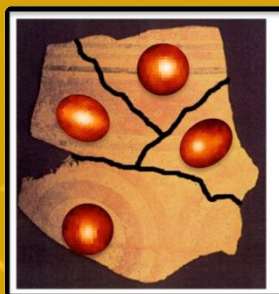
A new populations of bright massive galaxies at z>3

Belén Alcalde Pampliega

Pablo G. Pérez-González, G. Barro, H. Domínguez Sanchez ,Carmen Eliche-Moral & P. Esquej

Dpto. Física de la Tierra, Astronomía y Astrofísica II



SHARDS

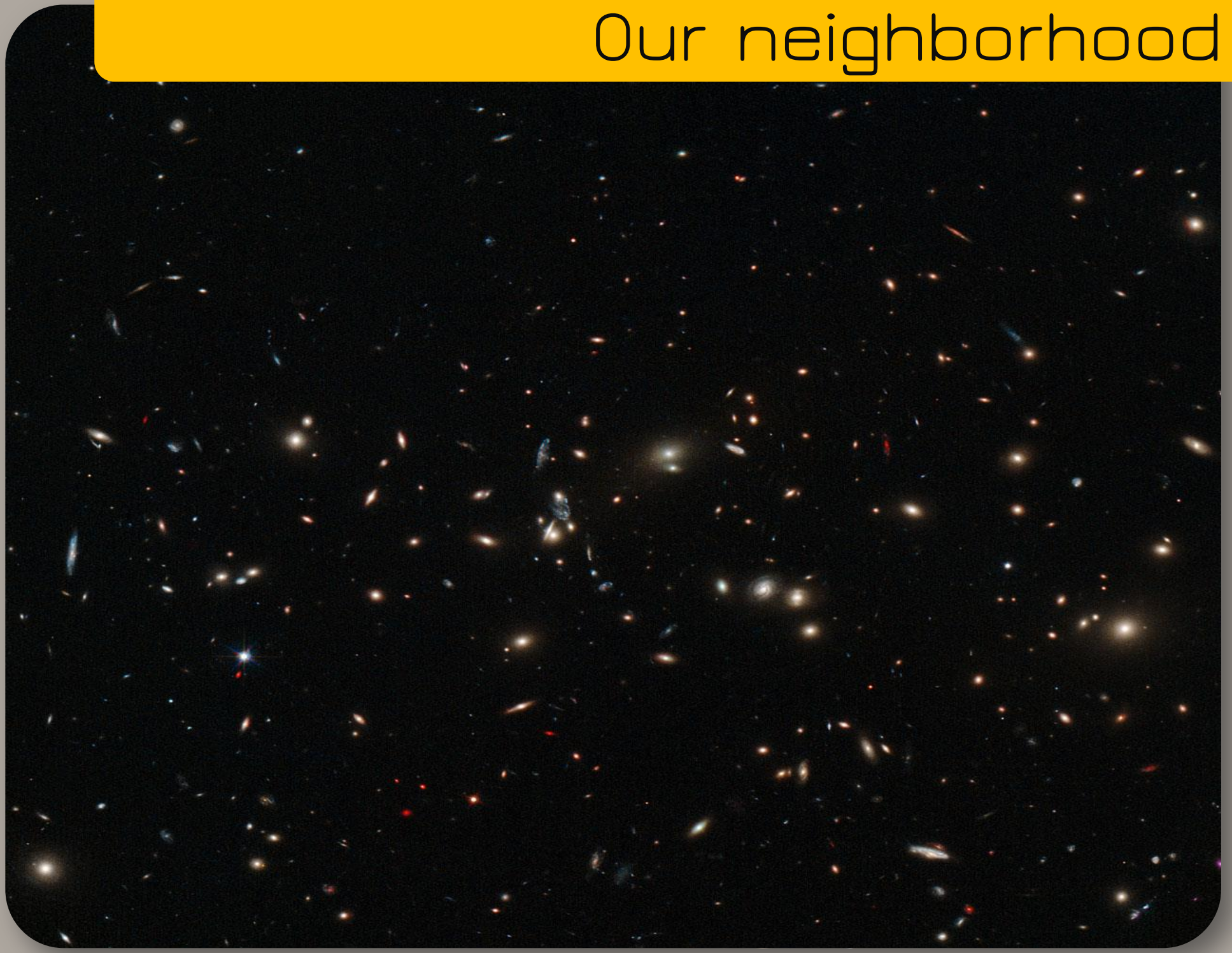
CONSOLIDER - INGENIO

GTC

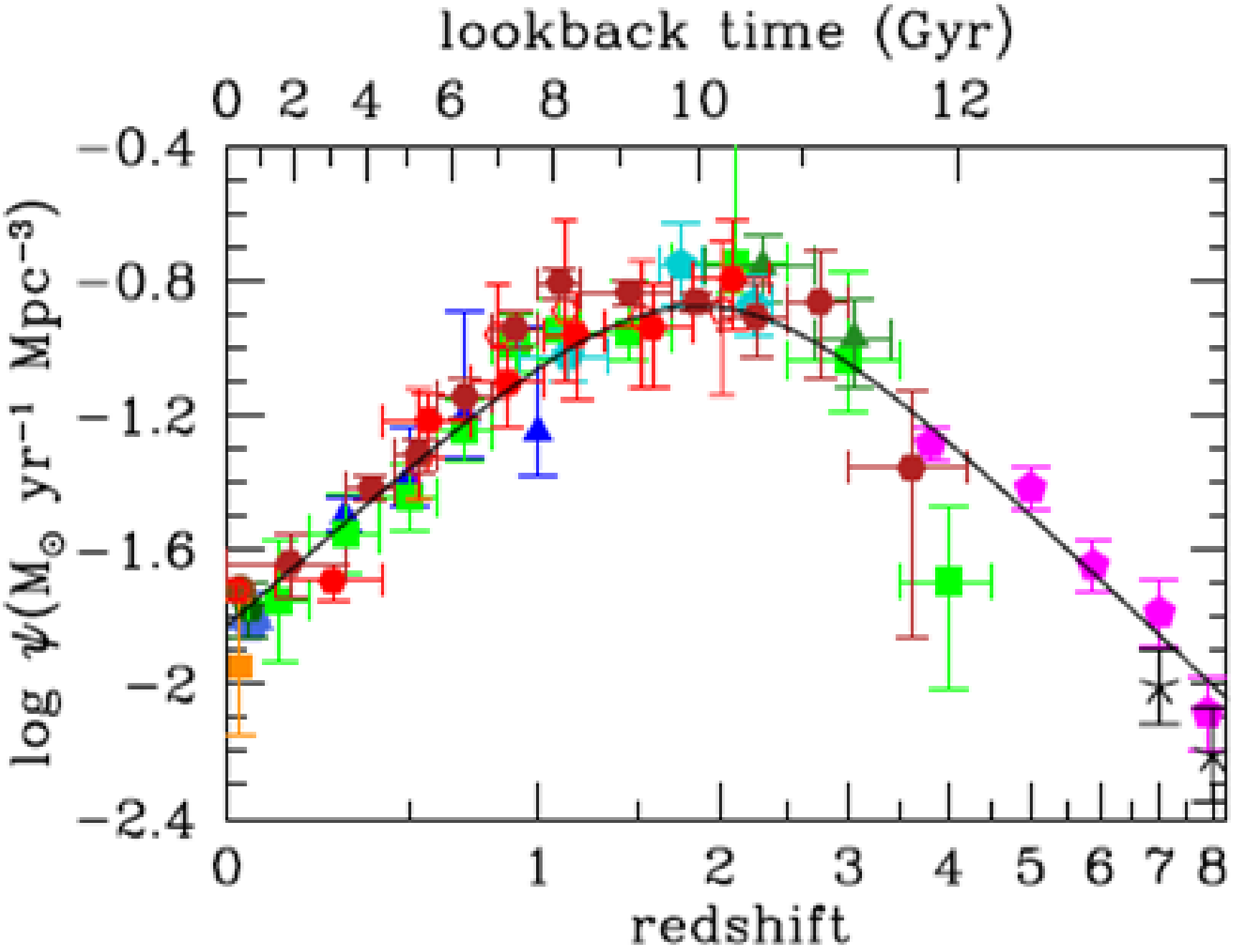
2nd SHARDS Team Meeting

May 13-14, 2015

Our neighborhood



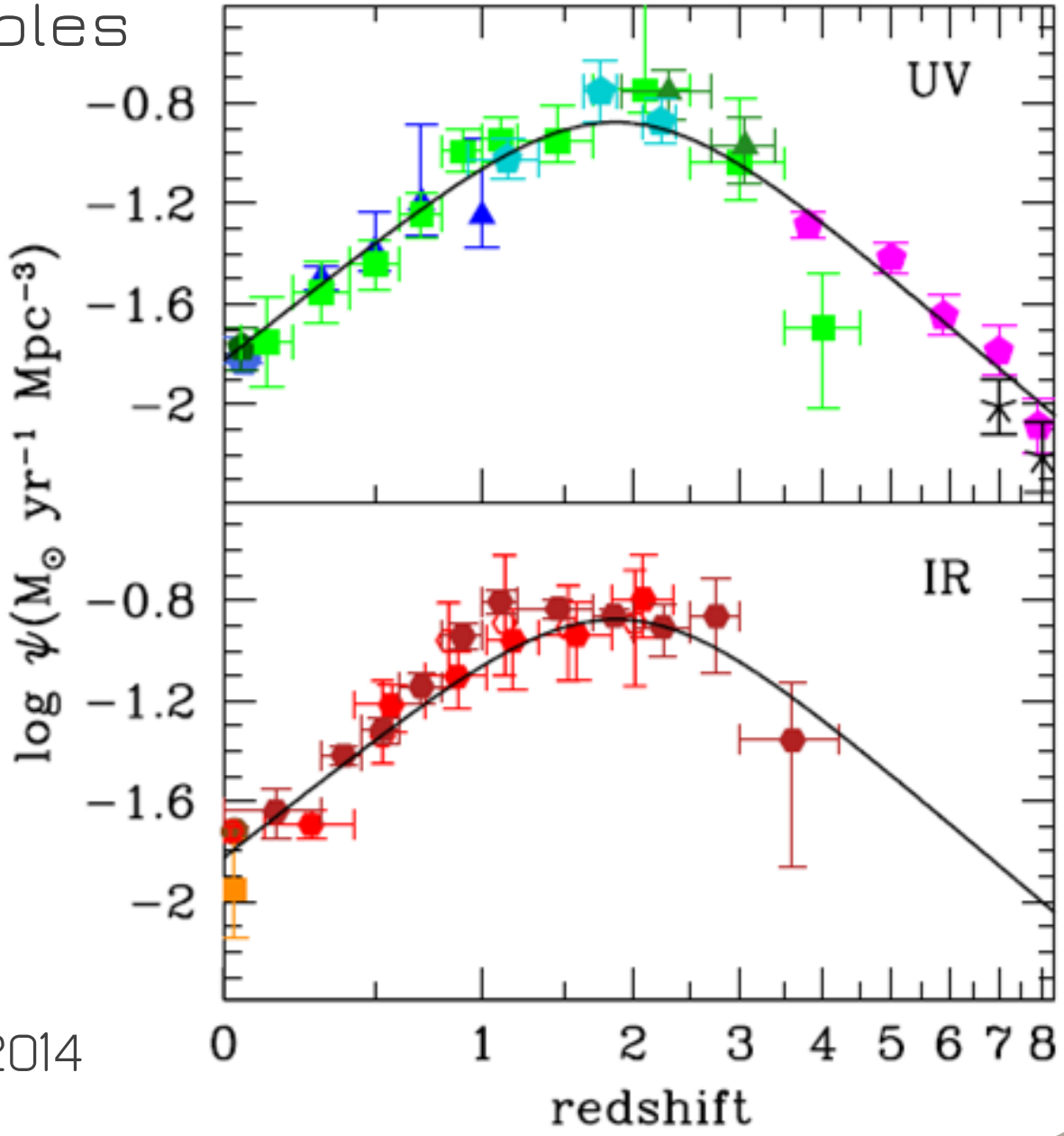
Why 3<z<6?



Madau & Dickinson 2014

Why 3<z<6?

