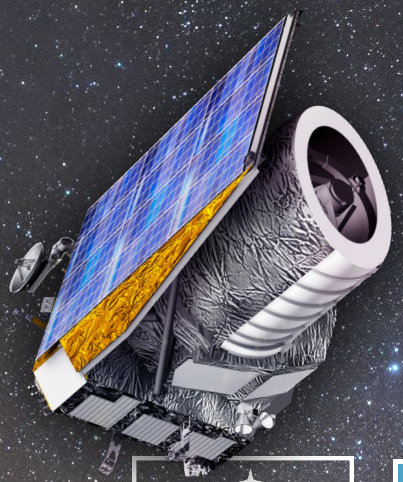
HIDDEN BELOW THE DUST

Belén Alcalde Pampliega
PASSAGES collaboration
Euclid Galaxy Evolution, 28th October

HIDDEN BELOW THE DUST



The serendipitous discovery of an extremely bright lensed SMG behind the Lupus-1 molecular cloud.

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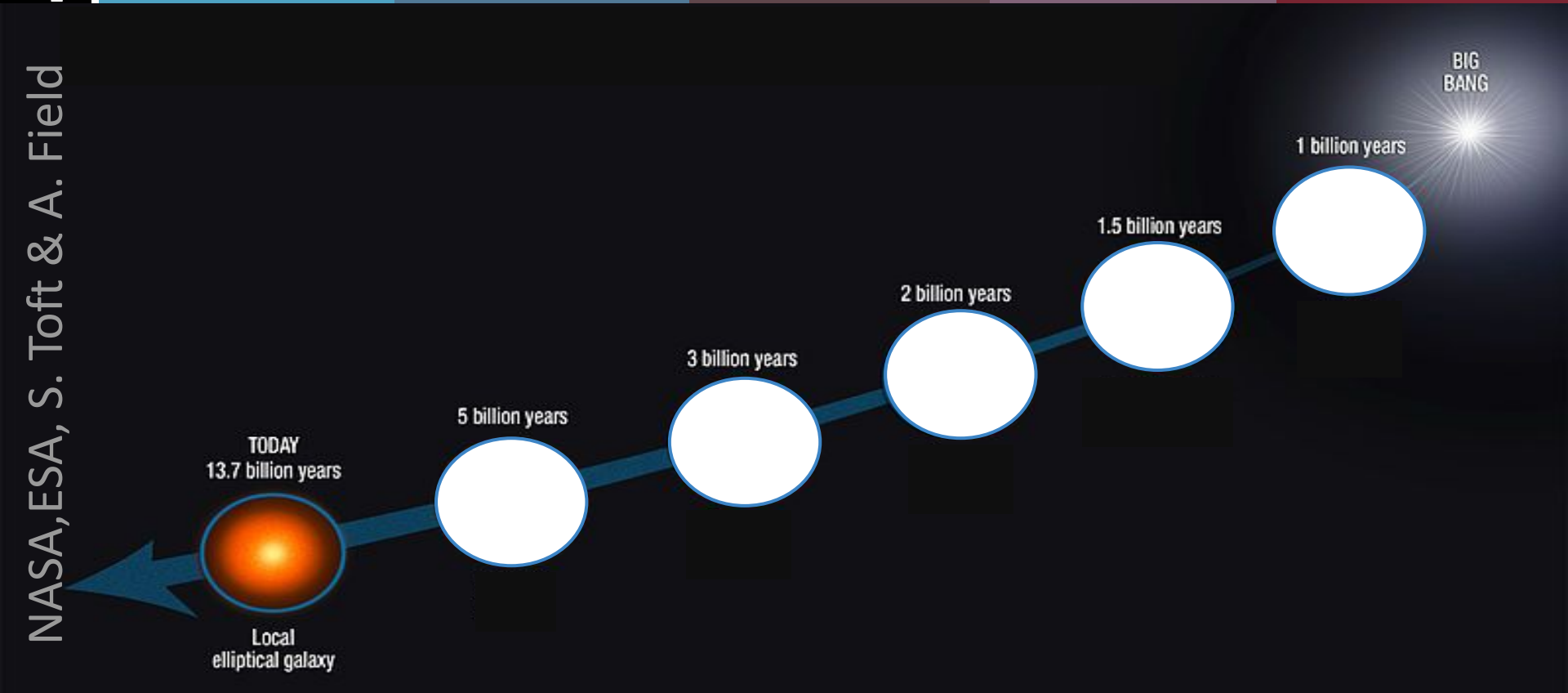
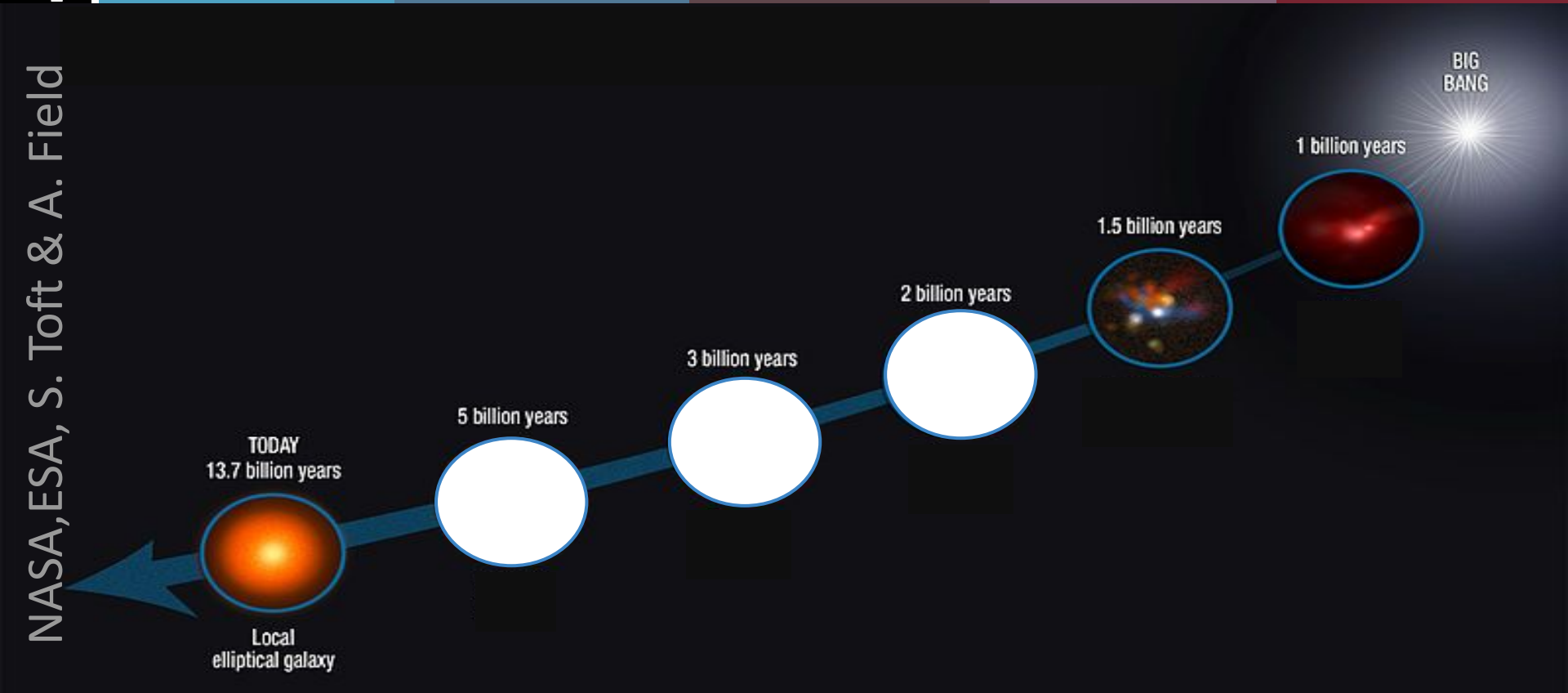
Euclid Galaxy Evolution, 28th October

