoja T., Baines D., Baker S.G., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bashi D., Bauchet N., Baudeau N., Becciani U., Bedin L.R., Bellas-Velidis I., Bellazzini M., Beordo W., Berihuete A., Bernet M., Bertolotto C., Bertone S., Bianchi L., Binnenfeld A., Blazere A., Boch T., Bombrun A., Bouquillon S., Bragaglia A., Braine J., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cannizzo S., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Carretero J., Carton S., Casamiquela L., Castellani M., Castro-Ginard A., Cesare V., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Collins R., Contursi G., Cooper W.J., Cornez T., Crosta M., Crowley C., Dafonte C., David M., De Laverny P., De Luise F., De March R., De Ridder J., De Souza R., De Torres A., Del Peloso E.F., Delbo M., Delgado A., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Dsilva K., Durán J., Enke H., Esquej P., Fabre C., Fabrizio M., Faigler S., Fatović M., Fedorets G., Fernández-Hernández J., Fernique P., Figueras F., Fournier Y., Fouron C., Gai M., Galinier M., Garcia-Gutierrez A., García-Torres M., Garofalo A., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., Gosset E., Granvik M., Gregori Barrera V., Gutiérrez-Sánchez R., Haywood M., Helmer A., Helmi A., Henares K., Hidalgo S.L., Hilger T., Hobbs D., Hottier C., Huckle H.E., Jabłońska M., Jansen F., Jiménez-Arranz Ó., Juaristi Campillo J., Khanna S., Kordopatis G., Kóspál Á., Kostrzewa-Rutkowska Z., Kun M., Lambert S., Lanza A.F., Le Campion J.-F., Lebreton Y., Leccia S., Lecoutre G., Liao S., Liberato L., Licata E., Lindstrøm H.E.P., Lister T.A., Livanou E., Loup C., Mahy L., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marín Pina D., Marinoni S., Marshall D.J., Martín Lozano J., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Meichsner J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Munoz D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Nieto S., Noval L., Ogden A., Ordenovic C., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Panem C., Payne-Wardenaar S., Pegoraro L., Penttilä A., Pesciullesi P., Piersimoni A.M., Pinamonti M., Pineau F.-X., Plachy E., Plum G., Poggio E., Pourbaix D., Prša A., Pulone L., Racero E., Rainer M., Raiteri C.M., Ramos P., Ramos-Lerate M., Ratajczak M., Re Fiorentin P., Regibo S., Reylé C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin C., Romero-Gómez M., Rowell N., Royer F., Ruz Mieres D., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sarrate Riera C., Sciacca E., Segovia J.C., Ségransan D., Shahaf S., Siebert A., Siltala L., Slezak E., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spina L., Spitoni E., Spoto F., Squillante L.A., Steele I.A., Steidelmüller H., Surdej J., Szabados L., Taris F., Taylor M.B., Teixeira R., Tisanić K., Tolomei L., Torra F., Torralba Elipe G., Tsantaki M., Ulla A., Unger N., Vanel O., Vecchiato A., Vicente D., Voutsinas S., Weiler M., Wyrzykowski Ł., Zhao H., Zorec J., Zwitter T., Balaguer-Nunez L., Leclerc N., Morgenthaler S., Robert G., Zucker S. "Gaia Focused Product Release: Radial velocity time series of long-period variables" Astronomy and Astrophysics, 680, art. no. A36

Trasobares J., Martín-Romano J.C., Khaliq M.W., Ruiz-Gómez S., Foerster M., Niño M.Á., Pedraz P., Dappe Y.J., de Ory M.C., García-Pérez J., Acebrón M., Osorio M.R., Magaz M.T., Gomez A., Miranda R., Granados D. "Hybrid molecular graphene transistor as an operando and optoelectronic platform" Nature Communications, 14 (1), art. no. 1381

Trump J.R., Haro P.A., Simons R.C., Backhaus B.E., Amorín R.O., Dickinson M., Fernández V., Papovich C., Nicholls D.C., Kewley L.J., Brunker S.W., Salzer J.J., Wilkins S.M., Almaini O., Bagley M.B., Berg D.A., Bhatawdekar R., Bisigello L., Buat V., Burgarella D., Calabrò A., Casey C.M., Ciesla L., Cleri N.J., Cole J.W., Cooper M.C., Cooray A.R., Costantin L., Croton D., Ferguson H.C., Finkelstein S.L., Fujimoto S., Gardner J.P., Gawiser E., Giavalisco M., Grazian A., Grogin N.A., Hathi N.P., Hirschmann M., Holwerda B.W., Huertas-Company M., Hutchison T.A., Jogee S., Juneau S., Jung I., Kartaltepe J.S., Kirkpatrick A., Kocevski D.D., Koekemoer A.M., Lotz J.M., Lucas R.A., Magnelli B., Matharu J., Pérez-González P.G., Pirzkal N., Rafelski M., Rose C., Seillé L.-M., Somerville R.S., Straughn A.N., Tacchella S., Vanderhoof B.N., Weiner B.J., Wuyts S., Aaron Yung L.Y., Zavala J.A. "The Physical Conditions of Emission-line Galaxies at Cosmic Dawn from JWST/NIRSpec Spectroscopy in the SMACS 0723 Early Release Observations" Astrophysical Journal, 945 (1), art. no. 35

Tuson A., Queloz D., Osborn H.P., Wilson T.G., Hooton M.J., Beck M., Lendl M., Olofsson G., Fortier A., Bonfanti A., Brandeker A., Buchhave L.A., Cameron A.C., Ciardi D.R., Collins K.A., Gandolfi D., Garai Z., Giacalone S., da Silva J.G., Howell S.B., Patel J.A., Persson C.M., Serrano L.M., Sousa S.G., Ulmer-Moll S., Vanderburg A., Ziegler C., Alibert Y., Alonso R., Anglada G., Bárczy T., Navascues D.B., Barros S.C.C., Baumjohann W., Beck T., Benz W., Billot N., Bonfils X., Borsato L., Broeg C., Cabrera J., Charnoz S., Conti D.M., Csizmadia Sz., Cubillos P.E., Davies M.B., Deleuil M., Delrez L., Demangeon O.D.S., Demory B.-O., Dragomir D., Dressing C.D., Ehrenreich D., Erikson A., Essack Z., Farinato J., Fossati L., Fridlund M., Furlan E., Gill H., Gillon M., Gnilka C.L., Gonzales E., Güdel M., Günther M.N., Hoyer S., Isaak K.G., Jenkins J.M., Kiss L.L., Laskar J., Latham D.W., Law N., des Etangs A.L., Curto G.L., Lovis C., Luque R., Magrin D., Mann A.W., Maxted P.F.L., Mayor M., McDermott S., Mecina M., Mordasini C., Mortier A., Nascimbeni V., Ottensamer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Pritchard T., Ragazzoni R., Rando N., Ratti F., Rauer H., Ribas I., Ricker G.R., Rieder M., Santos N.C., Savel A.B., Scandariato G., Schwarz R.P., Seager S., Ségransan D., Shporer A., Simon A.E., Smith A.M.S., Steller M., Stockdale C., Szabó G.M., Thomas N., Torres G., Tronsgaard R., Udry S., Ulmer B., Van Grootel V., Vanderspek R., Venturini J., Walton N.A., Winn J.N., Wohler B. "TESS and CHEOPS discover two warm sub-Neptunes transiting the bright K-dwarf HD 15906" Monthly Notices of the Royal Astronomical Society, 523 (2), pp. 3090 – 3118

Übler H., Maiolino R., Curtis-Lake E., Pérez-González P.G., Curti M., Perna M., Arribas S., Charlot S., Marshall M.A., Dbeugenio F., Scholtz J., Bunker A., Carniani S., Ferruit P., Jakobsen P., Rix H.-W., Rodríguez Del Pino B., Willott C.J., Boeker T., Cresci G., Jones G.C., Kumari N., Rawle T. "GA-NIFS: A massive black hole in a low-metallicity AGN at z ∼ 5.55 revealed by JWST/NIRSpec IFS" Astronomy and Astrophysics, 677, art. no. A145