Cosmic SFR density at z > 3 mostly based on UV-selected samples



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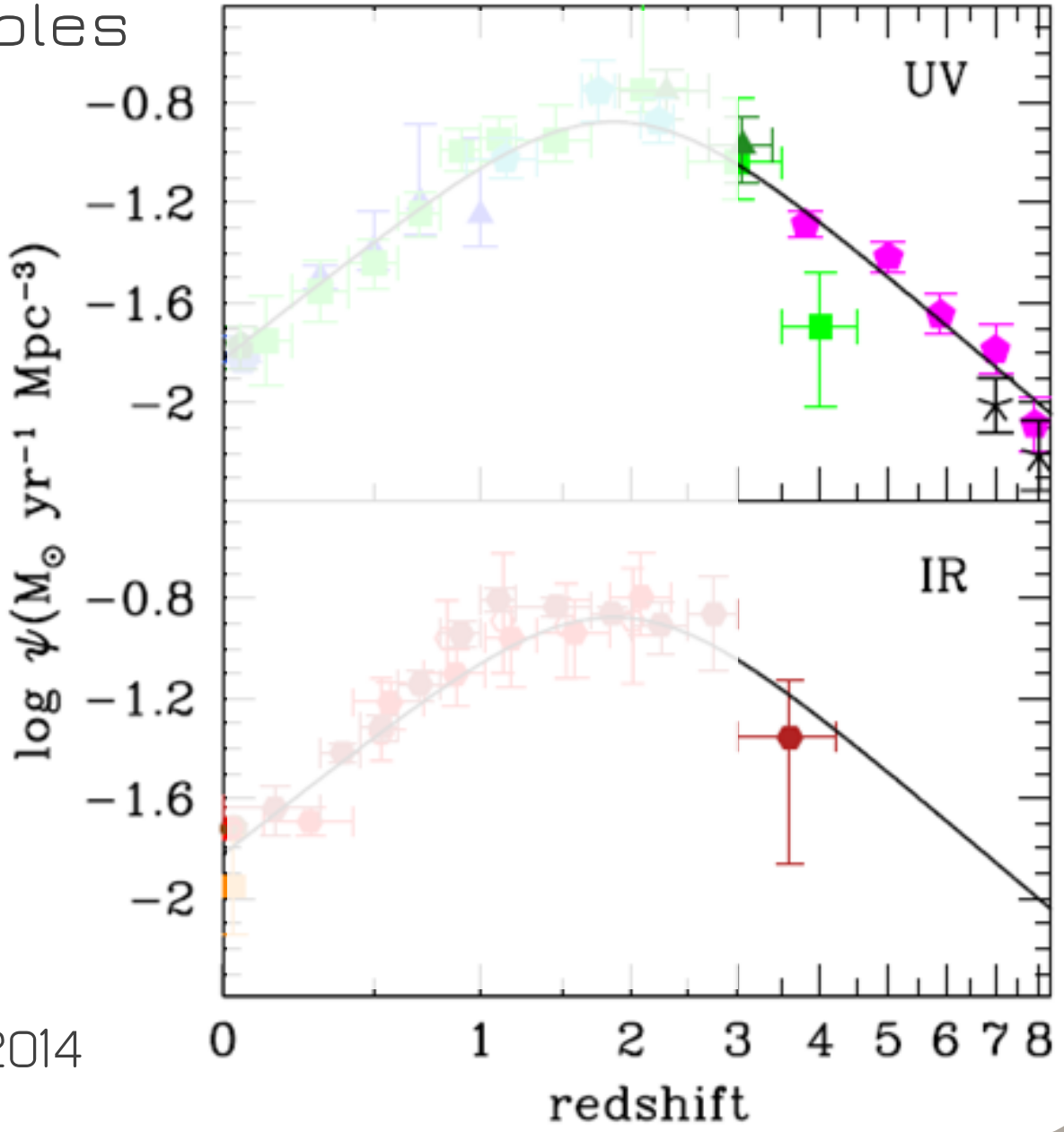
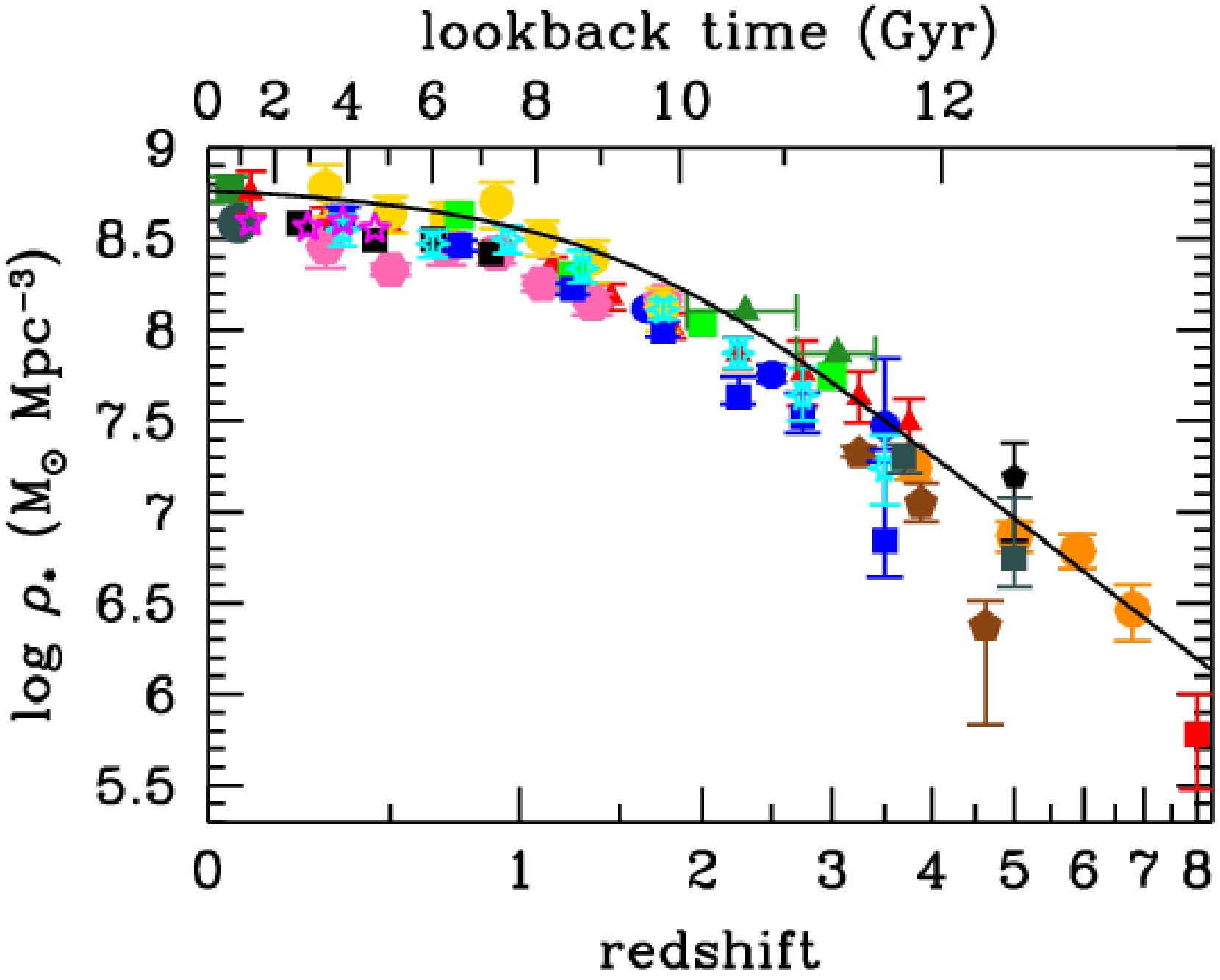


Madau & Dickinson 2014

Evolution of the Stellar Mass



Madau & Dickinson 2014

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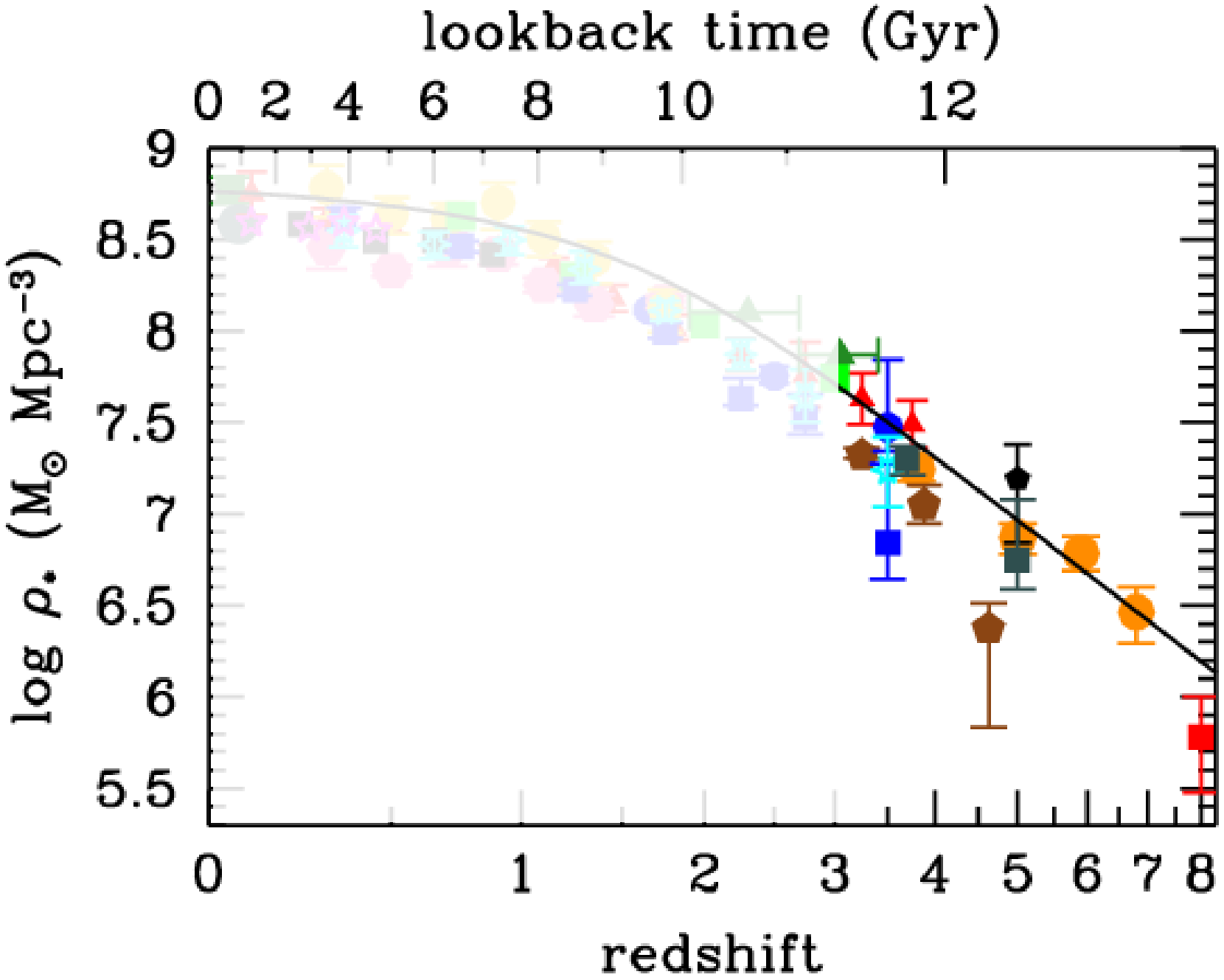


Madau & Dickinson 2014

Massive galaxies at 3<z<6

Census of galaxies at 3<z<6

Red sources (massive or dusty)

Emission-line galaxies (LAEs)

Lyman Break Galaxies (LBGs),

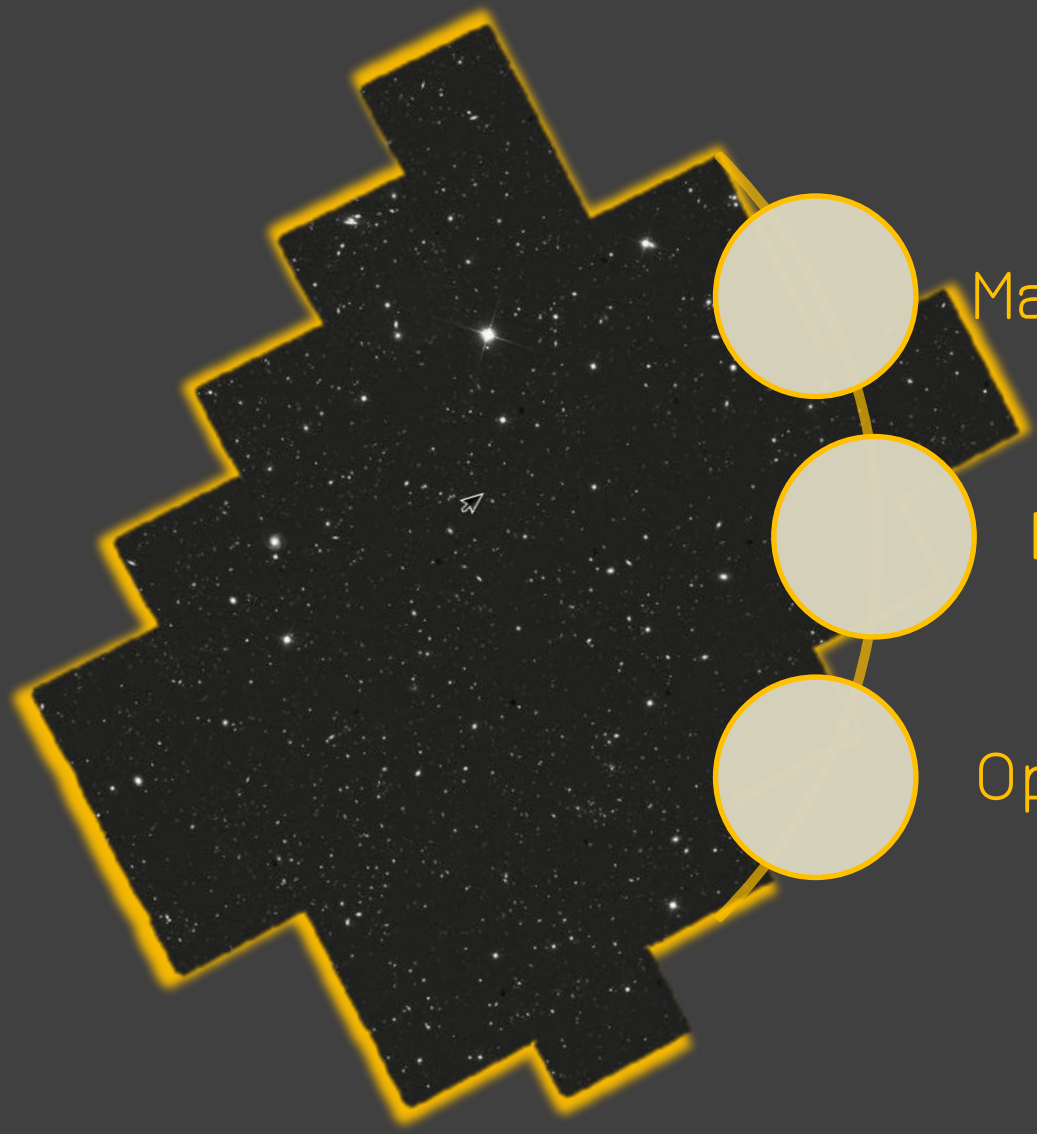
Study their physical properties?

Analysis of their stellar populations & SFH.

Understand earliest phases in the formation of galaxies.

Searching for massive galaxies

GOODS-N field



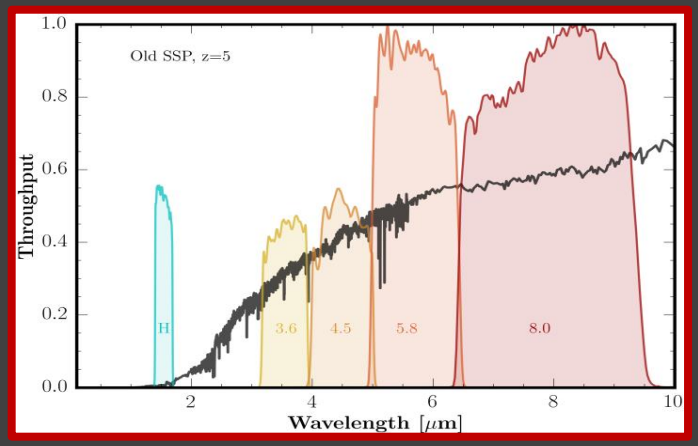
Massive galaxies z>3

Distant = faint

Optical → nearIR

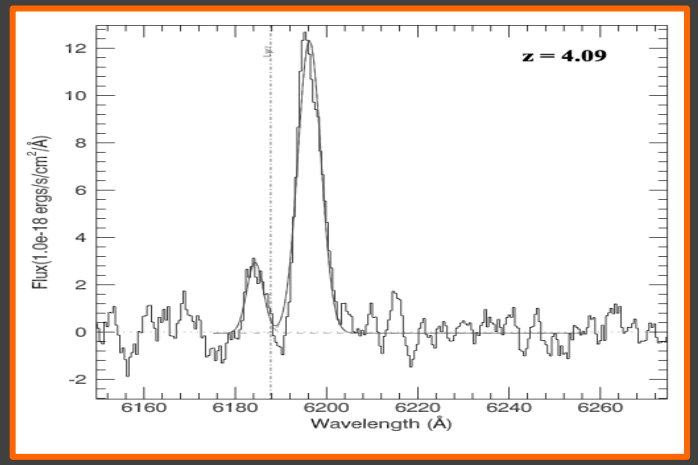
Color-selection criteria

Distant red galaxies



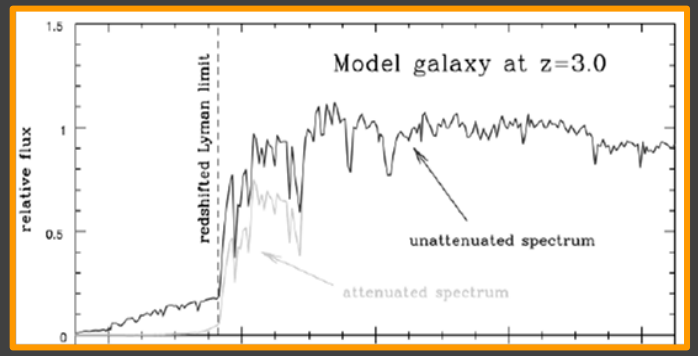
Emission line galaxies:
LAEs

Mallery et al. 2012



Lyman/Balmer breaks
dropouts

R Ellis et al 1998



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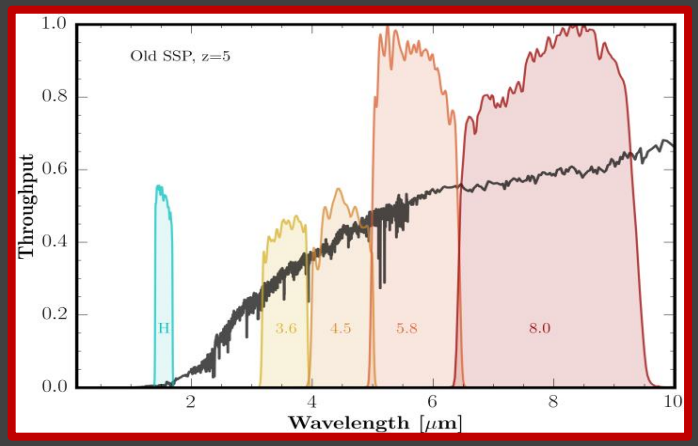