Massive local galaxies evolution



NASA,ESA, S. Toft & A. Field

Massive local galaxies evolution



Galaxy formation paradigm

=

Local ellipticals

Galaxy formation paradigm

=

Local ellipticals ancestors

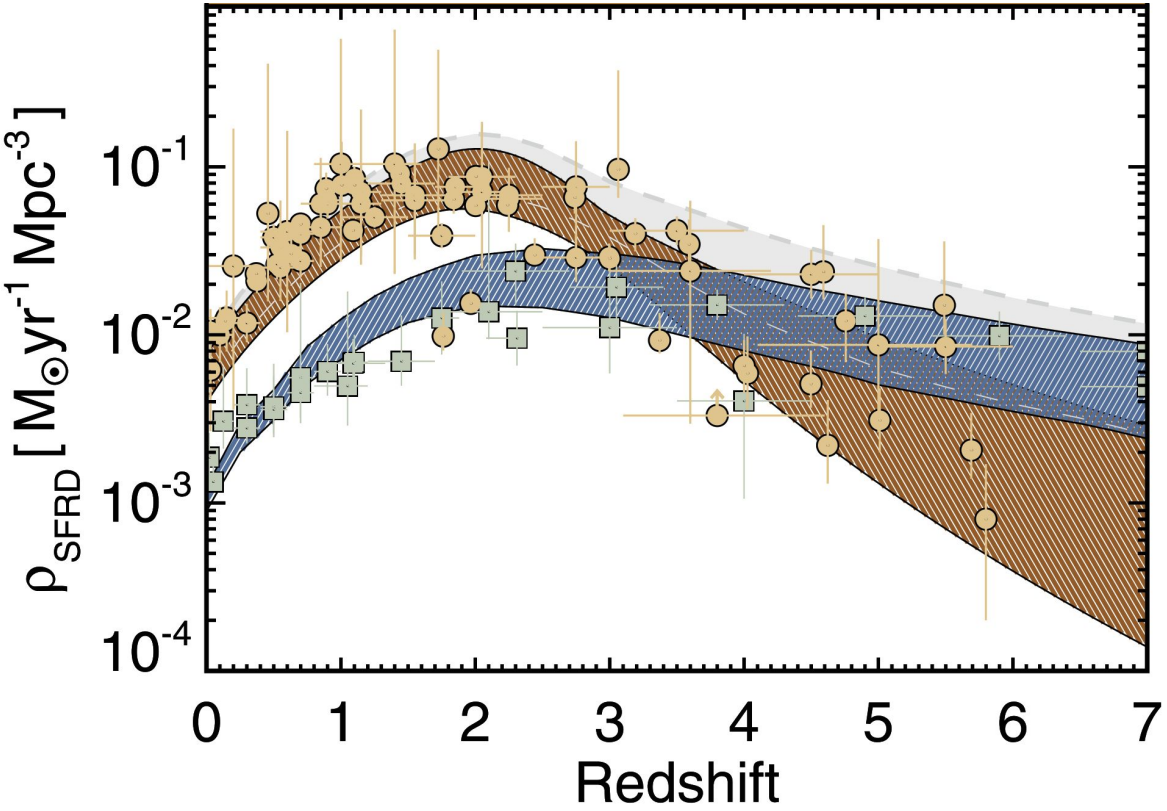
?

Massive high redshift galaxies

- Redshift distribution and number density
- Star formation activity (CSFRD)
- Spatial distribution of gas, dust & stars *DM*
- ISM & SF properties vs. local