Udry A., Ostwald A., Sautter V., Cousin A., Beyssac O., Forni O., Dromart G., Benzerara K., Nachon M., Horgan B., Mandon L., Clavé E., Dehouck E., Gibbons E., Alwmark S., Ravanis E., Wiens R.C., Legett C., Anderson R., Pilleri P., Mangold N., Schmidt M., Liu Y., Núñez J.I., Castro K., Madariaga J.M., Kizovski T., Beck P., Bernard S., Bosak T., Brown A., Clegg S., Cloutis E., Cohen B., Connell S., Crumpler L., Debaille V., Flannery D., Fouchet T., Gabriel T.S.J., Gasnault O., Herd C.D.K., Johnson J., Manrique J.A., Maurice S., McCubbin F.M., McLennan S., Ollila A., Pinet P., Quantin-Nataf C., Royer C., Sharma S., Simon J.I., Steele A., Tosca N., Treiman A. "A Mars 2020 Perseverance SuperCam Perspective on the Igneous Nature of the Máaz Formation at Jezero Crater and Link With Séítah, Mars" Journal of Geophysical Research: Planets, 128 (7), art. no. e2022JE007440

Ulamec S., Michel P., Grott M., Böttger U., Schröder S., Hübers H.-W., Cho Y., Rull F., Murdoch N., Vernazza P., Prieto-Ballesteros O., Biele J., Tardivel S., Arrat D., Hagelschuer T., Knollenberg J., Vivet D., Sunday C., Jorda L., Groussin O., Robin C., Miyamoto H. "Science objectives of the MMX rover" Acta Astronautica, 210, pp. 95 – 101

Ulmer-Moll S., Osborn H.P., Tuson A., Egger J.A., Lendl M., Maxted P., Bekkelien A., Simon A.E., Olofsson G., Adibekyan V., Alibert Y., Bonfanti A., Bouchy F., Brandeker A., Fridlund M., Gandolfi D., Mordasini C., Persson C.M., Salmon S., Serrano L.M., Sousa S.G., Wilson T.G., Rieder M., Hasiba J., Asquier J., Sicilia D., Walter I., Alonso R., Anglada G., Barrado Y Navascues D., Barros S.C.C., Baumjohann W., Beck M., Beck T., Benz W., Billot N., Bonfils X., Borsato L., Broeg C., Bárczy T., Cabrera J., Charnoz S., Cointepas M., Cameron A.C., Csizmadia S., Cubillos P.E., Davies M.B., Deleuil M., Deline A., Delrez L., Demangeon O.D.S., Demory B.-O., Dumusque X., Ehrenreich D., Eisner N.L., Erikson A., Fortier A., Fossati L., Gillon M., Grieves N., Güdel M., Hagelberg J., Helled R., Hoyer S., Isaak K.G., Kiss L.L., Laskar J., Des Etangs A.L., Lovis C., Magrin D., Nascimbeni V., Otegi J., Ottensammer R., Pagano I., Pallé E., Peter G., Piotto G., Pollacco D., Psaridi A., Queloz D., Ragazzoni R., Rando N., Rauer H., Ribas I., Santos N.C., Scandariato G., Smith A.M.S., Steller M., Szabó G.M., Ségransan D., Thomas N., Udry S., Van Grootel V., Venturini J., Walton N.A. "TOI-5678b: A 48-day transiting Neptune-mass planet characterized with CHEOPS and HARPS" Astronomy and Astrophysics, 674, art. no. A43

Vallenari A., Brown A.G.A., Prusti T., deBruijne J.H.J., Arenou F., Babusiaux C., Biermann M., Creevey O.L., Ducourant C., Evans D.W., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U.L., Lindegren L., Luri X., Mignard F., Panem C., Pourbaix D., Randich S., Sartoretti P., Soubiran C., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Drimmel R., Jansen F., Katz D., Lattanzi M.G., vanLeeuwen F., Bakker J., Cacciari C., Castañeda J., DeAngeli F., Fabricius C., Fouesneau M., Frémat Y., Galluccio L., Guerrier A., Heiter U., Masana E., Messineo R., Mowlavi N., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Andrae R., Audard M., Bellas-Velidis I., Benson K., Berthier J., Blomme R., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cellino A., Cheek N., Clementini G., Damerdji Y., Davidson M., deTeodoro P., NuñezCampos M., Delchambre L., Dell'Oro A., Esquej P., Fernández-Hernández J., Fraile E., Garabato D., García-Lario P., Gosset E., Haigron R., Halbwachs J.-L., Hambly N.C., Harrison D.L., Hernández J., Hestroffer D., Hodgkin S.T., Holl B., Janßen K., JevardatdeFombelle G., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Reylé C., Riello M., Rimoldini L., Roegiers T., Rybizki J., Sarro L.M., Siopis C., Smith M., Sozzetti A., Utrilla E., vanLeeuwen M., Abbas U., Ábrahám P., AbreuAramburu A., Aerts C., Aguado J.J., Ajaj M., Aldea-Montero F., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., AngladaVarela E., Antoja T., Baines D., Baker S.G., Balaguer-Núñez L., Balbinot E., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bassilana J.-L., Bauchet N., Becciani U., Bellazzini M., Berihuete A., Bernet M., Bertone S., Bianchi L., Binnenfeld A., Blanco-Cuaresma S., Blazere A., Boch T., Bombrun A., Bossini D., Bouquillon S., Bragaglia A., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Burlacu A., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Casamiquela L., Castellani M., Castro-Ginard A., Chaoul L., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Comoretto G., Contursi G., Cooper W.J., Cornez T., Cowell S., Crifo F., Cropper M., Crosta M., Crowley C., Dafonte C., Dapergolas A., David M., David P., deLaverny P., DeLuise F., DeMarch R., DeRidder J., deSouza R., deTorres A., delPeloso E.F., delPozo E., Delbo M., Delgado A., Delisle J.-B., Demouchy C., Dharmawardena T.E., DiMatteo P., Diakite S., Diener C., Distefano E., Dolding C., Edvardsson B., Enke H., Fabre C., Fabrizio M., Faigler S., Fedorets G., Fernique P., Fienga A., Figueras F., Fournier Y., Fouron C., Fragkoudi F., Gai M., Garcia-Gutierrez A., Garcia-Reinaldos M., García-Torres M., Garofalo A., Gavel A., Gavras P., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., González-Vidal J.J., Granvik M., Guillout P., Guiraud J., Gutiérrez-Sánchez R., Guy L.P., Hatzidimitriou D., Hauser M., Haywood M., Helmer A., Helmi A., Sarmiento M.H., Hidalgo S.L., Hilger T., Hładczuk N., Hobbs D., Holland G., Huckle H.E., Jardine K., Jasniewicz G., Jean-AntoinePiccolo A., Jiménez-Arranz Ó., Jorissen A., JuaristiCampillo J., Julbe F., Karbevska L., Kervella P., Khanna S., Kontizas M., Kordopatis G., Korn A.J., Kóspál Á., Kostrzewa-Rutkowska Z., Kruszyńska K., Kun M., Laizeau P., Lambert S., Lanza A.F., Lasne Y., LeCampion J.-F., Lebreton Y., Lebzelter T., Leccia S., Leclerc N., Lecoeur-Taibi I., Liao S., Licata E.L., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Lorca A., Loup C., MadreroPardo P., MagdalenoRomeo A., Managau S., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marcos J., MarcosSantos M.M.S., MarínPina D., Marinoni S., Marocco F., Marshall D.J., MartinPolo L., Martín-Fleitas J.M., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Messina S., Michalik D., Millar N.R., Mints A., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Noval L., Ocaña F., Ogden A., Ordenovic C., Osinde J.O., Pagani C., Pagano I., Palaversa L., Palicio P.A., Pallas-Quintela L., Panahi A., Payne-Wardenaar S., PeñalosaEsteller X., Penttilä A., Pichon B., Piersimoni A.M., Pineau F.-X., Plachy E., Plum G., Poggio E., Prša A., Pulone L., Racero E., Ragaini S., Rainer M., Raiteri C.M., Rambaux N., Ramos P., Ramos-Lerate M., ReFiorentin P., Regibo S., Richards P.J., RiosDiaz C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin A.C., Robin C., Roelens M., Rogues H.R.O., Rohrbasser L., Romero-Gómez M., Rowell N., Royer