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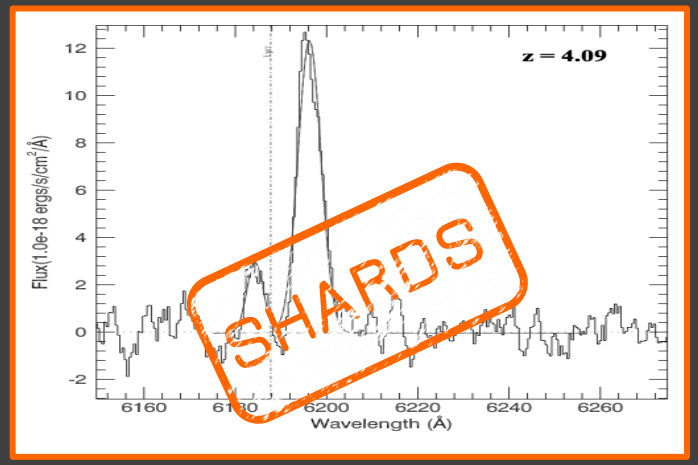

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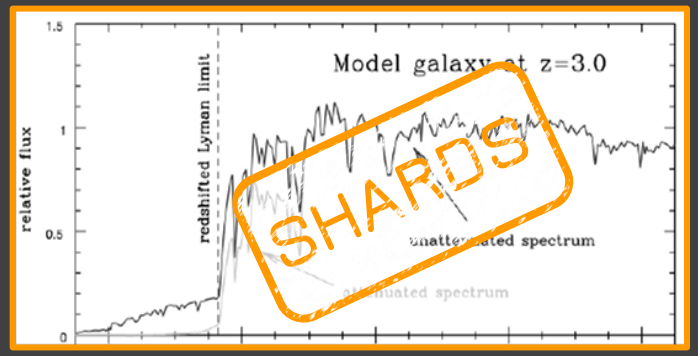


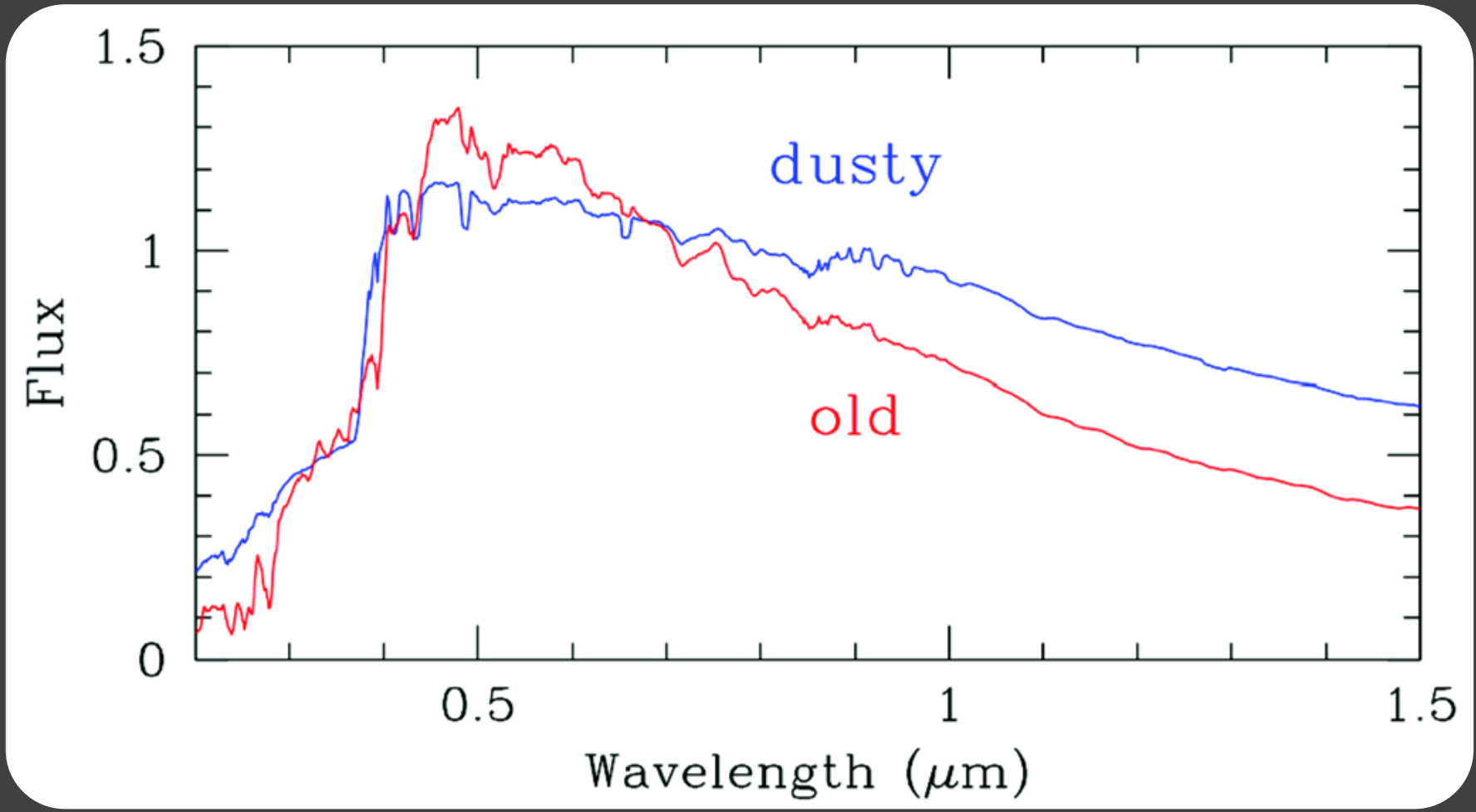
Massive Red galaxies

Red

** Dusty?

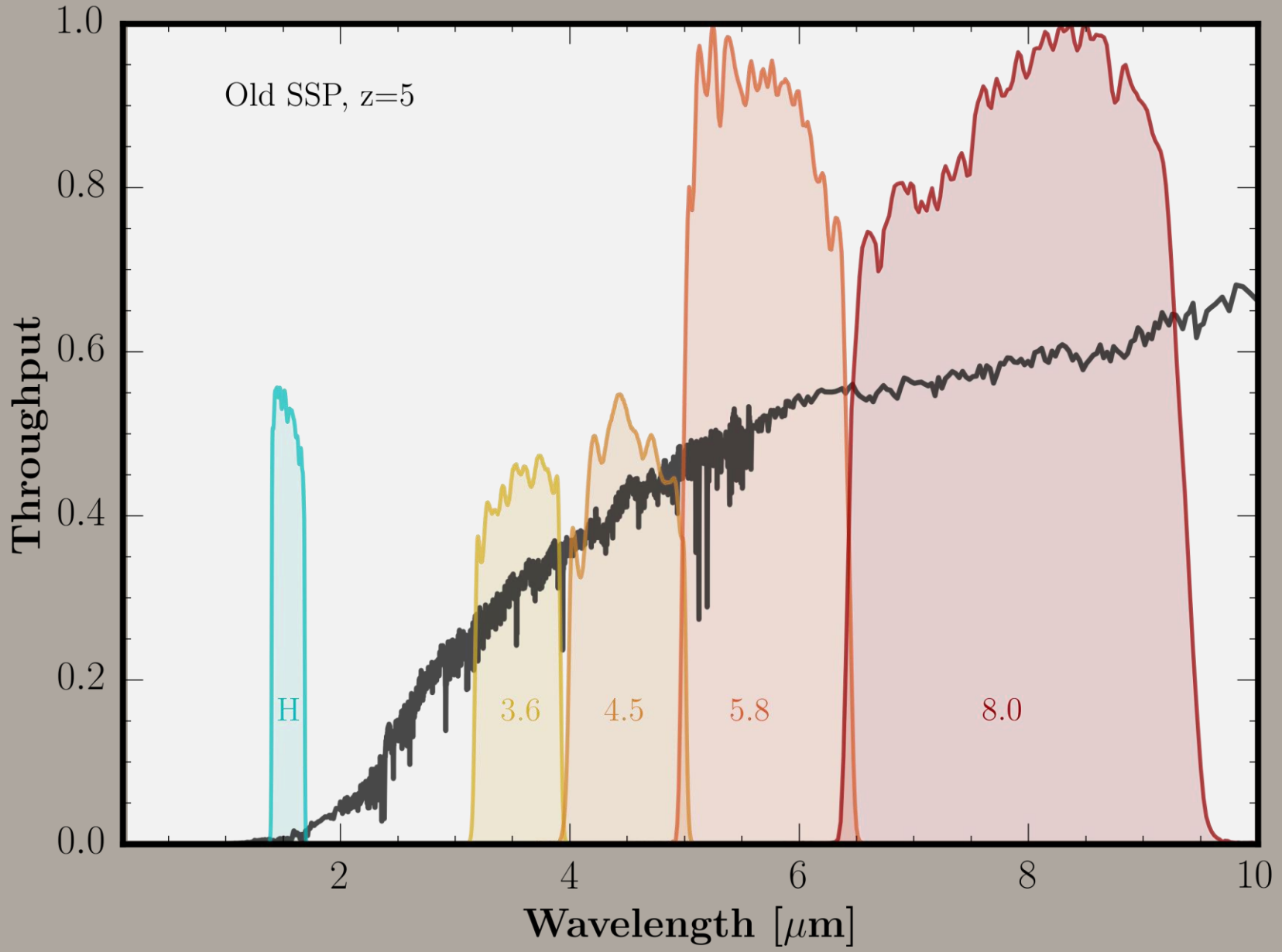
* Old?

Red galaxies in the rest frame



Red sources: H-Band dropouts

Distant red galaxies



Red sources: H-Band dropouts

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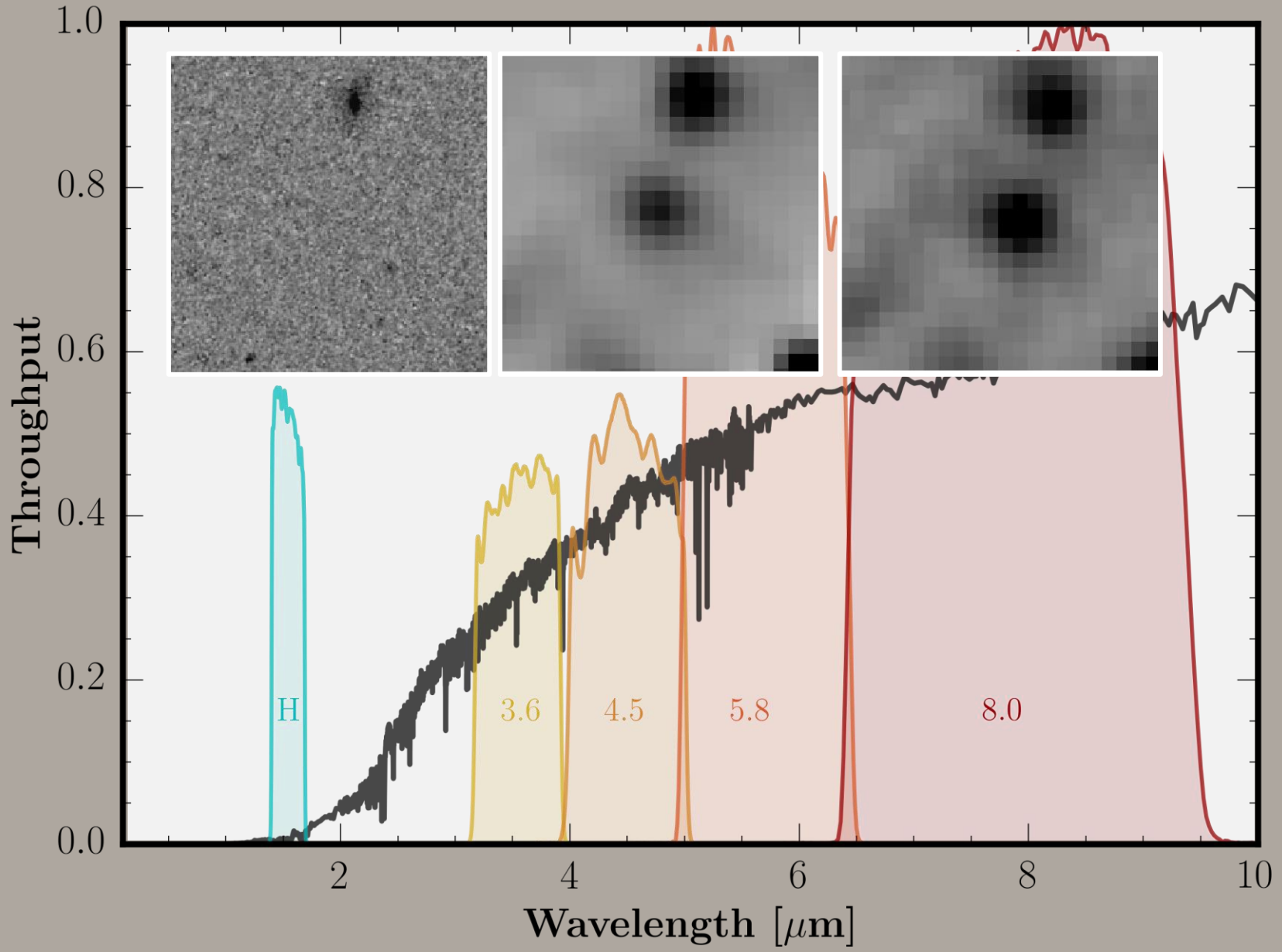

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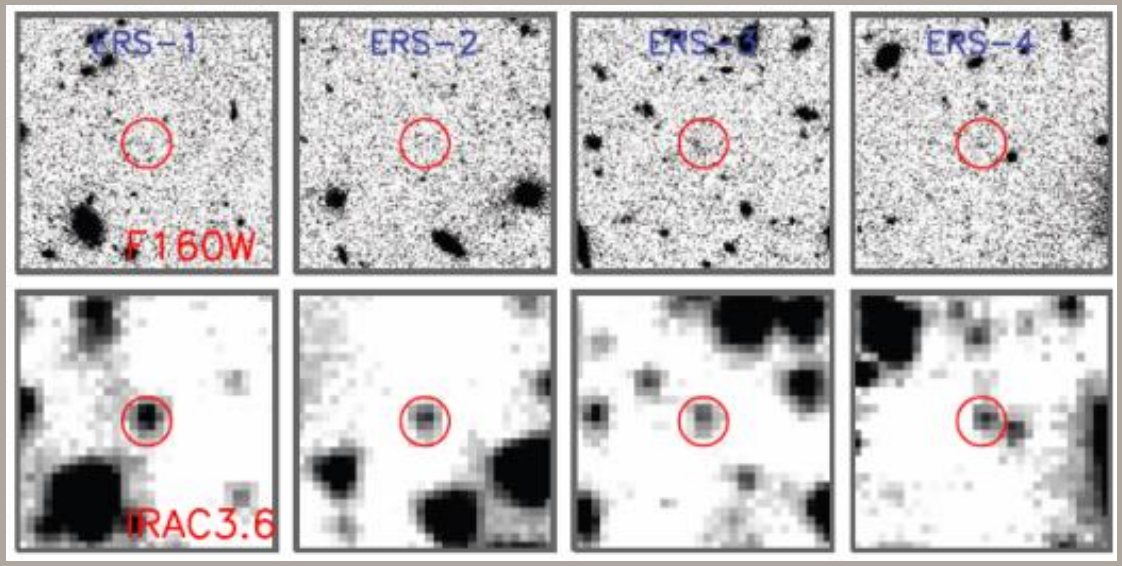
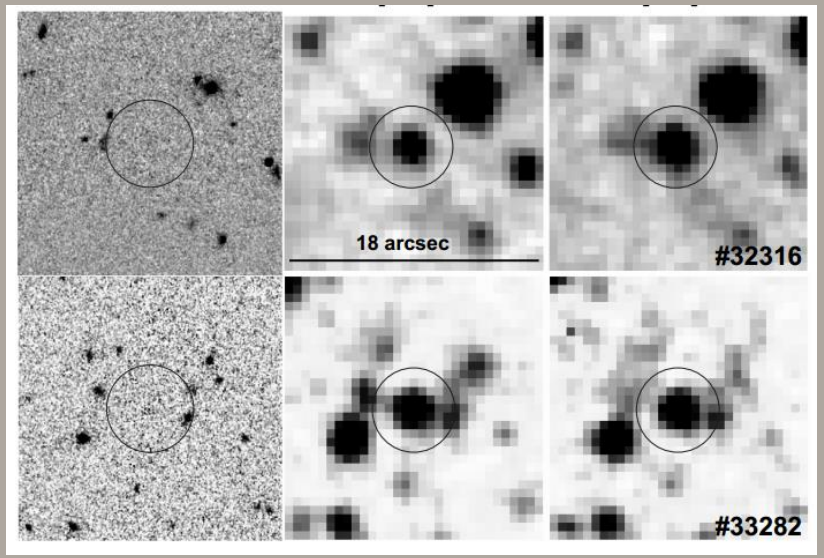