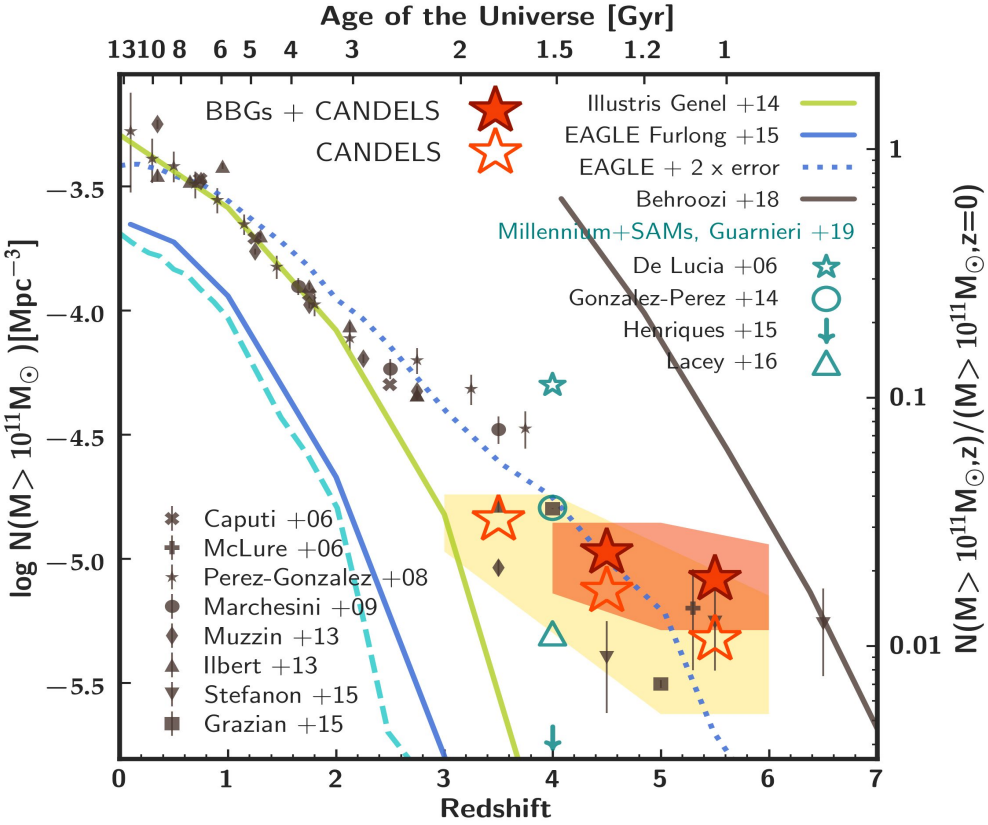
Massive high redshift galaxies

Zavala +21



Massive high redshift galaxies

Alcalde-Pampliega +19



Limitations

Expectations for the local Universe

Expectations for distant Universe

Limitations: depth & resolution

What we see in the local Universe

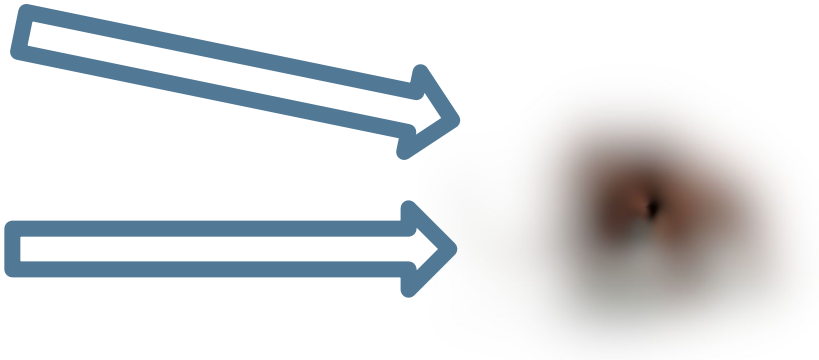
What we see in the distant Universe

Way out

Requirements:

Resolution

Sensitivity



Way out

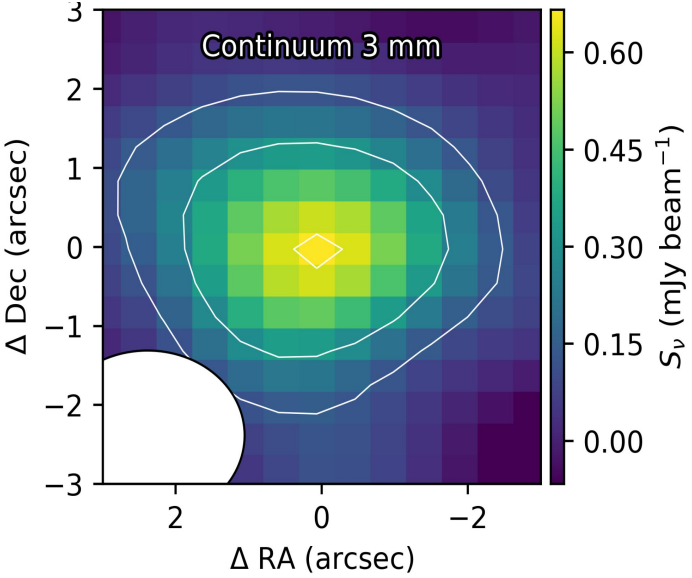
Requirements:

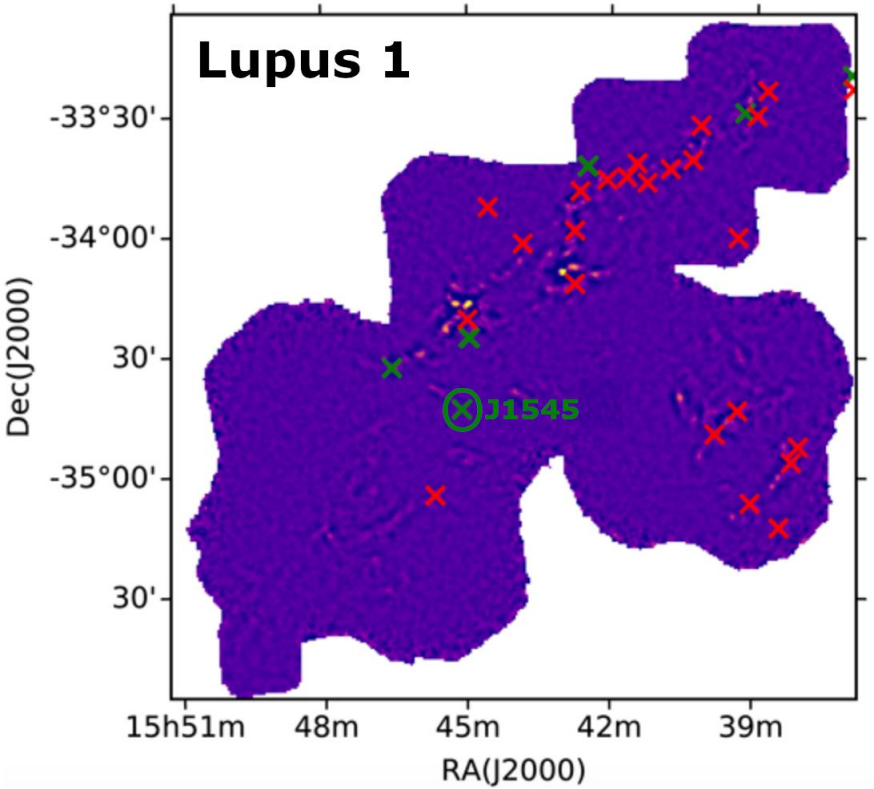
- Resolution
- Sensitivity

Way out: gravitational lensing

Strongly lensed
highly magnified galaxies

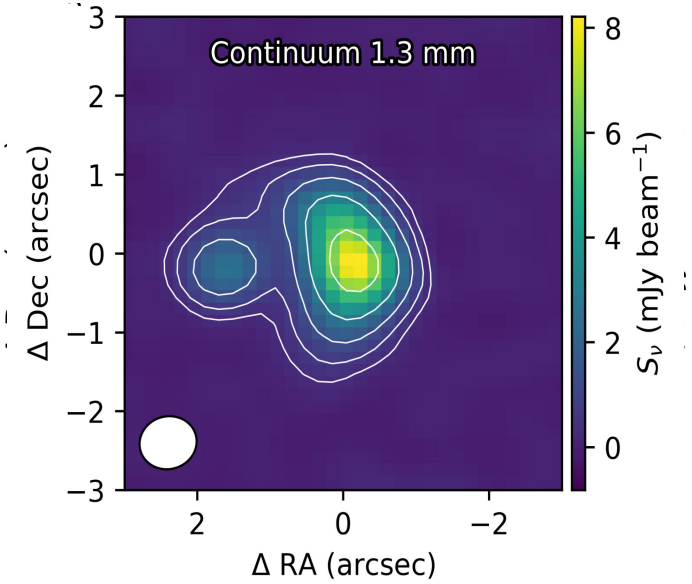
J1545: Hidden below the dust