F., RuzMieres D., Rybicki K.A., Sadowski G., SáezNúñez A., SagristàSellés A., Sahlmann J., Salguero E., Samaras N., SanchezGimenez V., Sanna N., Santoveña R., Sarasso M., Schultheis M., Sciacca E., Segol M., Segovia J.C., Ségransan D., Semeux D., Shahaf S., Siddiqui H.I., Siebert A., Siltala L., Silvelo A., Slezak E., Slezak I., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spagna A., Spina L., Spoto F., Steele I.A., Steidelmüller H., Stephenson C.A., Süveges M., Surdej J., Szabados L., Szegedi-Elek E., Taris F., Taylor M.B., Teixeira R., Tolomei L., Tonello N., Torra F., Torra J., TorralbaElipe G., Trabucchi M., Tsounis A.T., Turon C., Ulla A., Unger N., Vaillant M.V., vanDillen E., vanReeven W., Vanel O., Vecchiato A., Viala Y., Vicente D., Voutsinas S., Weiler M., Wevers T., Wyrzykowski Ł., Yoldas A., Yvard P., Zhao H., Zorec J., Zucker S., Zwitter T. "Gaia Data Release 3: Summary of the content and survey properties" Astronomy and Astrophysics, 674, art. no. A1

Van Der Swaelmen M., Viscasillas Vázquez C., Cescutti G., Magrini L., Cristallo S., Vescovi D., Randich S., Tautvaišiene G., Bagdonas V., Bensby T., Bergemann M., Bragaglia A., Drazdauskas A., Jiménez-Esteban F., Guiglion G., Korn A., Masseron T., Minkeviiute R., Smiljanic R., Spina L., Stonkute E., Zaggia S. "The Gaia -ESO survey: Placing constraints on the origin of r -process elements" Astronomy and Astrophysics, 670, art. no. A129

Vanzella E., Loiacono F., Bergamini P., Mestriac U., Castellano M., Rosati P., Meneghetti M., Grillo C., Calura F., Mignoli M., Bradač M., Adamo A., Rihtaršič G., Dickinson M., Gronke M., Zanella A., Annibali F., Willott C., Messa M., Sani E., Acebron A., Bolamperti A., Comastri A., Gilli R., Caputi K.I., Ricotti M., Gruppioni C., Ravindranath S., Mercurio A., Strait V., Martis N., Pascale R., Caminha G.B., Annunziatella M., Nonino M. "An extremely metal-poor star complex in the reionization era: Approaching Population III stars with JWST" Astronomy and Astrophysics, 678, art. no. A173

Vargas-González J., Forbrich J., Rivilla V.M., Menten K.M., Güdel M., Hacar A. "A systematic survey of millimetre-wavelength flaring variability of young stellar objects in the Orion Nebula Cluster" Monthly Notices of the Royal Astronomical Society, 522 (1), pp. 56 – 69

Vaughan A., Minitti M.E., Cardarelli E.L., Johnson J.R., Kah L.C., Pilleri P., Rice M.S., Sephton M., Horgan B.H.N., Wiens R.C., Yingst R.A., Zorzano Mier M.-P., Anderson R., Bell J.F., III, Brown A.J., Cloutis E.A., Cousin A., Herkenhoff K.E., Hausrath E.M., Hayes A.G., Kinch K., Merusi M., "Regolith of the Crater Floor Units, Jezero Crater, Mars: Textures, Composition, and Implications for Provenance" Journal of Geophysical Research: Planets, 128 (3), art. no. e2022JE007437

Velilla-Prieto L., Fonfría J.P., Agúndez M., Castro-Carrizo A., Guélin M., Quintana-Lacaci G., Cherchneff I., Joblin C., McCarthy M.C., Martín-Gago J.A., Cernicharo J. "Atmospheric molecular blobs shape up circumstellar envelopes of AGB stars" Nature, 617 (7962), pp. 696 – 700

Vicente-Retortillo A., Martínez G.M., Lemmon M.T., Hueso R., Johnson J.R., Sullivan R., Newman C.E., Sebastián E., Toledo D., Apéstigue V., Arruego I., Munguira A., Sánchez-Lavega A., Murdoch N., Gillier M., Stott A., Mora-Sotomayor L., Bertrand T., Tamppari L.K., Juárez M.D.L.T., Rodríguez-Manfredi J.-A. “Dust Lifting Through Surface Albedo Changes at Jezero Crater, Mars” Journal of Geophysical Research: Planets, 128 (4), art. no. e2022JE007672

Villar Martín M., Castro-Rodríguez N., Pereira Santaella M., Lamperti I., Tadhunter C., Emonts B., Colina L., Alonso Herrero A., Cabrera-Lavers A., Bellocchi E. “Limited impact of jet-induced feedback in the multi-phase nuclear interstellar medium of 4C12.50” Astronomy and Astrophysics, 673, art. no. A25

Vink J.S., Mehner A., Crowther P.A., Fullerton A., Garcia M., Martins F., Morrell N., Oskinova L.M., St-Louis N., Ud-Doula A., Sander A.A.C., Sana H., Bouret J.-C., Kubátová B., Marchant P., Martins L.P., Wofford A., Van Loon J.T., Grace Telford O., Götberg Y., Bowman D.M., Erba C., Kalari V.M., Abdul-Masih M., Alkousa T., Backs F., Barbosa C.L., Berlanas S.R., Bernini-Peron M., Bestenlehner J.M., Blomme R., Bodensteiner J., Brands S.A., Evans C.J., David-Uraz A., Driessen F.A., Dsilva K., Geen S., Gómez-González V.M.A., Grassitelli L., Hamann W.-R., Hawcroft C., Herrero A., Higgins E.R., John Hillier D., Ignace R., Istrate A.G., Kaper L., Kee N.D., Kehrig C., Keszthelyi Z., Klencki J., De Koter A., Kuiper R., Laplace E., Larkin C.J.K., Lefever R.R., Leitherer C., Lennon D.J., Mahy L., Maíz Apellániz J., Maravelias G., Marcolino W., McLeod A.F., De Mink S.E., Najarro F., Oey M.S., Parsons T.N., Pauli D., Pedersen M.G., Prinja R.K., Ramachandran V., Ramírez-Tannus M.C., Sabhahit G.N., Schootemeijer A., Reyero Serantes S., Shenar T., Stringfellow G.S., Sudnik N., Tramper F., Wang L. “X-Shooting ULLYSES: Massive stars at low metallicity: I. Project description” Astronomy and Astrophysics, 675, art. no. A154

Vioque M., Cavieres M., González M.P., Ribas I., Oudmaijer R.D., Mendigutía I., Kilian L., Cánovas H., Kuhn M.A. “Clustering Properties of Intermediate and High-mass Young Stellar Objects” Astronomical Journal, 166 (5), art. no. 183

Wang F., Yang J., Hennawi J.F., Fan X., Sun F., Champagne J.B., Costa T., Habouzit M., Endsley R., Li Z., Lin X., Meyer R.A., Schindler J., Wu Y., Bañados E., Barth A.J., Bhowmick A.K., Bieri R., Blecha L., Bosman S., Cai Z., Colina L., Connor T., Davies F.B., Decarli R., De Rosa G., Drake A.B., Egami E., Eilers A.-C., Evans A.E., Farina E.P., Haiman Z., Jiang L., Jin X., Jun H.D., Kakiichi K., Khusanova Y., Kulkarni G., Li M., Liu W., Loiacono F., Lupi A., Mazzucchelli C., Onoue M., Pudoka M.A., Rojas-Ruiz S., Shen Y., Strauss M.A., Tee W.L., Trakhtenbrot B., Trebitsch M., Venemans B., Volonteri M., Walter F., Xie Z.-L., Yue M., Zhang H., Zhang H., Zou S. “A SPectroscopic Survey of Biased Halos in the Reionization Era (ASPIRE): JWST Reveals a Filamentary Structure around a z = 6.61 Quasar” Astrophysical Journal Letters, 951 (1), art. no. L4

Wang W., Wylezalek D., Vernet J., De Breuck C., Gullberg B., Swinbank M., Martín M.V., Lehnert M.D., Drouart G., Battaia F.A., Humphrey A., Noirot G., Kolwa S., Seymour N., Lagos P.