Huang et al. 2011

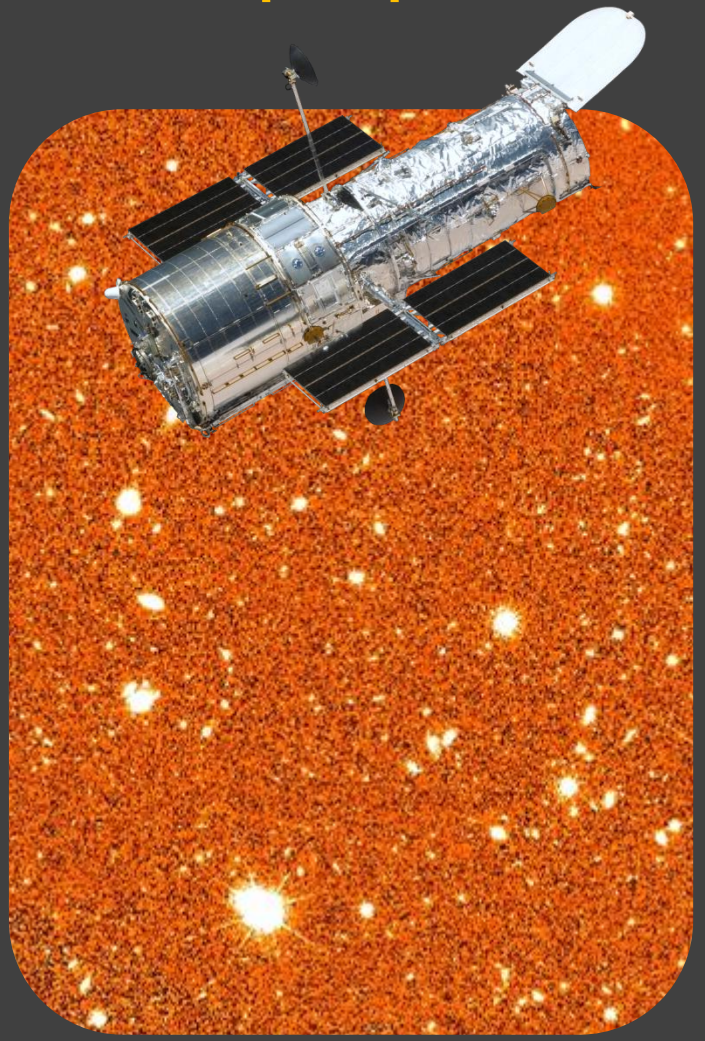


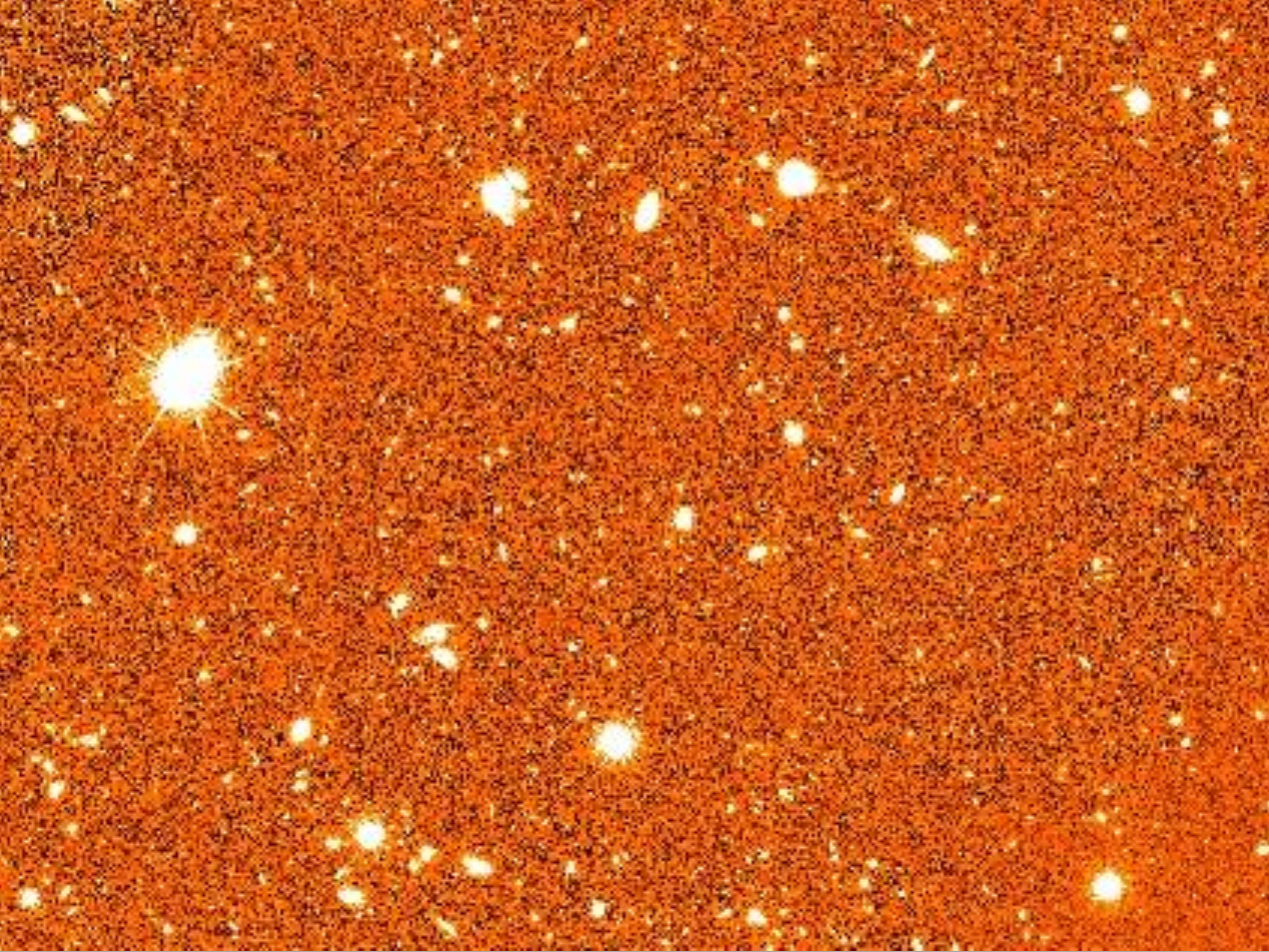
Caputi et al. 2012

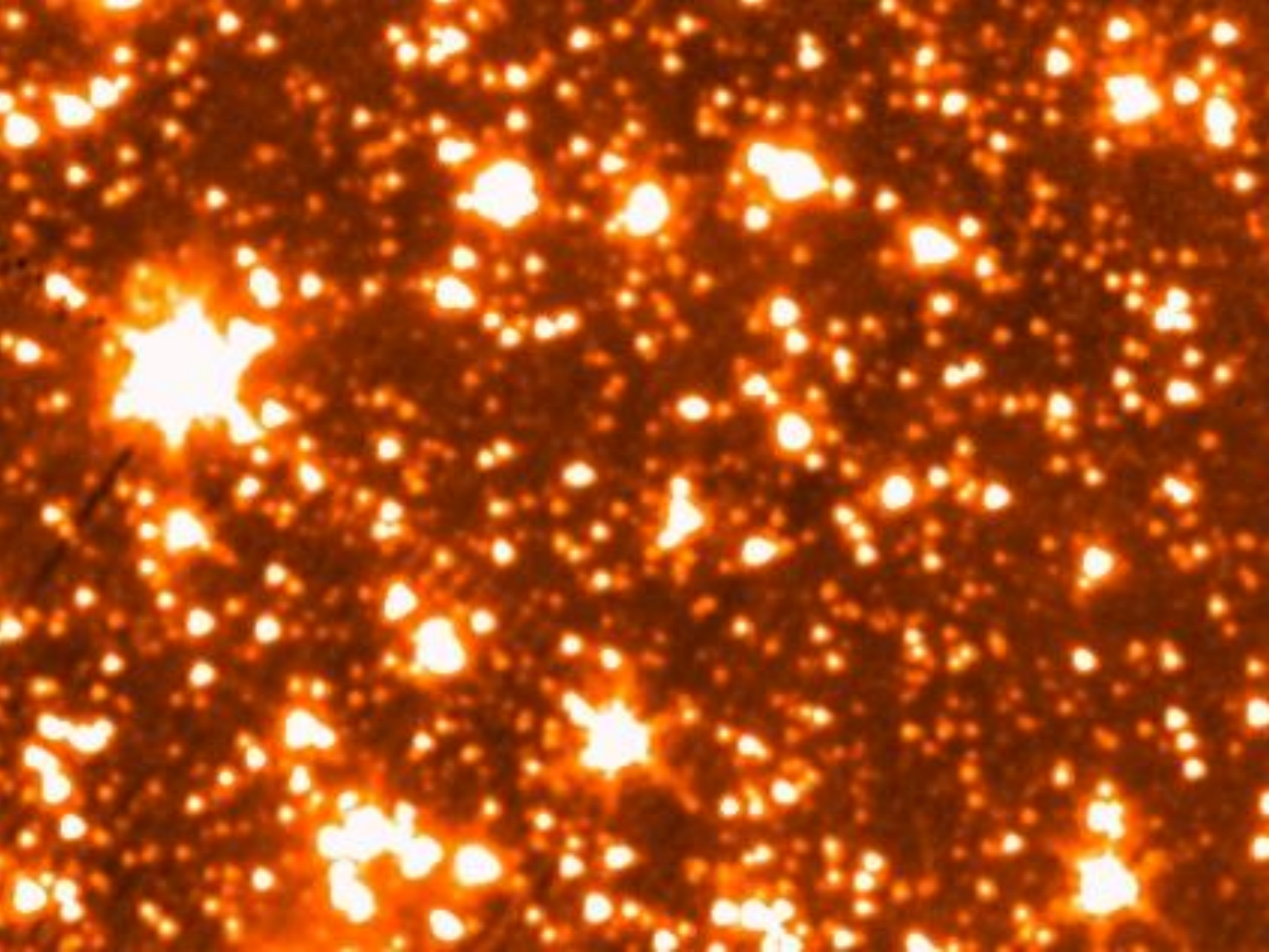
H-Band dropouts

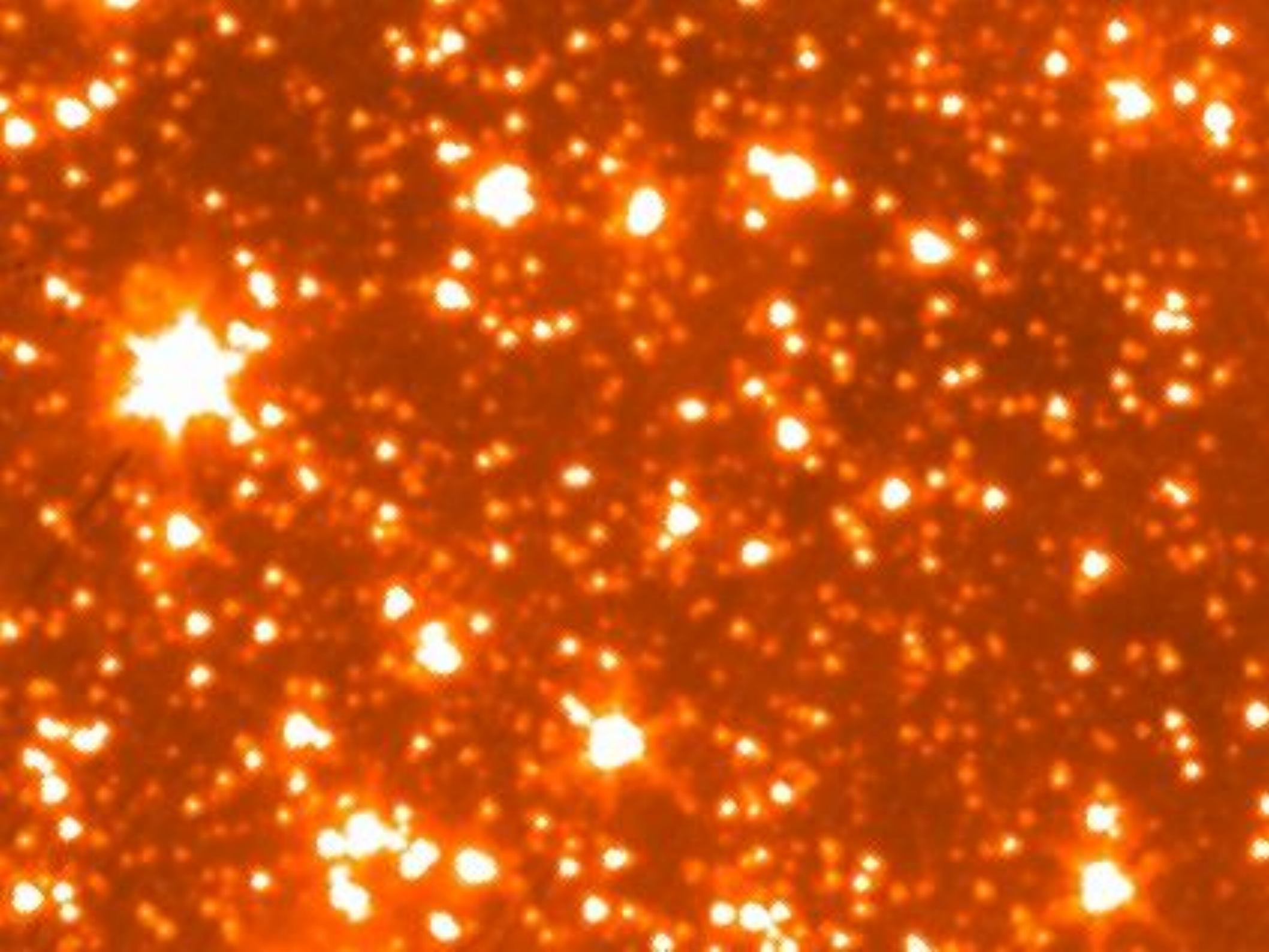
Spitzer Space Telescope

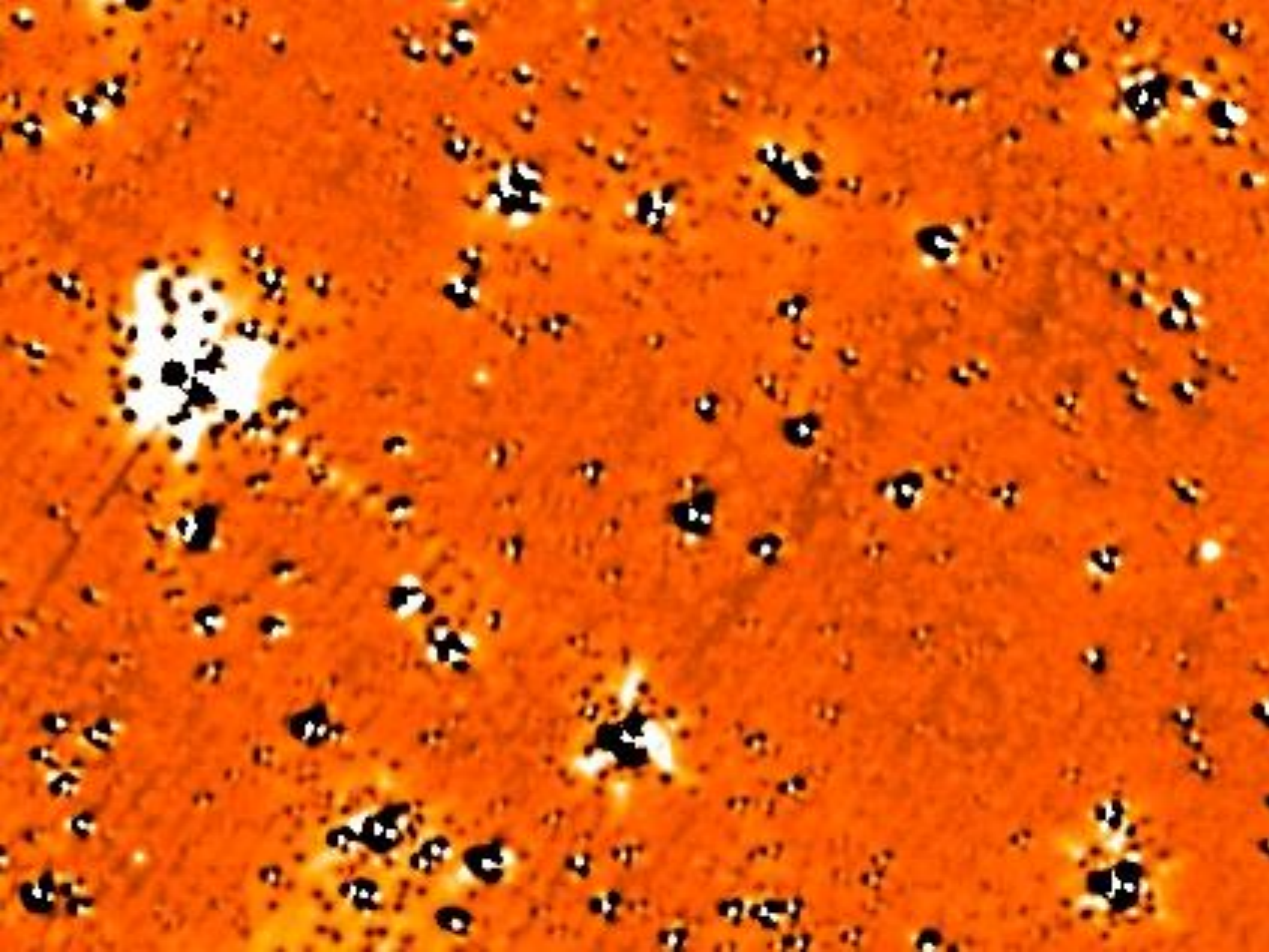
Hubble Space Telescope
[HST]