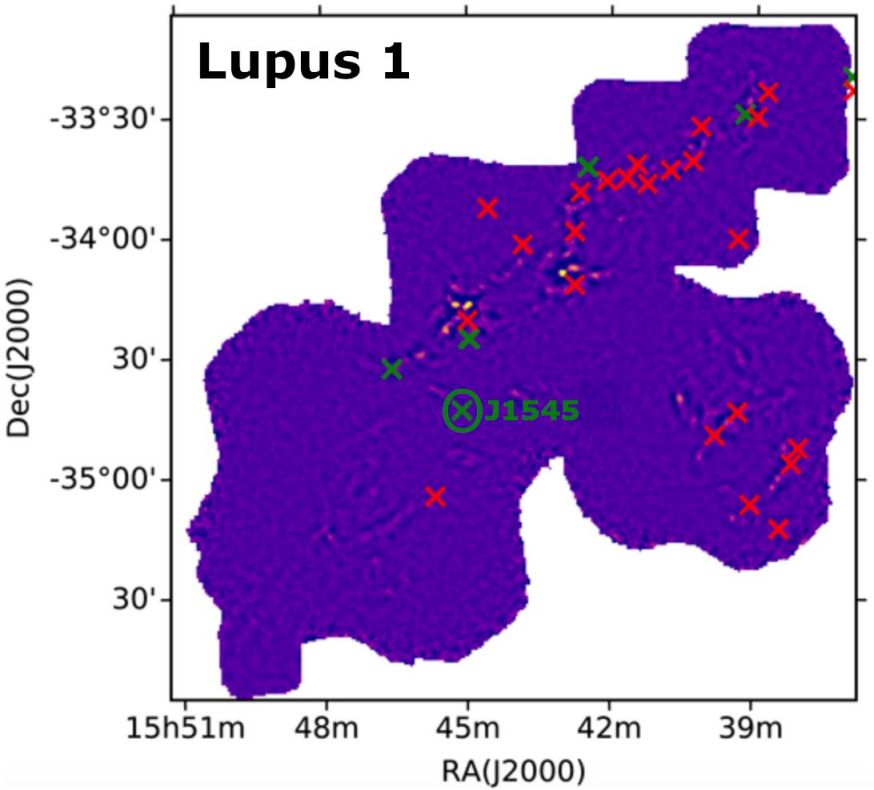




Santamaría-Miranda +21

J1545: Hidden below the dust





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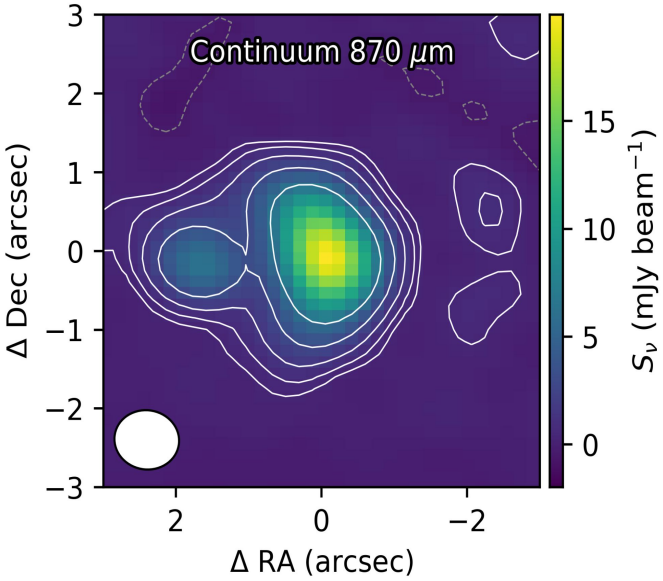