"3D tomography of the giant Lyα nebulae of z ≈ 3-5 radio-loud AGN" Astronomy and Astrophysics, 680, art. no. A70

Warren-Rhodes K., Cabrol N.A., Phillips M., Tebes-Cayo C., Kalaitzis F., Ayma D., Demergasso C., Chong-Diaz G., Lee K., Hinman N., Rhodes K.L., Boyle L.N., Bishop J.L., Hofmann M.H., Hutchinson N., Javiera C., Moersch J., Mondro C., Nofke N., Parro V., Rodriguez C., Sobron P., Sarazzin P., Wettergreen D., Zacny K. "Orbit-to-ground framework to decode and predict biosignature patterns in terrestrial analogues" Nature Astronomy, 7 (4), pp. 406 – 422

Watters W.A., Loeb A., Laukien F., Cloete R., Delacroix A., Dobroshinsky S., Horvath B., Kelderman E., Little S., Masson E., Mead A., Randall M., Schultz F., Szenher M., Vervelidou F., White A., Ahlstrom A., Cleland C., Dockal S., Donahue N., Elowitz M., Ezell C., Gersznowicz A., Gold N., Hercz M.G., Keto E., Knuth K.H., Lux A., Melnick G.J., Moro-Martín A., Martin-Torres J., Ribes D.L., Sail P., Teodorani M., Tedesco J.J., Tedesco G.T., Tu M., Zorzano M.-P. "The Scientific Investigation of Unidentified Aerial Phenomena (UAP) Using Multimodal Ground-Based Observatories" Journal of Astronomical Instrumentation, 12 (1), art. no. 2340006

Weingrill K., Mints A., Castañeda J., Kostrzewa-Rutkowska Z., Davidson M., De Angeli F., Hernández J., Torra F., Ramos-Lerate M., Babusiaux C., Biermann M., Crowley C., Evans D.W., Lindegren L., Martín-Fleitas J.M., Palaversa L., Ruz Mieres D., Tisanić K., Brown A.G.A., Vallenari A., Prusti T., De Bruijne J.H.J., Arenou F., Barbier A., Creevey O.L., Ducourant C., Eyer L., Guerra R., Hutton A., Jordi C., Klioner S.A., Lammers U., Luri X., Mignard F., Randich S., Sartoretti P., Smiljanic R., Tanga P., Walton N.A., Bailer-Jones C.A.L., Bastian U., Cropper M., Drimmel R., Katz D., Soubiran C., Van Leeuwen F., Audard M., Bakker J., Blomme R., Fabricius C., Fouesneau M., Frémat Y., Galluccio L., Guerrier A., Masana E., Messineo R., Nicolas C., Nienartowicz K., Pailler F., Panuzzo P., Riclet F., Roux W., Seabroke G.M., Sordo R., Thévenin F., Gracia-Abril G., Portell J., Teyssier D., Altmann M., Benson K., Berthier J., Burgess P.W., Busonero D., Busso G., Cánovas H., Carry B., Cheek N., Clementini G., Damerdji Y., De Teodoro P., Delchambre L., Dell'oro A., Fraile Garcia E., Garabato D., García-Lario P., Garralda Torres N., Gavras P., Haigron R., Hambly N.C., Harrison D.L., Hatzidimitriou D., Hodgkin S.T., Holl B., Jamal S., Jordan S., Krone-Martins A., Lanzafame A.C., Löffler W., Lorca A., Marchal O., Marrese P.M., Moitinho A., Muinonen K., Nuñez Campos M., Oreshina-Slezak I., Osborne P., Pancino E., Pauwels T., Recio-Blanco A., Riello M., Rimoldini L., Robin A.C., Roegiers T., Sarro L.M., Schultheis M., Siopis C., Smith M., Sozzetti A., Utrilla E., Van Leeuwen M., Abbas U., Ábrahám P., Abreu Aramburu A., Aerts C., Altavilla G., Álvarez M.A., Alves J., Anders F., Anderson R.I., Antoja T., Baines D., Baker S.G., Balog Z., Barache C., Barbato D., Barros M., Barstow M.A., Bartolomé S., Bashi D., Bauchet N., Baudeau N., Becciani U., Bedin L.R., Bellas-Velidis I., Bellazzini M., Beordo W., Berihuete A., Bernet M., Bertolotto C., Bertone S., Bianchi L., Binnenfeld A., Blazere A., Boch T., Bombrun A., Bouquillon S., Bragaglia A., Braine J., Bramante L., Breedt E., Bressan A., Brouillet N., Brugaletta E., Bucciarelli B., Butkevich A.G., Buzzi R., Caffau E., Cancelliere R., Cannizzo S., Cantat-Gaudin T., Carballo R., Carlucci T., Carnerero M.I., Carrasco J.M., Carretero J., Carton S., Casamiquela L., Castellani M., Castro-Ginard A., Cesare V., Charlot P., Chemin L., Chiaramida V., Chiavassa A., Chornay N., Collins R., Contursi G., Cooper W.J., Cornez T., Crosta M., Dafonte C., De Laverny P., De Luise F., De March R., De Souza R., De Torres A., Del Peloso E.F., Delbo M., Delgado A., Dharmawardena T.E., Diakite S., Diener C., Distefano E., Dolding C., Dsilva K., Durán

J., Enke H., Esquej P., Fabre C., Fabrizio M., Faigler S., Fatović M., Fedorets G., Fernández-Hernández J., Fernique P., Figueras F., Fournier Y., Fouron C., Gai M., Galinier M., Garcia-Gutierrez A., García-Torres M., Garofalo A., Gerlach E., Geyer R., Giacobbe P., Gilmore G., Girona S., Giuffrida G., Gomel R., Gomez A., González-Núñez J., González-Santamaría I., Gosset E., Granvik M., Gregori Barrera V., Gutiérrez-Sánchez R., Haywood M., Helmer A., Helmi A., Henares K., Hidalgo S.L., Hilger T., Hobbs D., Hottier C., Huckle H.E., Jabłońska M., Jansen F., Jiménez-Arranz Ó., Juaristi Campillo J., Khanna S., Kordopatis G., Kóspál Á., Kun M., Lambert S., Lanza A.F., Le Campion J.-F., Lebreton Y., Lebzelter T., Leccia S., Lecoeur-Taibi I., Lecoutre G., Liao S., Liberato L., Licata E., Lindstrøm H.E.P., Lister T.A., Livanou E., Lobel A., Loup C., Mahy L., Mann R.G., Manteiga M., Marchant J.M., Marconi M., Marín Pina D., Marinoni S., Marshall D.J., Martín Lozano J., Marton G., Mary N., Masip A., Massari D., Mastrobuono-Battisti A., Mazeh T., McMillan P.J., Meichsner J., Messina S., Michalik D., Millar N.R., Molina D., Molinaro R., Molnár L., Monari G., Monguió M., Montegriffo P., Montero A., Mor R., Mora A., Morbidelli R., Morel T., Morris D., Mowlavi N., Munoz D., Muraveva T., Murphy C.P., Musella I., Nagy Z., Nieto S., Noval L., Ogden A., Ordenovic C., Pagani C., Pagano I., Palicio P.A., Pallas-Quintela L., Panahi A., Panem C., Payne-Wardenaar S., Pegoraro L., Penttilä A., Pesciullesi P., Piersimoni A.M., Pinamonti M., Pineau F.-X., Plachy E., Plum G., Poggio E., Pourbaix D., Prša A., Pulone L., Racero E., Rainer M., Raiteri C.M., Ramos P., Ratajczak M., Re Fiorentin P., Regibo S., Reylé C., Ripepi V., Riva A., Rix H.-W., Rixon G., Robichon N., Robin C., Romero-Gómez M., Rowell N., Royer F., Rybicki K.A., Sadowski G., Sáez Núñez A., Sagristà Sellés A., Sahlmann J., Sanchez Gimenez V., Sanna N., Santoveña R., Sarasso M., Sarrate Riera C., Sciacca E., Segovia J.C., Ségransan D., Shahaf S., Siebert A., Siltala L., Slezak E., Smart R.L., Snaith O.N., Solano E., Solitro F., Souami D., Souchay J., Spina L., Spitoni E., Spoto F., Squillante L.A., Steele I.A., Steidelmüller H., Surdej J., Szabados L., Taris F., Taylor M.B., Teixeira R., Tolomei L., Torralba Elipe G., Trabucchi M., Tsantaki M., Ulla A., Unger N., Vanel O., Vecchiato A., Vicente D., Voutsinas S., Weiler M., Wyrzykowski Ł., Zhao H., Zorec J., Zwitter T., Balaguer-Núñez L., Leclerc N., Morgenthaler S., Robert G., Zucker S. "Gaia Focused Product Release: Sources from Service Interface Function image analysis: Half a million new sources in omega Centauri" Astronomy and Astrophysics, 680, art. no. A35