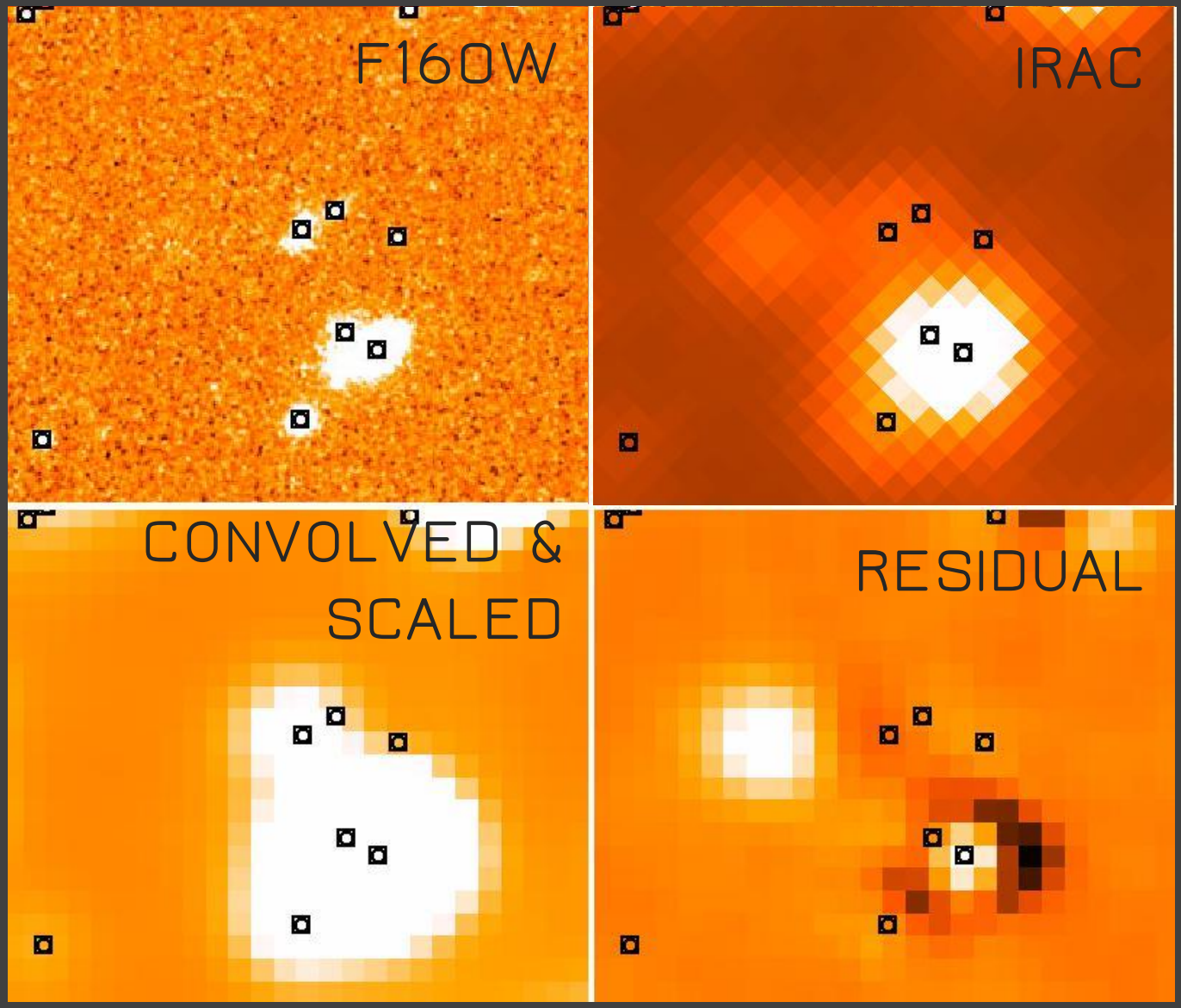




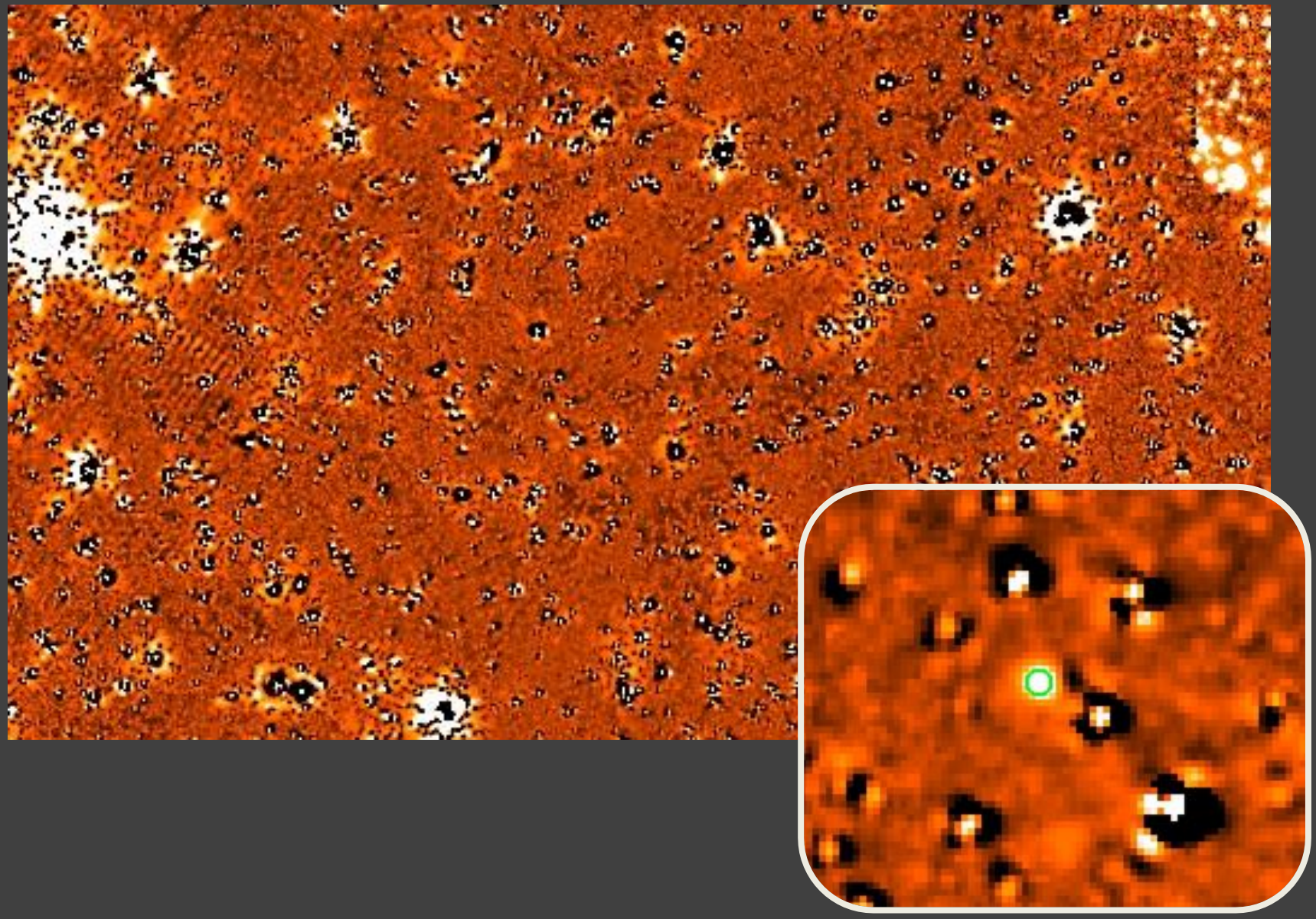




Selection process: TFIT



Selection process



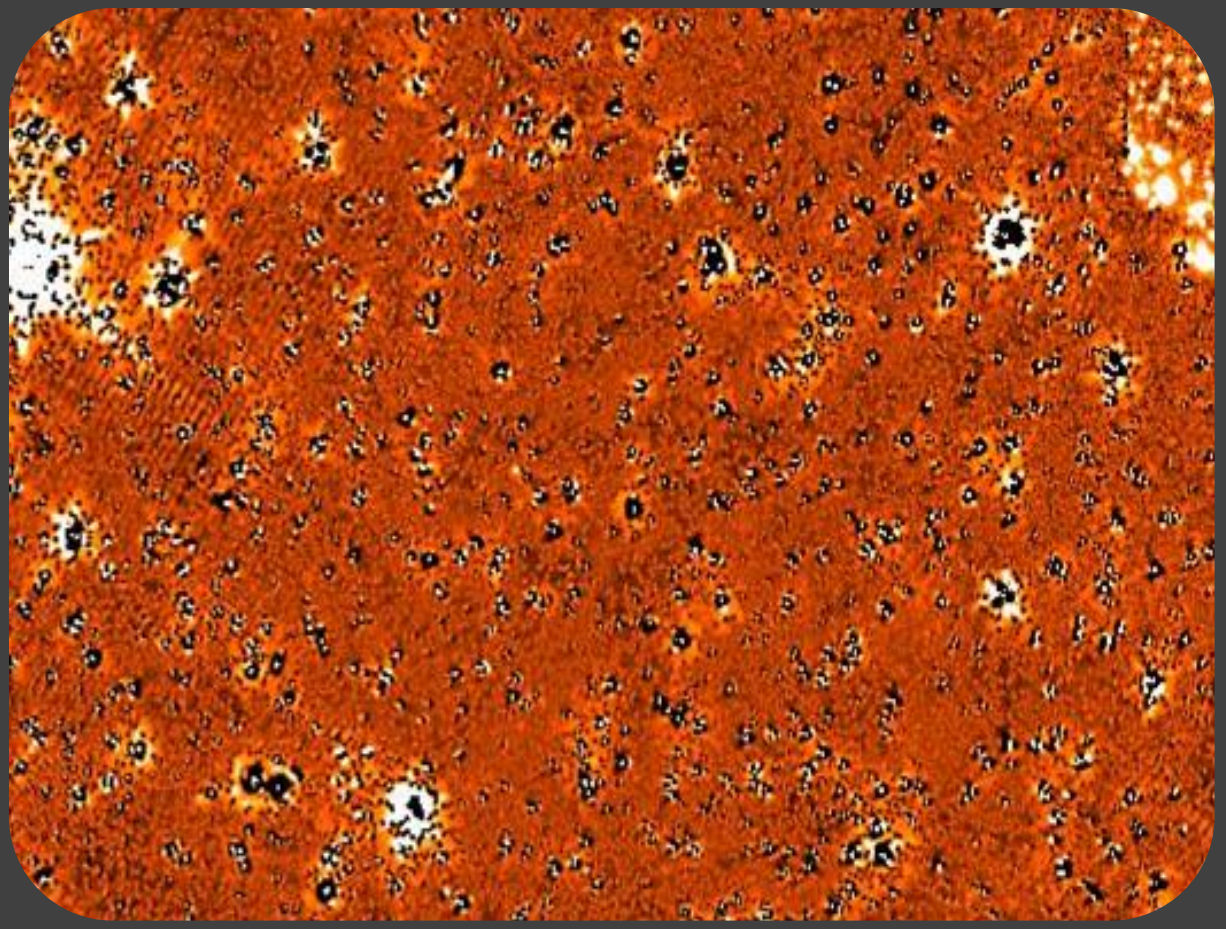
Selection process: Masks

stars

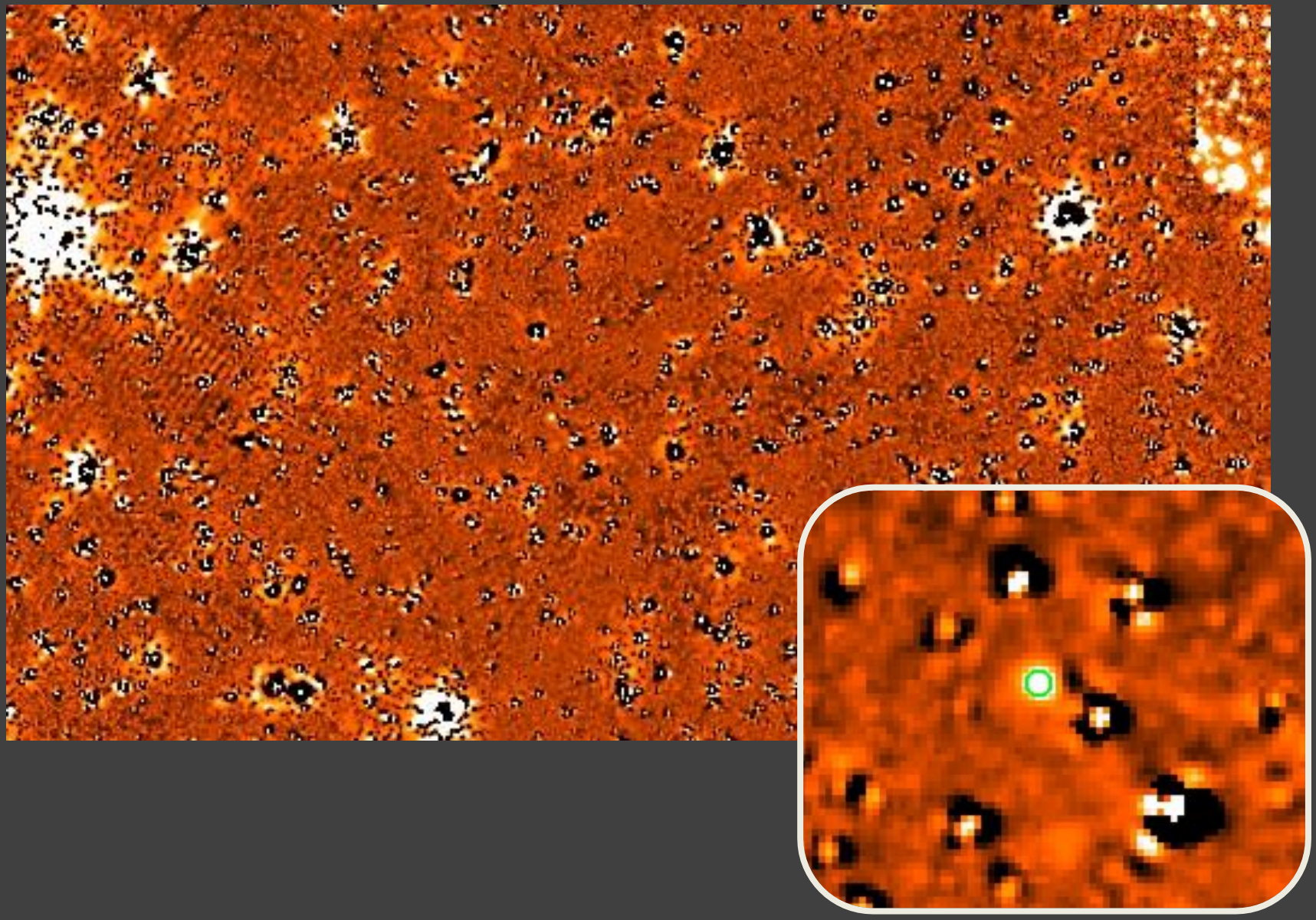
cores

pixels

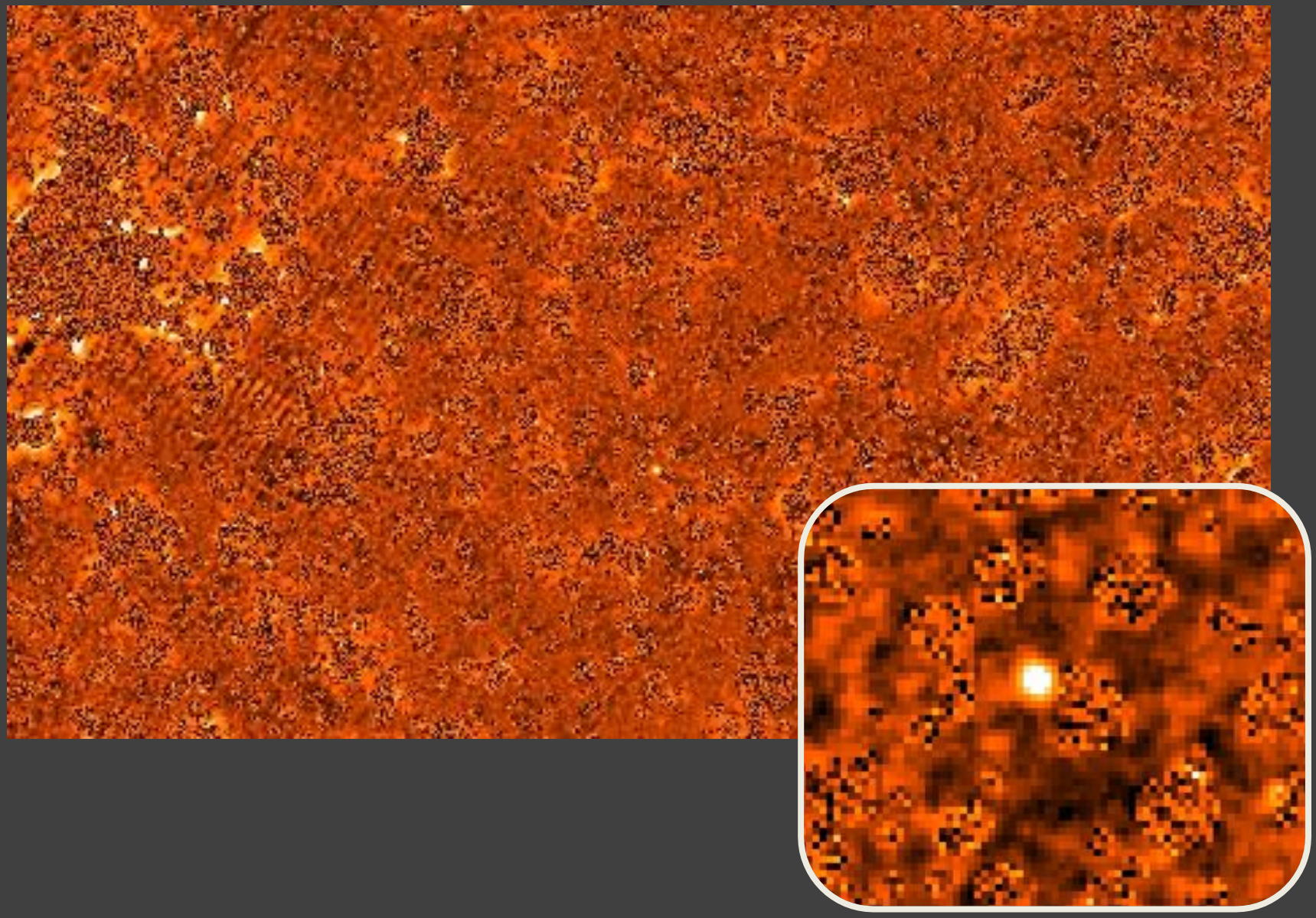
Apply masks to avoid spurious detections