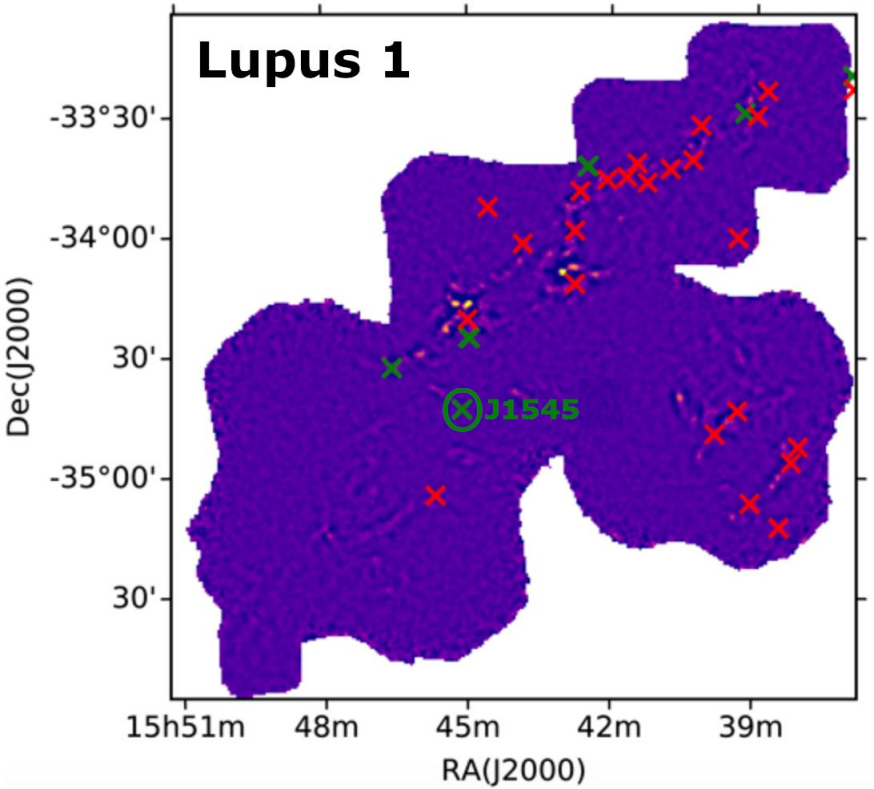

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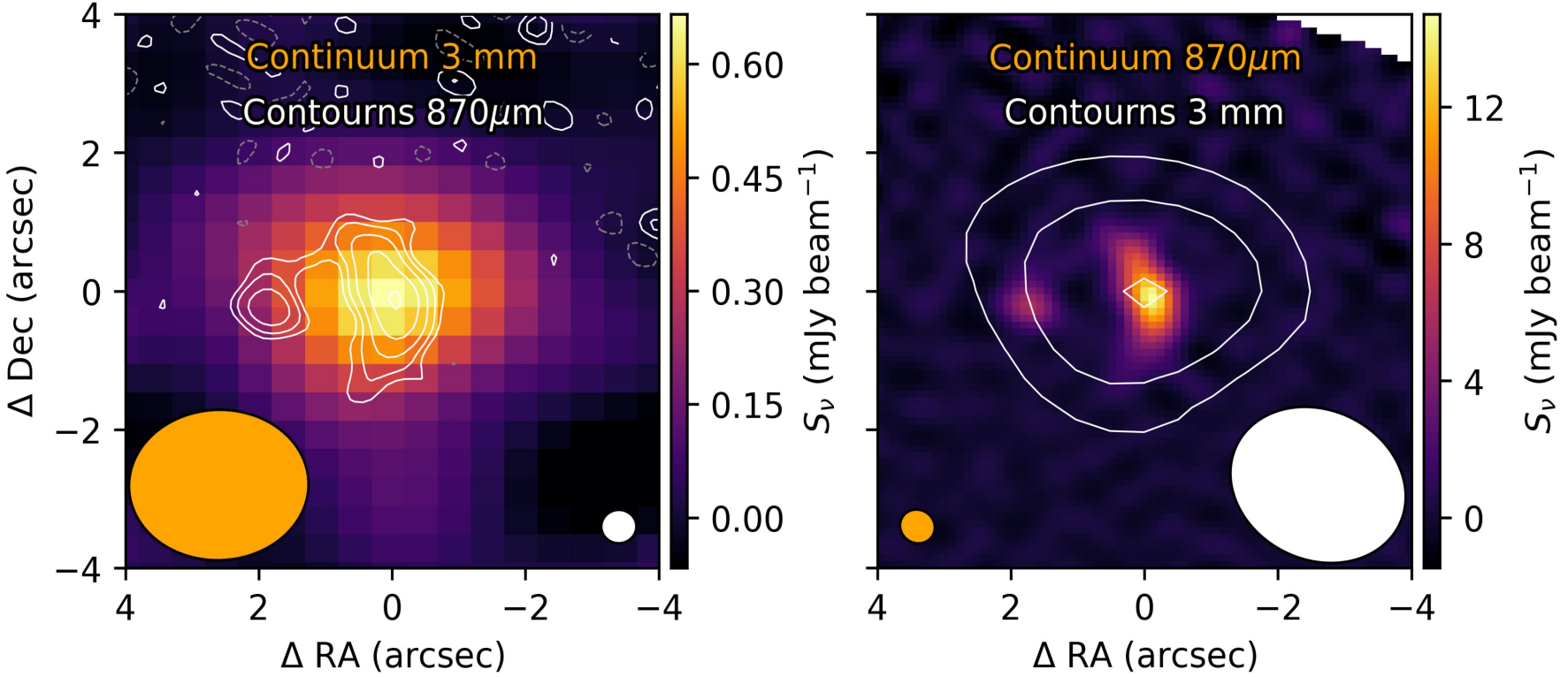