Westall F., Brack A., Fairén A.G., Schulte M.D. "Setting the geological scene for the origin of life and continuing open questions about its emergence" Frontiers in Astronomy and Space Sciences, 9, art. no. 1095701

Wilkins S.M., Lovell C.C., Vijayan A.P., Irodotou D., Adams N.J., Roper W.J., Caruana J., Matthee J., Seeyave L.T.C., Conselice C.J., Pérez-González P.G., Turner J.C., Donnellan J.M.S., Verma A., Trussler J.A.A. "First light and reionization epoch simulations (FLARES) XI: [O III] emitting galaxies at $5 < z < 10$" Monthly Notices of the Royal Astronomical Society, 522 (3), pp. 4014 – 4027

Witstok J., Shivaei I., Smit R., Maiolino R., Carniani S., Curtis-Lake E., Ferruit P., Arribas S., Bunker A.J., Cameron A.J., Charlot S., Chevallard J., Curti M., de Graaff A., D'Eugenio F., Giardino G., Looser T.J., Rawle T., Rodríguez del Pino B., Willott C., Alberts S., Baker W.M., Boyett K., Egami E., Eisenstein D.J., Endsley R., Hainline K.N., Ji Z., Johnson B.D., Kumari N., Lyu J., Nelson E., Perna M., Rieke M., Robertson B.E., Sandles L., Saxena A., Scholtz J., Sun F., Tacchella S., Williams C.C., Willmer C.N.A. “Carbonaceous dust grains seen in the first billion years of cosmic time” Nature, 621 (7978), pp. 267 – 270

Wright G.S., Rieke G.H., Glasse A., Ressler M., García Marín M., Aguilar J., Alberts S., Álvarez-Márquez J., Argyriou I., Banks K., Baudoz P., Boccaletti A., Bouchet P., Bouwman J., Brandl B.R., Breda D., Bright S., Cale S., Colina L., Cossou C., Coulais A., Cracraft M., De Meester W., Dicken D., Engesser M., Etxaluze M., Fox O.D., Friedman S., Fu H., Gasman D., Gáspár A., Gastaud R., Geers V., Glauser A.M., Gordon K.D., Greene T., Greve T.R., Grundy T., Güdel M., Guillard P., Haderlein P., Hashimoto R., Henning T., Hines D., Holler B., Detre I.H., Jahromi A., James B., Jones O.C., Justtanont K., Kavanagh P., Kendrew S., Klaassen P., Krause O., Labiano A., Lagage P.-O., Lambros S., Larson K., Law D., Lee D., Libralato M., Alverez J.L., Meixner M., Morrison J., Mueller M., Murray K., Mycroft M., Myers R., Nayak O., Naylor B., Nickson B., Noriega-Crespo A., Östlin G., O’Sullivan B., Ottens R., Patapis P., Penanen K., Pietraszkiewicz M., Ray T., Regan M., Roteliuk A., Royer P., Samara-Ratna P., Samuelson B., Sargent B.A., Scheithauer S., Schneider A., Schreiber J., Shaughnessy B., Sheehan E., Shivaei I., Sloan G.C., Tamas L., Teague K., Temim T., Tikkanen T., Tustain S., van Dishoeck E.F., Vandenbussche B., Weilert M., Whitehouse P., Wolff S. “The Mid-infrared Instrument for JWST and Its In-flight Performance” Publications of the Astronomical Society of the Pacific, 135 (1046), art. no. 048003

Yang G., Caputi K.I., Papovich C., Arrabal Haro P., Bagley M.B., Behroozi P., Bell E.F., Bisigello L., Buat V., Burgarella D., Cheng Y., Cleri N.J., Davé R., Dickinson M., Elbaz D., Ferguson H.C., Finkelstein S.L., Grogin N.A., Hathi N.P., Hirschmann M., Holwerda B.W., Huertas-Company M., Hutchison T.A., Iani E., Kartaltepe J.S., Kirkpatrick A., Kocevski D.D., Koekemoer A.M., Kokorev V., Larson R.L., Lucas R.A., Pérez-González P.G., Rinaldi P., Shen L., Trump J.R., De La Vega A., Yung L.Y.A., Zavala J.A. “CEERS Key Paper. VI. JWST/MIRI Uncovers a Large Population of Obscured AGN at High Redshifts” Astrophysical Journal Letters, 950 (1), art. no. L5

Yang G., Papovich C., Bagley M.B., Ferguson H.C., Finkelstein S.L., Koekemoer A.M., Pérez-González P.G., Arrabal Haro P., Bisigello L., Caputi K.I., Cheng Y., Costantin L., Dickinson M., Fontana A., Gardner J.P., Grazian A., Grogin N.A., Harish S., Holwerda B.W., Iani E., Kartaltepe J.S., Kewley L.J., Kirkpatrick A., Kocevski D.D., Kokorev V., Lotz J.M., Lucas R.A., Navarro-Carrera R., Pentericci L., Pirzkal N., Ravindranath S., Rinaldi P., Shen L., Somerville R.S., Trump J.R., de la Vega A., Wilkins S.M., Yung L. Y A. “CEERS MIRI Imaging: Data Reduction and Quality Assessment” Astrophysical Journal Letters, 956 (1), art. no. L12

Yang J., Wang F., Fan X., Hennawi J.F., Barth A.J., Bañados E., Sun F., Liu W., Cai Z., Jiang L., Li Z., Onoue M., Schindler J.-T., Shen Y., Wu Y., Bhowmick A.K., Bieri R., Blecha L., Bosman S., Champagne J.B., Colina L., Connor T., Costa T., Davies F.B., Decarli R., De Rosa G., Drake A.B., Egami E., Eilers A.-C., Evans A.E., Farina E.P., Habouzit M., Haiman Z., Jin X., Jun H.D., Kakiichi K., Khusanova Y., Kulkarni G., Loiacono F., Lupi A., Mazzucchelli C., Pan Z., Rojas-Ruiz S., Strauss M.A., Tee W.L., Trakhtenbrot B., Trebitsch M., Venemans B., Vestergaard M., Volonteri M., Walter F., Xie Z.-L., Yue M., Zhang H., Zhang H., Zou S. “A SPectroscopic Survey of Biased

Halos in the Reionization Era (ASPIRE): A First Look at the Rest-frame Optical Spectra of z > 6.5 Quasars Using JWST” Astrophysical Journal Letters, 951 (1), art. no. acc9c8

Yuan H.-B., Yang L., Cruz P., Jiménez-Esteban F., Daflon S., Placco V.M., Akras S., Alfaro E.J., Galarza C.A., Gonçalves D.R., Duan F.-Q., Liu J.-F., Laur J., Solano E., Fernandes M.B., Cenarro A.J., Marín-Franch A., Varela J., Ederoclite A., López-Sanjuan C., Abramo R., Alcaniz J., Benítez N., Bonoli S., Cristóbal-Hornillos D., Dupke R.A., Hernán-Caballero A., de Oliveira C.M., Moles M., Sodré L., Jr., Ramió H.V., Taylor K. “The miniJPAS survey: stellar atmospheric parameters from 56 optical filters” Monthly Notices of the Royal Astronomical Society, 518 (2), pp. 2018 – 2033

Zakhozhay O.V., Osorio M.R.Z., Béjar V.J.S., Climent J.B., Guirado J.C., Gauza B., Lodieu N., Semenov D.A., Perez-Torres M., Azulay R., Rebolo R., Martín-Pintado J., Lefèvre C. “New constraints on the presence of debris disks around G 196-3 B and VHS J125601.92-125723.9 b” Astronomy and Astrophysics, 674, art. no. A66