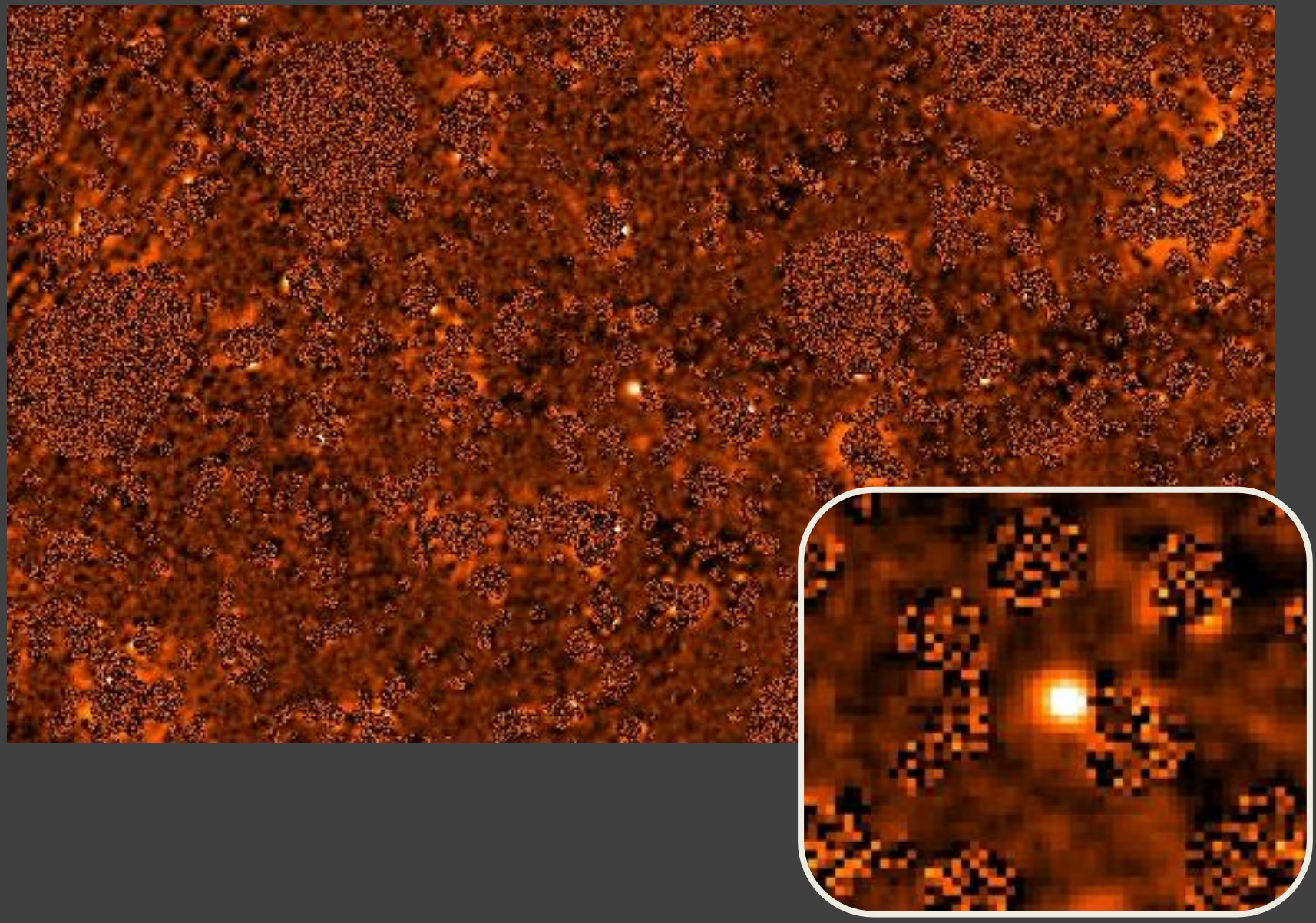
Selection process



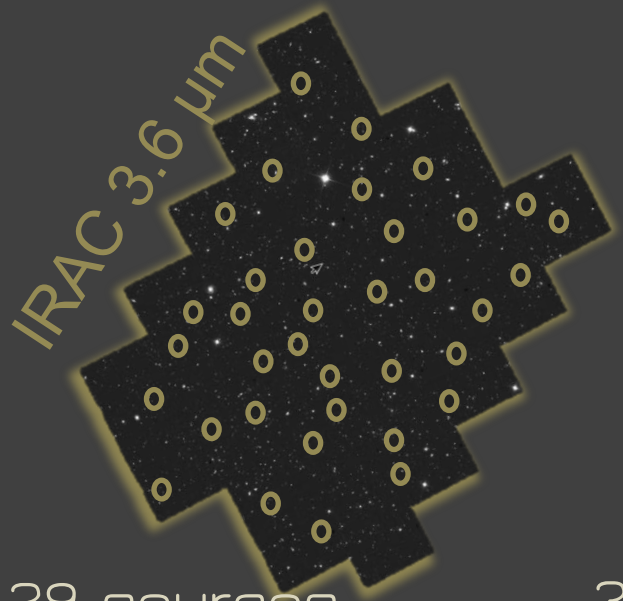
Selection process: Masks

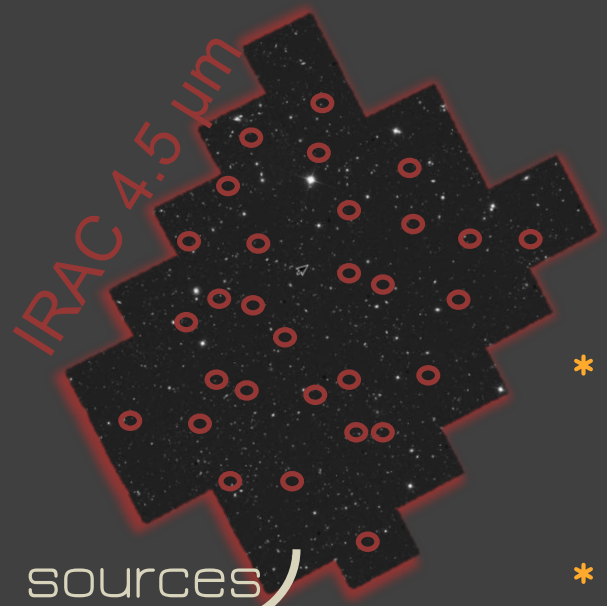


Selection process: wings



Selection process





39 sources

32 sources

31sources

* SEXtractor

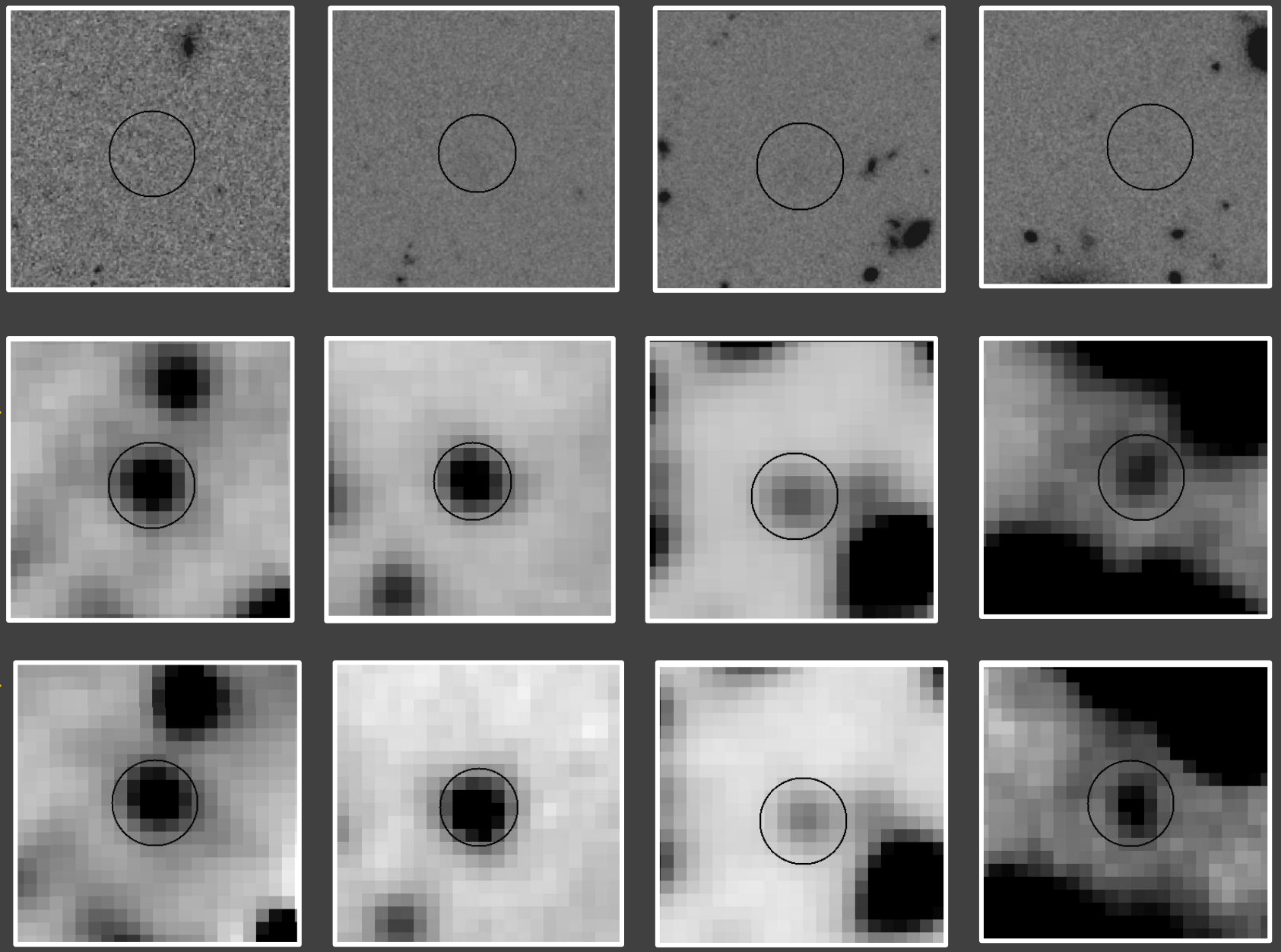
* cross-correlate

* visual inspection

19 *bona fide*

H-Band dropouts

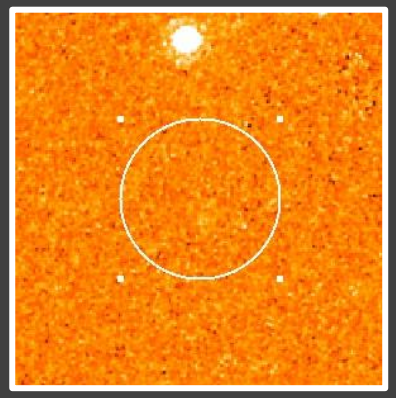
Nature of IRAC only sources



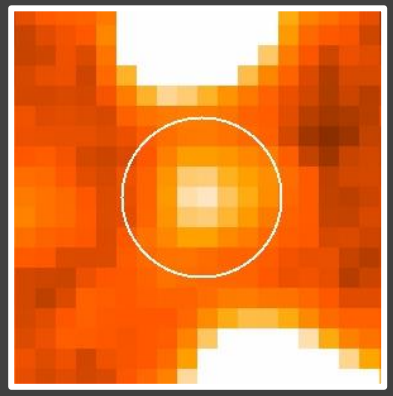
Pérez-González et al. 2005,08

Rainbow Database

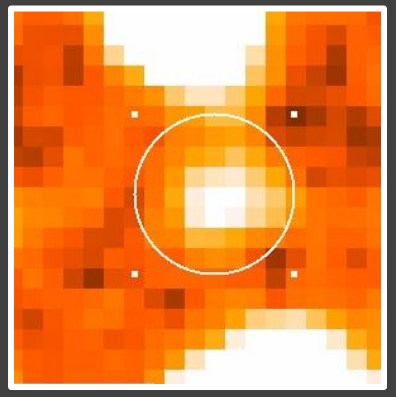
Nature of IRAC only sources



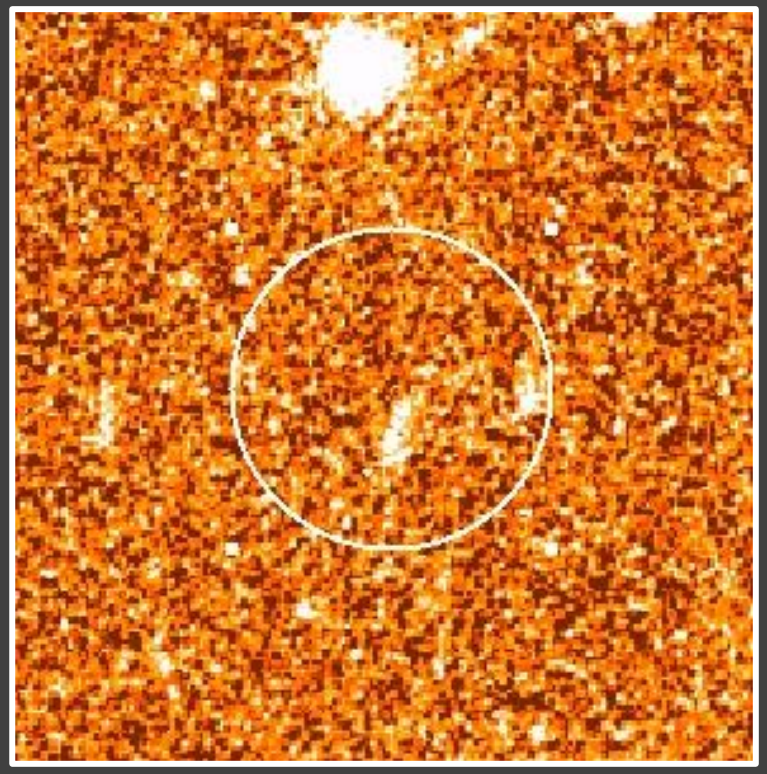
F160W [H]



