

When the MSL mission will be launched next fall, a new episode of Martian exploration will start. MSL is the most sophisticated vehicle ever sent to the red planet, with both analytical and movement capabilities ever achieved before. The quality and quantity of data that will be sent to the Earth, will be far away from those sent by Mariner 4 in the middle of the 20th century.

Thank to all the missions which have observed Mars, from orbit or at its surface, the knowledge that we have about the topography, minerals at its surface, characteristics of the atmosphere or even its subsurface, is much higher than from any other planetary object, except the Earth.

That knowledge urge us to think that Mars could have been habitable in the past, or even today in some specific areas. There are many evidences compatible with the presence today of underground water and signs in the surface from past liquid water activity. Besides, there are nutrients and energy sources similar to those that are used by the microorganisms in Earth.

During the school time, a revision of the knowledge about Mars at present day will be done: what the past missions have shown, what is expected for the future, and how these information can result in the analysis of the potential habitability of Mars.

## INFORMACIÓN GENERAL

### Santander

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Horario:  
de 9,00 a 14,00 h.  
de 16,00 a 18,00 h.  
(excepto viernes)

### Plazo de solicitud de becas

Del 25 de abril al  
27 de mayo de 2011

### Apertura de matrícula

Desde el 25 de abril de 2011  
hasta completar plazas  
(Plazas limitadas)

### A partir del 13 de junio de 2011

Palacio de la Magdalena  
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Horario:  
de 9,00 h. a 14,00 h.  
de 15,30 a 18,00 h.  
(excepto viernes)

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\* Curso acreditado por el Ministerio de Educación para profesores de enseñanzas no universitarias

# UIMP

Universidad Internacional  
Menéndez Pelayo

# 2011

Escuela

## \*INTERNATIONAL SCHOOL OF ASTROBIOLOGY «JOSEP COMAS I SOLÀ». Mars Exploration: Unveiling an Habitable Planet

Javier Gómez-Elvira  
Carl Pilcher

Transportista oficial



Código: 60ve Tarifa: A

Santander  
June 27- July 1, 2011



Sponsors

INTERNATIONAL SCHOOL OF ASTROBIOLOGY  
«JOSEP COMAS I SOLÀ». Mars  
Exploration: Unveiling an  
Habitable Planet

Directors

**Javier Gómez-Elvira**

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Centro de Astrobiología CSIC-INTA, Spain

**Carl Pilcher**

Director  
NASA Astrobiology Institute, USA

Organization

**Olga Prieto Ballesteros**

Centro de Astrobiología, CSIC-INTA, Spain

June 27- July 1, 2011

Monday 27

10:00 h. Opening

**Javier Gómez-Elvira**

**Carl Pilcher**

10:30 h. Planetary surface: formation and evolution

**Francois Poulet**

Institut d'Astrophysique Spatiale, France

12:15 h. An overview of the history of climate on Mars:

A geological perspective **James Head**

Brown University, USA

15:00 h. Earth's early biosphere informs the search for life  
on Mars

**David J. Des Marais**

NASA Ames Research Center, USA

16:15 h. Chemical environments and the nature of Mars'  
first billion years revealed from orbital mineral  
mapping

**Bethany Ehlmann**

Division of Geological and Planetary Sciences. Caltech, USA

17:15 h. PROJECT DEVELOPMENT AND ASSIGNMENT

**Olga Prieto Ballesteros**

Tuesday 28

10:00 h. Mars past climates

**Francois Forget**

Laboratoire de Meteorologie Dynamique, CNRS, France

12:00 h. The Martian surface: a planetary surface with  
very high astrobiological interests

**Francois Poulet**

15:00 h. Water on Mars: When, where, how much,  
and in what state?

**James Head**

16:15 h. Impact craters: cradles of life, frustators of life,  
or revealors of a wet subsurface?

**Bethany Ehlmann**

22:30 h. SKY OBSERVATION

Astrocantabria

Wednesday 29

10:00 h. The present day Mars climate system

**Francois Forget**

12:00 h. The Mars Exploration Rover mission: observations  
and implications

**David J. Des Marais**

15:00 h. The Antarctic Dry Valleys: Insights into  
microclimates and Mars

**James Head**

16:15 h. ROUND TABLE

19:00 h. PUBLIC LECTURE

Biomarcadores en la exploración planetaria

**Victor Parro**

Centro de Astrobiología CSIC-INTA, Spain

Thursday 30

10:00 h. Water, Rocks, and Life in Iceland and Oman:  
lessons for Mars from terrestrial alteration  
of mafic and ultramafic rocks

**Bethany Ehlmann**

12:00 h. Future Mars exploration for habitable  
environments and life

**David J. Des Marais**

14:00 h. FIELD TRIP

**Olga Prieto Ballesteros**

Friday 1

10:00 h. Future Mars exploration a programatic  
perspective

**Álvaro Giménez Cañete**

European Space Agency

12:00 h. STUDENTS PROJECTS EXPOSITION

13:00 h. SYNTHESIS, DIPLOMAS AND FAIRWELL

**Javier Gómez-Elvira**

**Carl Pilcher**