Zappacosta L., Piconcelli E., Fiore F., Saccheo I., Valiante R., Vignali C., Vito F., Volonteri M., Bischetti M., Comastri A., Done C., Elvis M., Giallongo E., La Franca F., Lanzuisi G., Laurenti M., Miniutti G., Bongiorno A., Brusa M., Civano F., Carniani S., D'Odorico V., Feruglio C., Gallerani S., Gilli R., Grazian A., Guainazzi M., Marinucci A., Menci N., Middei R., Nicastro F., Puccetti S., Tombesi F., Tortosa A., Testa V., Vietri G., Cristiani S., Haardt F., Maiolino R., Schneider R., Tripodi R., Vallini L., Vanzella E. “HYPerluminous quasars at the Epoch of ReionizatION (HYPERION): A new regime for the X-ray nuclear properties of the first quasars” Astronomy and Astrophysics, 678, art. no. A201

Zavala J.A., Buat V., Casey C.M., Finkelstein S.L., Burgarella D., Bagley M.B., Ciesla L., Daddi E., Dickinson M., Ferguson H.C., Franco M., Jiménez-Andrade E.F., Kartaltepe J.S., Koekemoer A.M., Bail A.L., Murphy E.J., Papovich C., Tacchella S., Wilkins S.M., Aretxaga I., Behroozi P., Champagne J.B., Fontana A., Giavalisco M., Grazian A., Grogin N.A., Kewley L.J., Kocevski D.D., Kirkpatrick A., Lotz J.M., Pentericci L., Pérez-González P.G., Pirzkal N., Ravindranath S., Somerville R.S., Trump J.R., Yang G., Aaron Yung L.Y., Almaini O., Amorín R.O., Annunziatella M., Haro P.A., Backhaus B.E., Barro G., Bell E.F., Bhatawdekar R., Bisigello L., Buitrago F., Calabrò A., Castellano M., Chávez Ortiz I.A., Chworowsky K., Cleri N.J., Cohen S.H., Cole J.W., Cooke K.C., Cooper M.C., Cooray A.R., Costantin L., Cox I.G., Croton D., Davé R., Vega A.D.L., Dekel A., Elbaz D., Estrada-Carpenter V., Fernández V., Finkelstein K.D., Freundlich J., Fujimoto S., García-Argumánez I., Gardner J.P., Gawiser E., Gómez-Guijarro C., Guo Y., Hamilton T.S., Hathi N.P., Holwerda B.W., Hirschmann M., Huertas-Company M., Hutchison T.A., Iyer K.G., Jaskot A.E., Jha S.W., Jogee S., Juneau S., Jung I., Kassin S.A., Kurczynski P., Larson R.L., Leung G.C.K., Long A.S., Lucas R.A., Magnelli B., Mantha K.B., Matharu J., McGrath E.J., McIntosh D.H., Medrano A., Merlin E., Mobasher B., Morales A.M., Newman J.A., Nicholls D.C., Pandya V., Rafelski M., Ronayne K., Rose C., Ryan R.E., Jr., Santini P., Seillé L.-M., Shah E.A., Shen L., Simons R.C., Snyder G.F., Stanway E.R., Straughn A.N., Teplitz H.I., Vanderhoof B.N., Vega-Ferrero J., Wang W., Weiner B.J., Willmer C.N.A., Wuyts S. “Dusty Starbursts Masquerading as Ultra-high Redshift Galaxies in JWST CEERS Observations" Astrophysical Journal Letters, 943 (2), art. no. L9

Zeng S., Rivilla V.M., Jiménez-Serra I., Colzi L., Martín-Pintado J., Tercero B., de Vicente P., Martín S., Requena-Torres M.A. "Amides inventory towards the G+0.693−0.027 molecular cloud" Monthly Notices of the Royal Astronomical Society, 523 (1), pp. 1448 – 1463

Zorzano M.P., Olsson-Francis K., Doran P.T., Rettberg P., Coustenis A., Ilyin V., Raulin F., Shehhi O.A., Groen F., Grasset O., Nakamura A., Ballesteros O.P., Sinibaldi S., Suzuki Y., Kumar P., Kminek G., Hedman N., Fujimoto M., Zaitsev M., Hayes A., Peng J., Ammannito E., Mustin C., Xu K. "The COSPAR planetary protection requirements for space missions to Venus" Life Sciences in Space Research, 37, pp. 18 - 24

Books:

TITULO	ISBN	EDITORIAL	AUTOR
Cosmografía en la Antigüedad Mesopotamia y el mundo grecorromano	978-84-9091-837-1	Ministerio de Defensa	David Barrado Navascués
Cosmography in the Age of Discovery and the Scientific Revolution	978-3-031-29884-4	Springer	David Barrado Navascues
El telescopio espacial James Webb	978-84-1352-860-1	Los Libros de la Catarata	Almudena Alonso Herrero
La vida y su búsqueda más allá de la Tierra	978-84-00-11131-1	Consejo Superior de Investigaciones Científica; CATARATA, Los Libros de la	Ester Lázaro

Medios de comunicación y prensa

Descripción	Title	IP	Entidad
Multitud de notas de prensa	Identifican con el JWST la galaxia similar a la Vía Láctea más lejana jamás observada	Luca Costantin, P. Pérez González	Astrobiology Center, Universidad Complutense de Madrid, Instituto de Astrofísica de Canarias, Universidad de la Laguna, University of Padova, Universidad de Atacama
Nota de prensa con eco en diferentes medios radiofónicos/prensa digital	"A cosmic stream of atomic carbon gas connected to a massive radio galaxy at redshift 3.8"	Emonts et al. (incl. Villar Martín)	Journal Science, 379, 6639
Entrevista	Descubierta una galaxia gemela de la Vía Láctea en los confines del universo	Luca Costantin	El Pais, periodico nacional
Entrevista	Distant Milky Way-like galaxy is older than we thought possible		Magazine científica online "New Scientist"
Entrevista	James Webb Space Telescope reveals most distant Milky Way galaxy doppelganger		Magazine científica online "Space.com"
Entrevista	Descubren una galaxia gemela a la Vía Láctea		Telemadrid, Noticias TV
Entrevista	Descubierta una galaxia gemela de la Vía Láctea en el universo temprano		Programa de radio "Principio de Incertidumbre" (Canal Extremadura)
Entrevista	Il telescopio James Webb scova la più antica galassia a spirale barrata		Nature Italy
Entrevista	Il telescopio James Webb ha permesso di scoprire la più lontana galassia simile alla Via Lattea		Magazine "Il Bo Live" (University of Padova)
Participation in a Netflix docu series	Unknown: Cosmic Time Machine"	Javier Álvarez Márquez, Luca Costantin, Pablo Pérez González	netflix

Programa de radio “A golpe de bit” (Radio Exterior, RNE)	IA y el Espacio: conquistemos el mundo	Víctor M. Rivilla	Radio Exterior (RNE)
Nota de prensa	Descubrimiento del ácido carbónico en el espacio, primera molécula interestelar con 3 átomos de oxígeno	Miguel Sanz-Novo; Víctor M. Rivilla	CAB (CSIC-INTA), SINC (Ciencia contada en español)
Directo en Instagram	“Las siete artes liberales” de Giovanni dal Ponte	Monserrat Villar	Museo del Prado
Entrevista de radio	¿Cuáles son las bases científicas para hablar de ovnis y de restos biológicos no humanos?	Ester Lázaro	France 24
Entrevista de radio	Vida extraterrestre (sin ovnis ni hombrecillos verdes)		A hombros de gigantes (RNE)
Entrevista de radio	Vida más allá de la Tierra. Filosofía y ciencia en diálogo		A la luz del pensar (RNE)
Entrevista de radio	Programme “A hombros de gigantes” (regular collaboration with this programme)	Carlos Briones	Radio Nacional de España (RNE)
TV	“Océanos de otros mundos”, Programme “Objetivo Planeta”	Carlos Briones and Olga Prieto	Televisión Española (TVE) – 24 h
TV	Capítulo del Documental: Quiero ser astronauta	Jesús Manuel Sobrado Vallecillo	TVE Comando actualidad
TV	Capítulo 26 del canal SpaceX Storm		
TV	Green Moon Project		Tu Tiempo con Roberto Brasero
Management of the @obsvirtesp Twitter account	M-dwarf stars in theb294 field from the VISTA Variables in the Vía Láctea (VVV)		
Prensa digital	Mars Rovers Might Miss Signs of Alien Life, Study Suggests	Azua-Bustos	Scientific American
Prensa digital	Earth’s driest place shows why it may be harder than we thought to find signs of life on Mars		CNN
Prensa digital	Strange DNA found in the desert offers lessons in the hunt for Mars life		The Washington Post