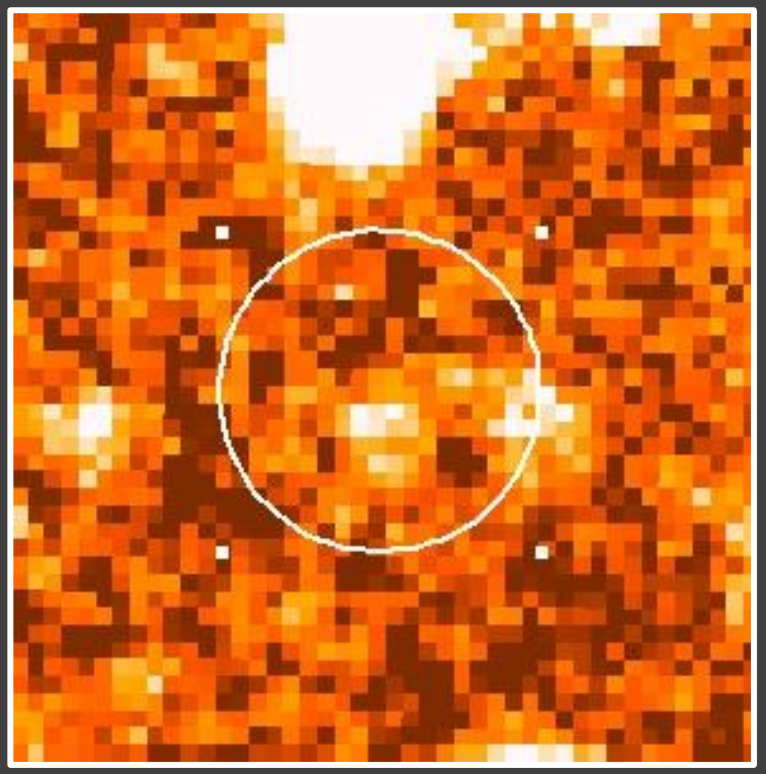
IRAC 3.6μm



IRAC 4.5μm

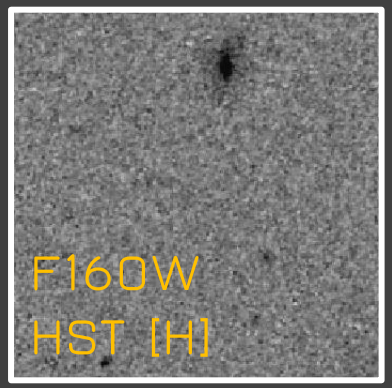


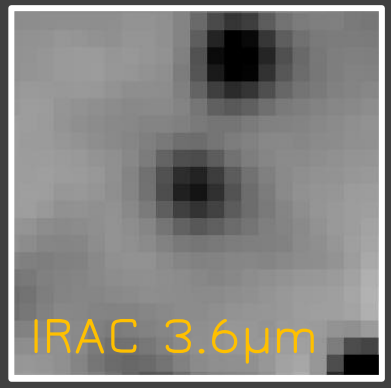
HST STACK 80%

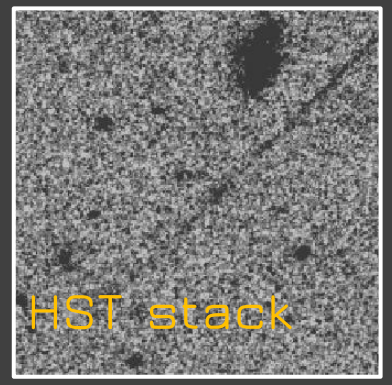


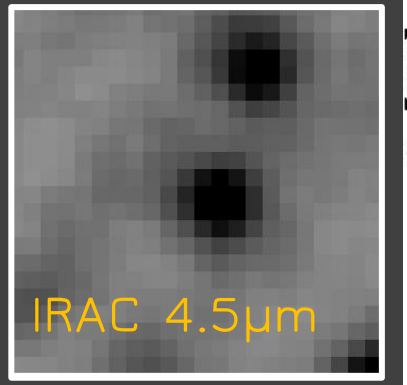
SHARDS STACK 50%

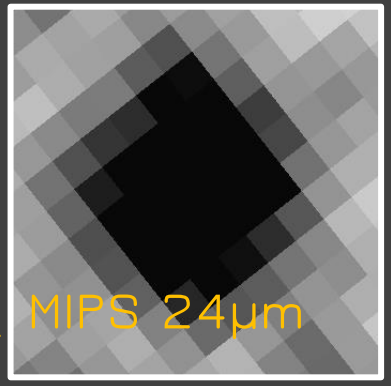
Search for counterparts

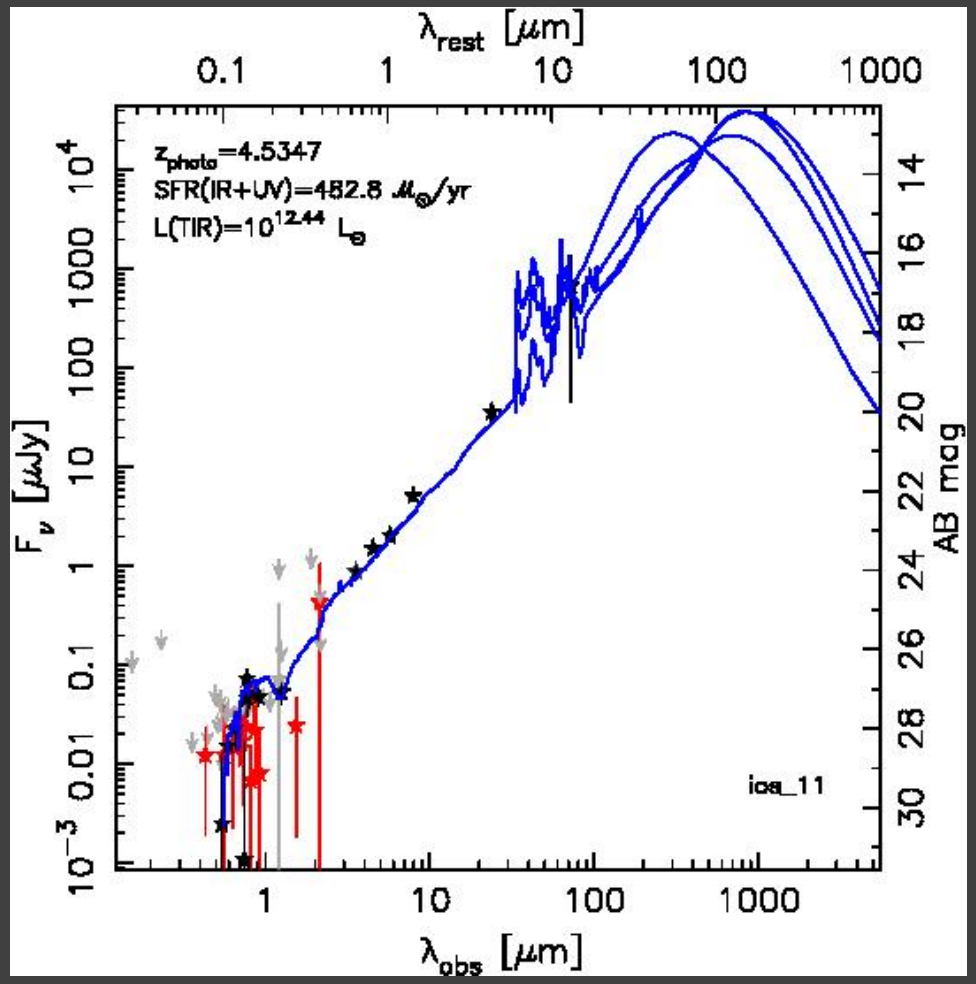












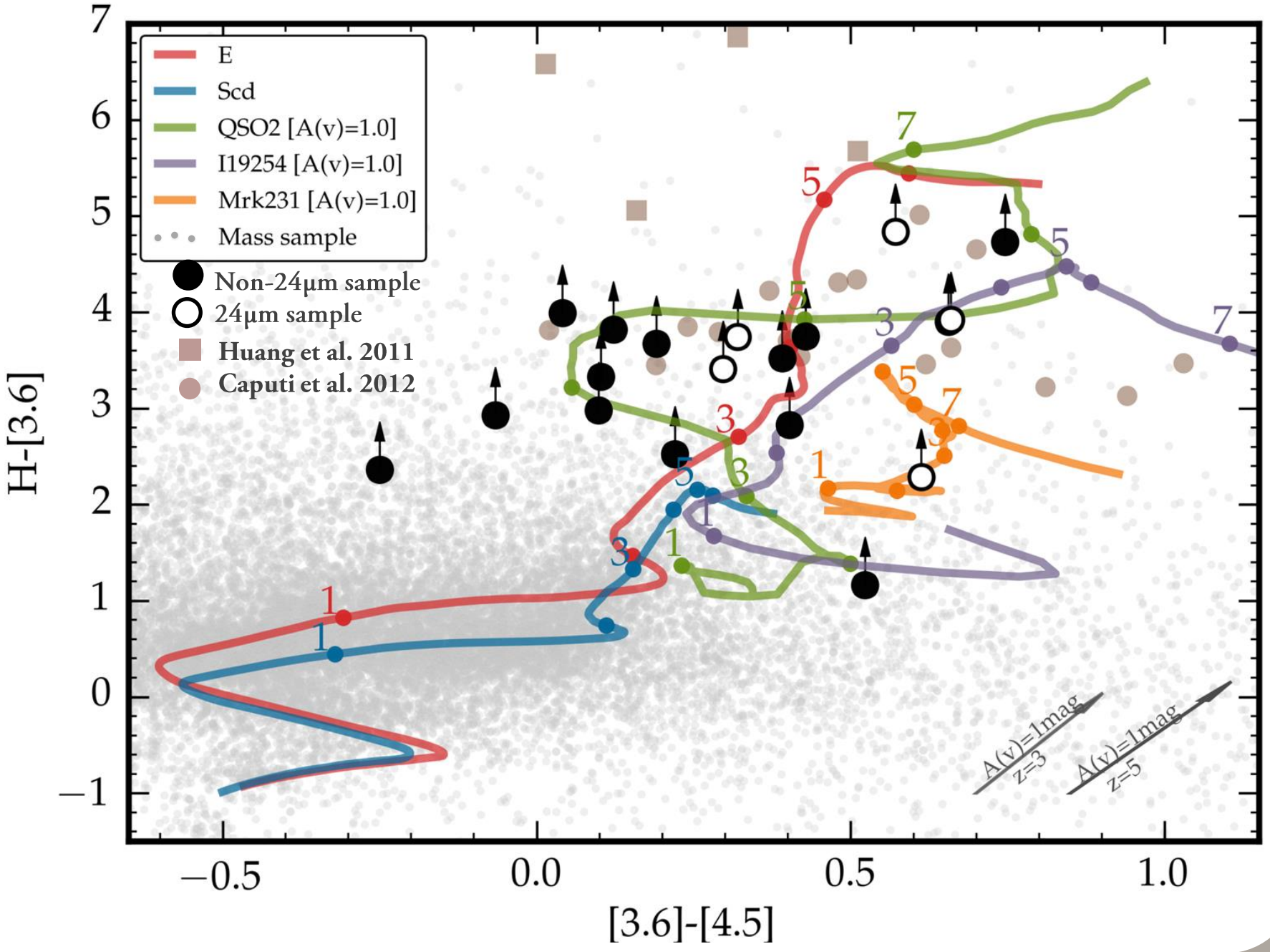
SED fitting

Pérez-González et al. 2005,2008

Rainbow Database

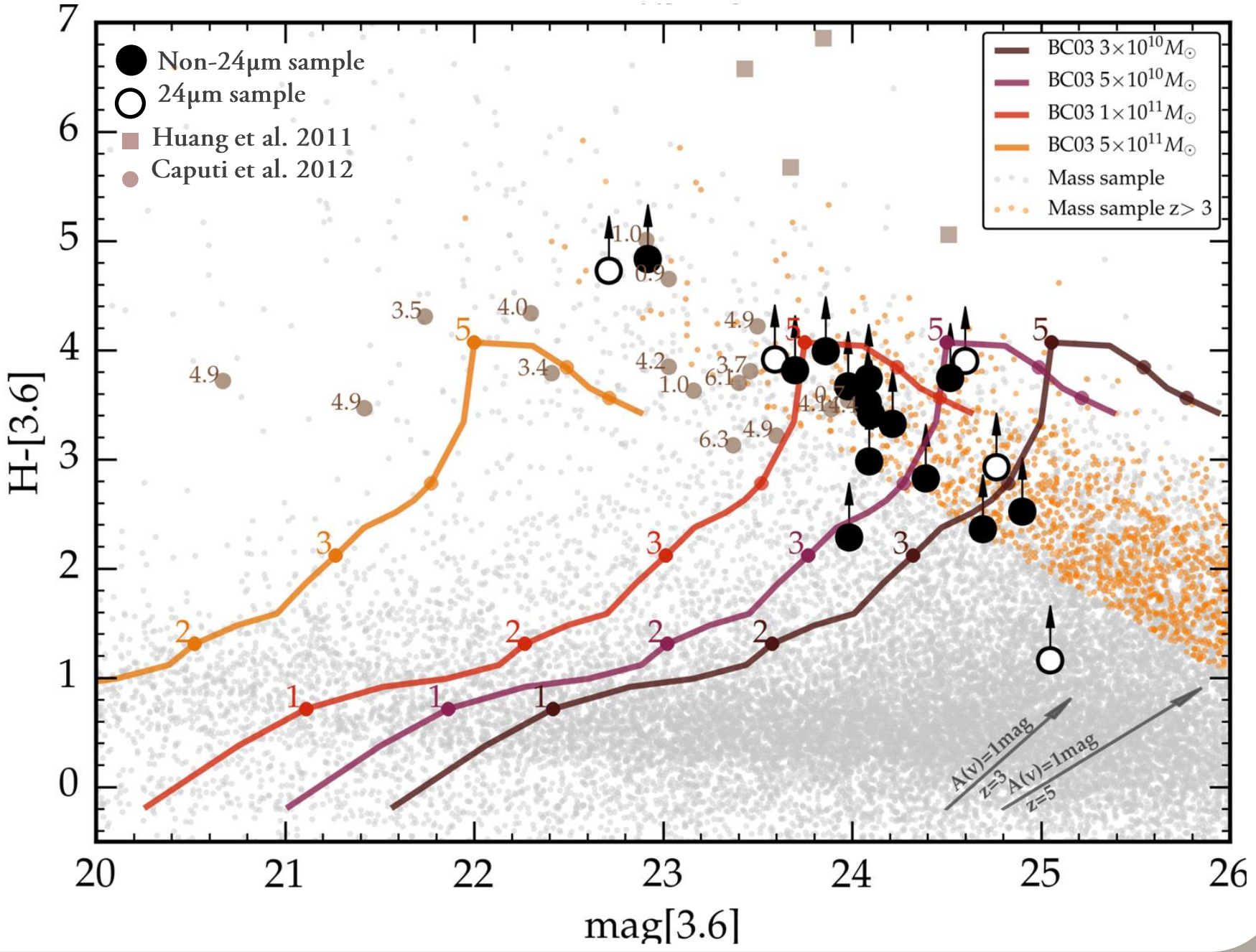
Nature of IRAC only sources

Color-color diagram

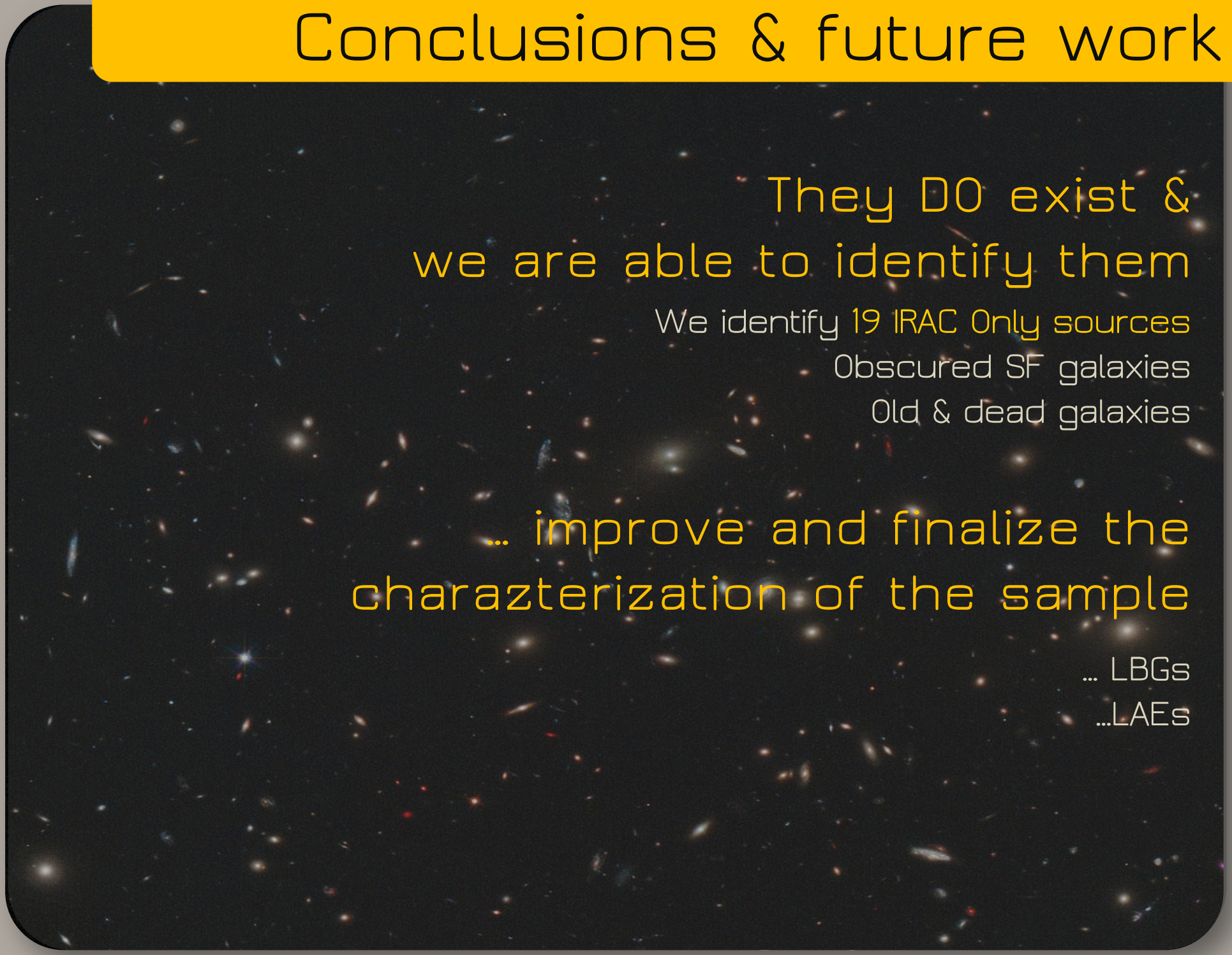


Nature of IRAC only sources

Color magnitude diagram



Conclusions & future work



They DO exist &
we are able to identify them

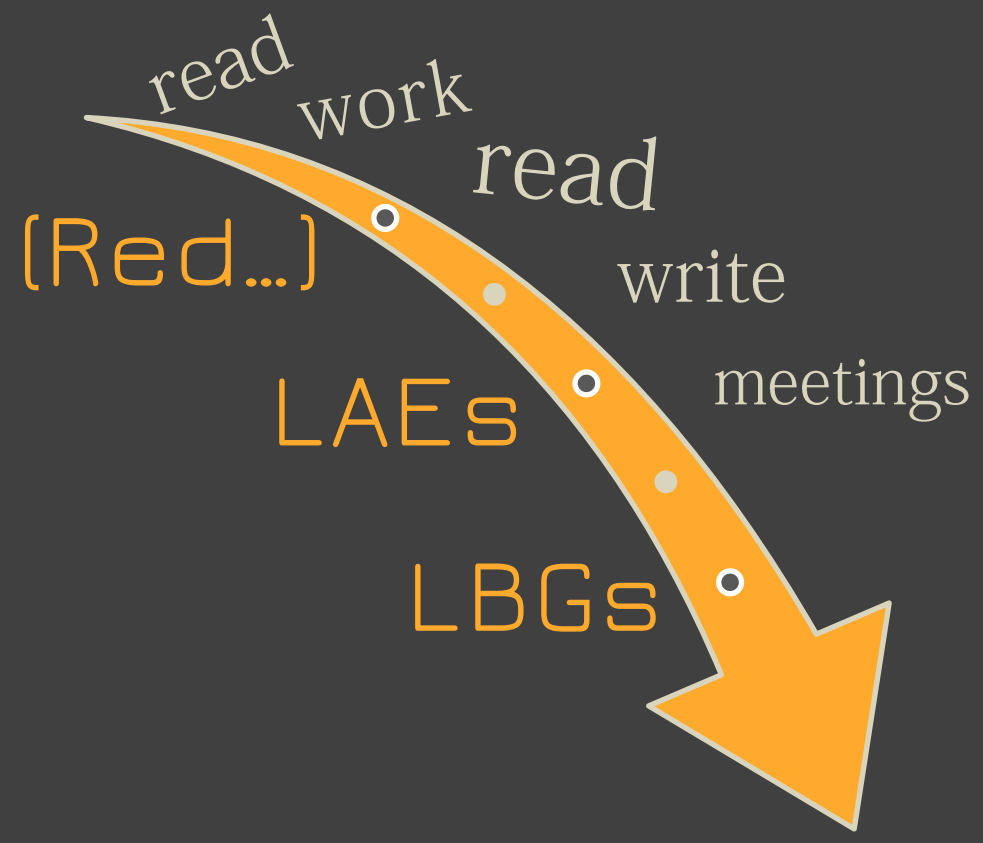
We identify 19 IRAC Only sources
Obscured SF galaxies
Old & dead galaxies

... improve and finalize the
charazterization of the sample

... LBGs
...LAEs

Thanks!

Future work ...


read
work
read
(Red...)
write
meetings
LAEs
LBGs
PhD!

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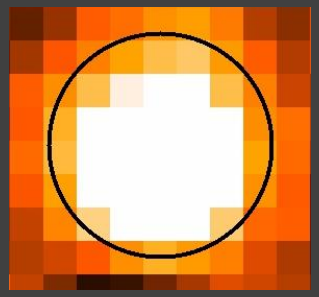
Nature of IRAC only sources

Search for counterparts

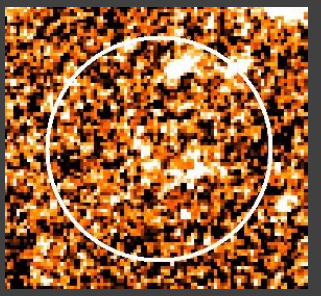
* Only IRAC



Centroid + offset

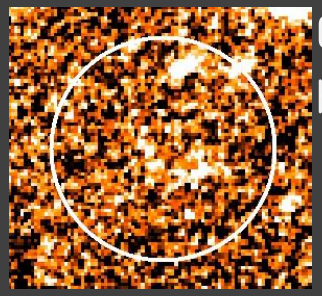
* HST
80%

Recentre + centroid

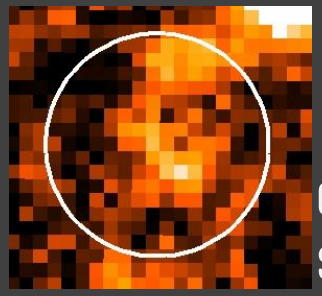


* HST & SHARDS
50%

Recentre +



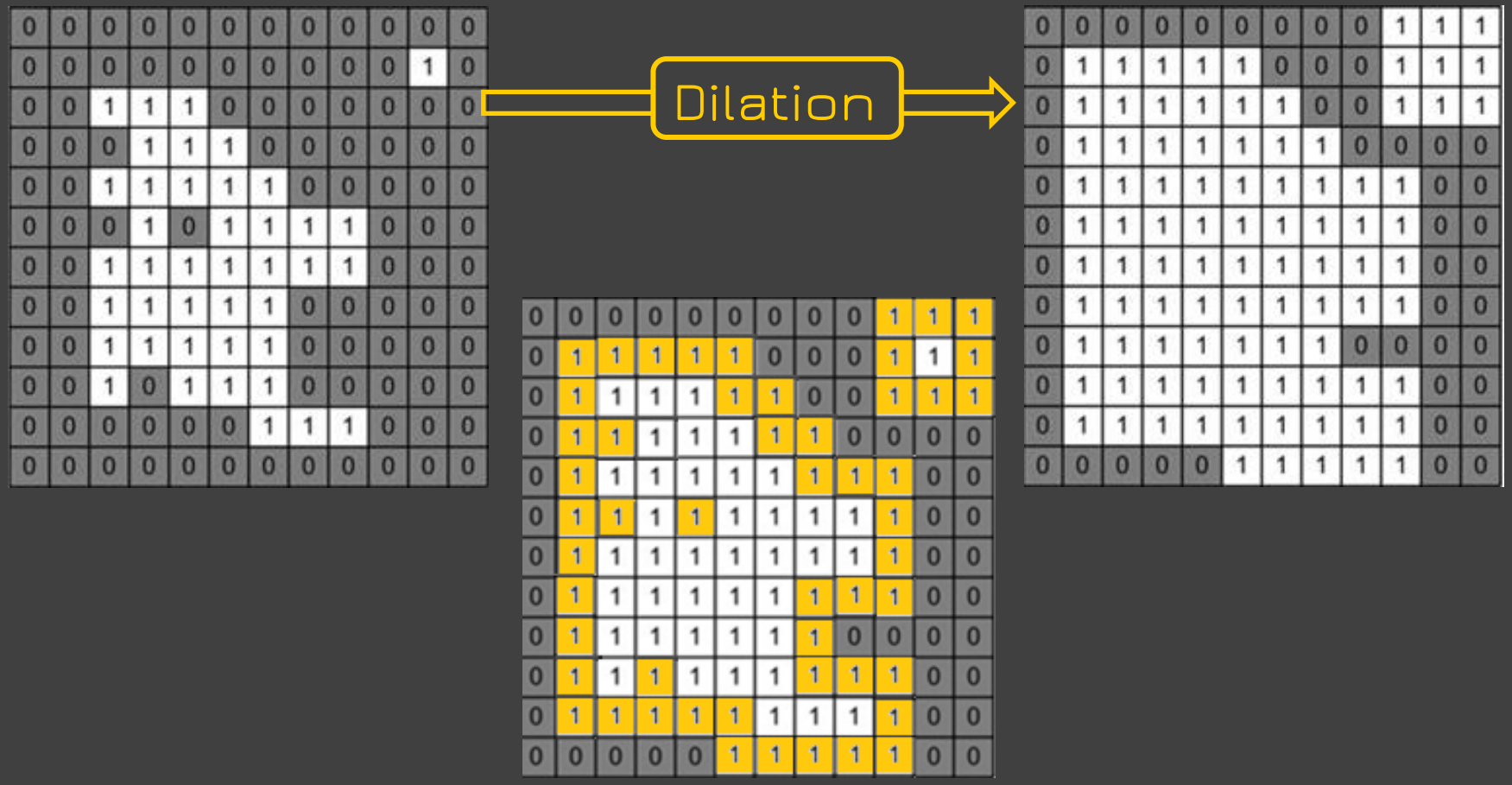
Centroid
HST



Centroid
SHARDS

+ median

Selection process: wings



Pixel value – outline median + background + noise

Future work ...