Prensa digital	Mars rover sensors may not be sensitive enough to find signs of life		New Scientist
Video YouTube	Science for a better life	Felipe Gómez	ConSalud
Internet Entrevista	Discovering Mars		Altozano

Congresos/conferencias/charlas

Descripción	**Title**	**IP**	**Entidad**
Catálogo de conferencias científicas del CSIC dirigidas a centros educativos de la Comunidad de Madrid	*Pequeña introducción a la astronomía: Un paseo por el Universo*	Giovanni Miniutti	• IES Antonio López García, Feb 2023 • CEIP Enrique Tierno Galván, Oct 2023 • Lycée Français International Molière, Nov 2023 • IES Valmayor, Nov 2023 • CEIPSO El Cantizal, Dec 2023
Catálogo de conferencias científicas del CSIC dirigidas a centros educativos de la Comunidad de Madrid	*Agujeros Negros: Un viaje al borde del abismo*		• IES José Hierro, Feb 2023 • Biblioteca Rafael Alberti (Fuencarral-El Pardo), Oct 2023 • IES Vista Alegre, Nov 2023 • IES Ana Frank, Dec 2023
Charla	*Un paseo por el universo: del Big Bang al origen de la vida*	J. Miguel Mas Hesse	HoyoConciencia, Hoyo de Manzanares
Curso de astronomía de iniciación	*Origen y evolución del Universo: del Big Bang a la formación de la vida,*		CaixaForum, Madrid

Ciclo CSIC ¿Qué sabemos de…?	*El Universo desde el espacio*	Almudena Alonso Herrero	Casa de la Ciencia del CSIC, Valencia
Ciclo de Conferencias de la Fundación Ramón Areces	*Adentrándonos en el Universo infrarrojo con el telescopio espacial James Webb,*		Fundación Ramón Areces, Madrid
Actividades del Espacio Fundación Telefónica	*Descubriendo Galaxias: Encuentro con Almudena Alonso Herrero,*		Feria del libro de Granada
Área de Ciencias, Instituto de Astrofísica de Andalucía	*Descubriendo Galaxias*		Feria del libro de Granada
Charla	*Las galaxias: qué son y cómo se clasifican,*		Colegio Público Lepanto, Madrid
Curso de astronomía de iniciación	*El telescopio espacial James Webb: galaxias y agujeros negros supermasivos,*		CosmoCaixa, Barcelona
Ciclo CSIC ¿Qué sabemos de…?	*Las galaxias antes de que fueran galaxias,*		Tabakalera, San Sebastián
Ciclo de conferencias	*Los primeros resultados del telescopio espacial James Webb,*		Agrupación Astronómica de Madrid, Madrid
Taller del Programa Dinamizadores de la Fundación Margaritas Salas	*El telescopio espacial James Webb,*		Biblioteca pública de San Blas, Madrid
Pint of Science	*La revolución del telescopio espacial James Webb*	Luca Costantin	European outreach event
European Researchers' Night, Madrid, Spain	*Descubriendo el Universo lejano con el telescopio espacial Webb*		
Semana de la Ciencia	*Los limites del Universo: la revolución del telescopio espacial Webb*		Ministerio de Ciencia, Innovación y Universidades y Consejo Superior de Investigaciones Científicas
"INTA Experience" encuentro con estudiantes de	*La carrera investigadora y los mayores retos astrofisícos*		INTA

licenciatura, Madrid			
IX Fórum de Ciudades y Territorios Creativos de España. Bailando con las Estrellas.	*Cultural gathering "Encuentros de Arte, Ciencia y Saberes Tradicionales* Con Nacho Duato, choreographer and dancer, Modesto Lomba, fashion designer and Santiago Guerra, archaeologist	Montserrat Villar	Junta de Extremadura y Ministerio de Cultura y Deporte
Curso "Divulgar la Ciencia en el siglo XXI"	*Ilustrar los cielos, interpretar el cosmos.*		Universidad de Alicante
Curso "Cinco siglos midiendo el universo"	*Reflejos del Cosmos en el Museo del Prado*		Universidad de Valencia
Anexo de libro	*Universos del conocimiento. Libros para pensar, libros para observar, libros para soñar*		Universidad complutense de Madrid
Ciclo de conferencias "La lógica de la belleza"	*The beauty of the universe*		Cosmocaixa, Barcelona Cosmocaixa (Palma de Mallorca) (Caixaforum, Madrid)
Semana de la Ciencia	*A hombros de gigantes*		Radio Nacional de España (RNE)
Dialogo publico	*New worlds... and inhabited!*	Montserrat Villar and Sandra Sáenz Lopez	Biblioteca Histórica Marqués de Valdecilla (Madrid)
Catálogo de conferencias científicas del CSIC dirigidas a centros educativos de la Comunidad de Madrid	*Nuestra Dirección Cósmica*	Margherita Giustini	• IES Don Pelayo, Villalbilla, Oct 2023
Charla "Specola" astronomical tower in Padova (Italy) is illuminated with a pink light every night for one	*Cosa ti passa per la testa?*	Luca Constantin	

minute to commemorate the discovery of the galaxy ceers-2112			
			International Ultraviolet Explorer (IUE)
IV Curso CesaR para el profesorado en castellano: Los límites del universo		E. Solano	
Curso CesaR de profesores internacional ESA GTTP		E. Solano	
Participación	II Premio Javier Gorosabel de Colaboración ProAm		ESAC Open Day
Perla de ciencia	Científic@s por un día: cazando asteroides con el Observatorio Virtual		
Women promotion in STEM	Chatea con una Astrónoma 2023	P. Cruz y A. Aller	
Women promotion in STEM	Co-coordinación "Astrominas 2023	P. Cruz	
Curso	Participación en el “Curso online de formación en igualdad de género en ciencia 2023” (A. Aller)	A. Aller	
Charla	*Astrobiología*	Ester Lázaro	Ciclo de Conferencias CSIC-Aula de Cultura Solidarios
Charla	*Astrobiología: un viaje al origen de la vida en el universo*		IES Renacimiento (Madrid)
Charla	*La búsqueda de vida fuera de la Tierra*		IES Mirasierra (Madrid)
Podcast	*Ciencia para leer y escuchar*		Feria del libro de Granada
Mesa redonda	*La ciencia no basta: hay que contarla, y saber contarla*		Feria del libro de Madrid
Charla	*La vida y su búsqueda fuera de la Tierra*		Seminar “Ciencia A Banda”

Charla	*La vida y su búsqueda fuera de la Tierra*		Casa de las Ciencias de Logroño
Charla	*La vida y su búsqueda fuera de la Tierra*		Museo de la Evolución Humana de Burgos
Podcast	*La viralización*		El Café del Observatorio Social de La Caixa
Dialogo	*¿Qué pasa con Darwin?*		Ateneo de Madrid
Curso	*IX Curso de Astrofísica: Astrofísica desde el espacio (pasado, presente y futuro)*		Universidad de Verano de Teruel
Curso	*Microcredencial universitaria en Astrobiología. ¿Hay alguien ahí fuera?*		Universidad de Valencia
Exposición "Science and art"	"Vida en el universo verde" (Asesoría científica y textos)	Carlos Briones and Antonio Calleja	Real Jardín Botánico de Madrid (CSIC)
Mesa redonda	"El legado transdisciplinar de Lynn Margulis" Organizador y moderador	Carlos Briones	Universidad Complutense de Madrid
Entrevista-documental	"Joan Oró: La fórmula de la vida"		Fundación Joan Oró
Charla	"El espacio: la última frontera"	Carlos Briones and Sara García	Ateneo de Madrid
Charla	"Astrobiology: Life in our planet and beyond"	Carlos Briones and Emmanuelle Javaux	Instituto Cervantes (Bruselas, Bélgica)
Cátedra Almirante Don Juan de Borbón	*Cámaras de simulación de ambientes planetarios y astrobiología*	Eva Mateo-Marti	Universidad Complutense de Madrid
Divultación en I.E.S.	"*CAB-12: Cámaras de simulación planetaria: plataforma experimental en el laboratorio*		CSIC

	para exploración planetaria y astrobiología"		
Programa de Máster Conjunto en Biotecnología Marina	Marine Microbiome and Metagenomics	José Eduardo González-Pastor	Universidad Católica de Valencia "San Vicente Mártir"
Micromundo	MicroMundo@UCM: Ciencia Ciudadana y Aprendizaje-Servicio frente a la resistencia a antibióticos desde la comunidad educativa	Carolina González de Figueras	Universidad Complutense de Madrid
EMBO Curso Práctico	Microbial Metagenomics: a 360º Approach	José Eduardo González-Pastor	European Molecular Biology Organization (EMBO)
Charla divulgativa	"Centro de Astrobiología, ¿qué puede hacer un biólogo en un centro de investigación?	Carolina González de Figueras	Colegio Jesús María
Ciclo de Conferencias Científicas del CSIC dirigidas al sistema educativo de la comunidad de Madrid	Simulación espacial en el laboratorio. Atmósferas y simulación planetaria	Jesús Manuel Sobrado Vallecillo	IES La Cabrera
Jornadas	Orientación vocacional y profesional dirigidas a los alumnos de bachillerato		Colegio Abaco, Madrid
Profesor del curso de vacío	Lección 7: Medidores de vacío total		ASEVA
I Congreso de Innovación Educativa en Ciencias del Espacio	Ponencia "Objetivo Marte"		Principado de Asturias
Charla de divulgación	LA EXPLORACIÓN ESPACIAL		Colegio Padre Coloma
Colaboración en canal de divulgación	misiones espaciales		Fuera de Órbita

XXIX Jornadas Astronómicas del planetario de Castellón. Charla	Marte. La próxima frontera		Planetario de Castellón
Conferencia en el curso "EXPLORACIÓN DE ESPACIOS HABITABLES FUERA DE LA TIERRA"	"Estudio de atmósferas en astrobiología. Rastreando signos vida fuera en el espacio profundo"		Cursos de Verano de la Universidad Complutense de Madrid
Conferencia	La exploración humana del Sistema Solar: de la Luna a Marte		Museo de Ciencias de Cuenca
SASDABA (Project Star Analyser Spectroscopic DataBAse)	Near Earth asteroid precovery ◦ New data collections (J-PLUS) ◦ Bug fixing	Astrofisica	Spanish Virtual Observatory and the Garraf Astronomical Observatory (OAG)

- Near Earth asteroid precovery
    - New data collections (J-PLUS)
    - Bug fixing

Virtual Observatory schools go virtual.

Since 2009 the Spanish Virtual Observatory group has been actively participating in the organization of Virtual Observatory (VO) schools both at national and European level. These schools have two goals: to expose participants to VO tools and services, so they can efficiently use them for their research and to gather feedback and requirements for VO tools and services and the schools themselves from the participants.

In 2023 we organize two schools focused on master/PhD/ early-career researchers and on amateur astronomers:

- *I Escuela Latinoamericana de Observatorio Virtual*. March 2023
- J-PAS Tools School. May 2023
- II Escuela de Observatorio Virtual para amateurs. (XXIII escuela SVO) November 2023

Short visits:

- Paula Coelho (São Paulo Univ.) and Alessandro Ederoclite (CEFCA). April 2023 (5 days)

Jesús Manuel Sobrado Vallecillo. Marte en la Tierra. Revista Española de Física, Vol 37, nº4, de octubre-diciembre del 2023

Redacción de la revista divulgativa Astronomía. Sección de Astrobiología (números de Enero a Diciembre de 2023)

International Congress Committees:

European Astrobiology Network Association (EANA) 2023 in Madrid, Spain

- Eva Mateo-Martí, Centro de Astrobiología
- Víctor Parro, Centro de Astrobiología

Biennial European Astrobiology Conference (BEACON) 2023 in Fuencaliente, La Palma, Spain

- Jose Antonio Caballero, Centro de Astrobiología

12th International Conference on Complex Networks and their Applications in Menton Riviera, France

- Jacobo Aguirre, Centro de Astrobiología

Formation

XIX International Summer School of Astrobiology 'Josep Comas i Solà': Searching for Life on Ocean Worlds

Directors:

Rosaly M. Lopes - Jet Propulsion Laboratory (JPL) NASA, USA

Víctor Parro García - Centro de Astrobiología (CAB) CSIC-INTA

Spain Organization

Carlos Briones Llorente - Centro de Astrobiología (CAB) CSIC-INTA, Spain

Teachers:

Víctor Parro García - Centro de Astrobiología (CAB) CSIC-INTA

Rosaly M. Lopes - Jet Propulsion Laboratory (JPL) NASA, USA

Morgan L. Cable - Jet Propulsion Laboratory (JPL), NASA, USA

Nicolas Altobelli - European Space Agency (ESA), Madrid, Spain

Olga Prieto Ballesteros - Centro de Astrobiología (CAB) CSIC-INTA, Spain

Shannon M. MacKenzie - Johns Hopkins University Applied Physics Laboratory, Maryland, USA

The 2023 Josep Comas i Sola International Summer School in Astrobiology is scheduled to take place from July 10-14, 2023, and will be focused on the exploration of ocean worlds orbiting the giant planets of our Solar System.
Moons such as Enceladus, Europa, Ganymede, and Titan are key astrobiological targets for future exploration by both NASA and ESA missions. These moons contain global liquid water oceans underneath icy surfaces and provide a different astrobiological perspective from rocky worlds such as Mars. Recent exploration has revealed the diverse biomes in Earth's deep oceans and ice sheets and has opened up our ideas of habitability. Ocean worlds present deep potentially habitable environments dominated by the physical processes of water and ice where alien life could exist in our Solar System.

The Cassini mission revealed water vapor plumes spewing material from the interior of Enceladus, and Titan as an organic-rich world having a methane cycle similar to the hydrological cycle on Earth, with an interior ocean that is potentially habitable. Titan is the target of NASA's Dragonfly mission, which will explore the chemistry and habitability of Titan's surface using a rotorcraft. The ocean underneath Jupiter's moon Europa was revealed by the Galileo mission and, since then, evidence for water vapor plumes spewing from its interior has been mounting. Europa is the target of NASA's Europa Clipper mission and will also be studied by ESA's JUICE mission. Ganymede, the solar system's largest moon, is the main target of the JUICE mission, and is also an ocean world that may harbor conditions favorable to the emergence of life. These moons, as well as other potential ocean worlds such as Neptune's moon Triton or Uranus's moon Miranda, provide a rich subject area for the study of astrobiology and how life could have evolved in their hidden oceans.

EAI Academy 2023:

Speaker	Seminar title	Department
Dr. Christiane Helling	Virtual laboratories for understanding weather and climate regimes of extrasolar planets	IWF (Austria)
Dr. Luca Fossati	The CHEOPS mission	IWF (Austria)
Dr. Miguel Mas-Hesse	The ESA PLATO Mission	CAB (Spain)
Dr. Adrienne Kish	Life with a pinch of salt	MNHN Paris (France)
Dr. Christa Schleper	Extremely thermophilic microorganisms and the origin of life	University of Vienna (Austria)
Dr. Karen Olsson-Francis	Searching for Evidence of Life: From Earth Analogue Field Sites to Laboratory Simulations	The Open University (UK)
Dr. Theresa Lueftinger	Missions to explore exoplanets: Ariel - The ESA M4 Space Mission to Focus on the Nature Of Exoplanets	ESA/ESAC (The Netherlands)
Dr. Fuencisla Cañadas	C isotope studies and applications to Mars Sample Return	CAB (Spain)
Dr. Eva Mateo-Marti	Planetary Atmospheres and Surfaces Simulation Chamber: bringing planetary objects to the lab	CAB (Spain)
Dr. Keyron Hickmann- Lewis	Mars Sample Return and the returned sample science potential of geological samples from Jezero crater	NHM London/ESA (UK)
Dr. David Barrado	JWST and spectroscopy studies of exoplanets	CAB (Spain)
Dr. Armando Azua Bustos	On the Current limits for detecting evidences of life on Mars	Centro de Astrobiología (CAB), INTA-CSIC, Madrid Spain
Dr. Nora Noffke	Early Life on Earth Preserved in the Clastic Rock Record	Old Dominion University, Norfolk, Virginia USA
Dr. Guillermo Muñoz Caro	From C to COMs (where C = atomic carbon and COMs = Complex Organic Molecules)	Centro de Astrobiología (CAB), INTA-CSIC, Madrid Spain
Dr. Marco Moracci	Life in extreme conditions: evolution on Earth and elsewhere?	Department of Biology, University of Naples, Naples Italy