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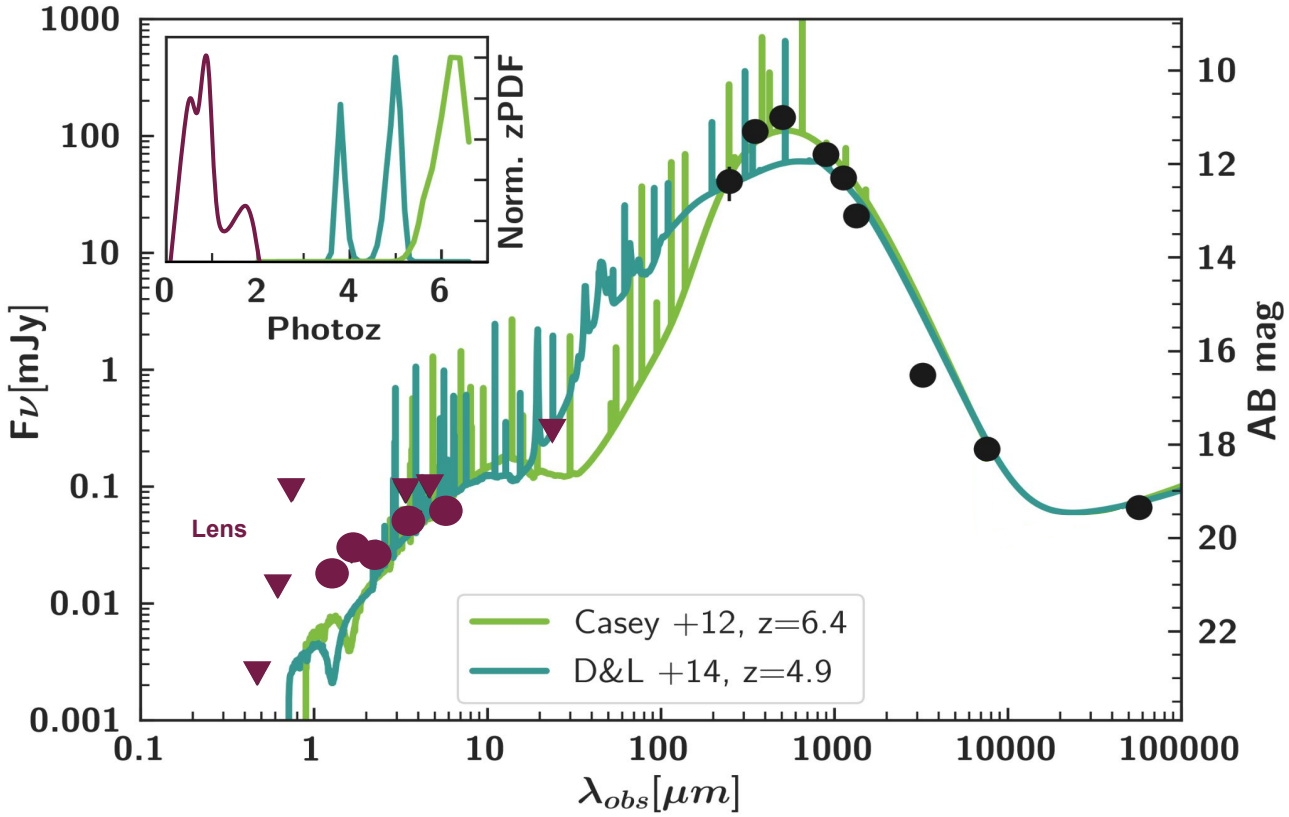

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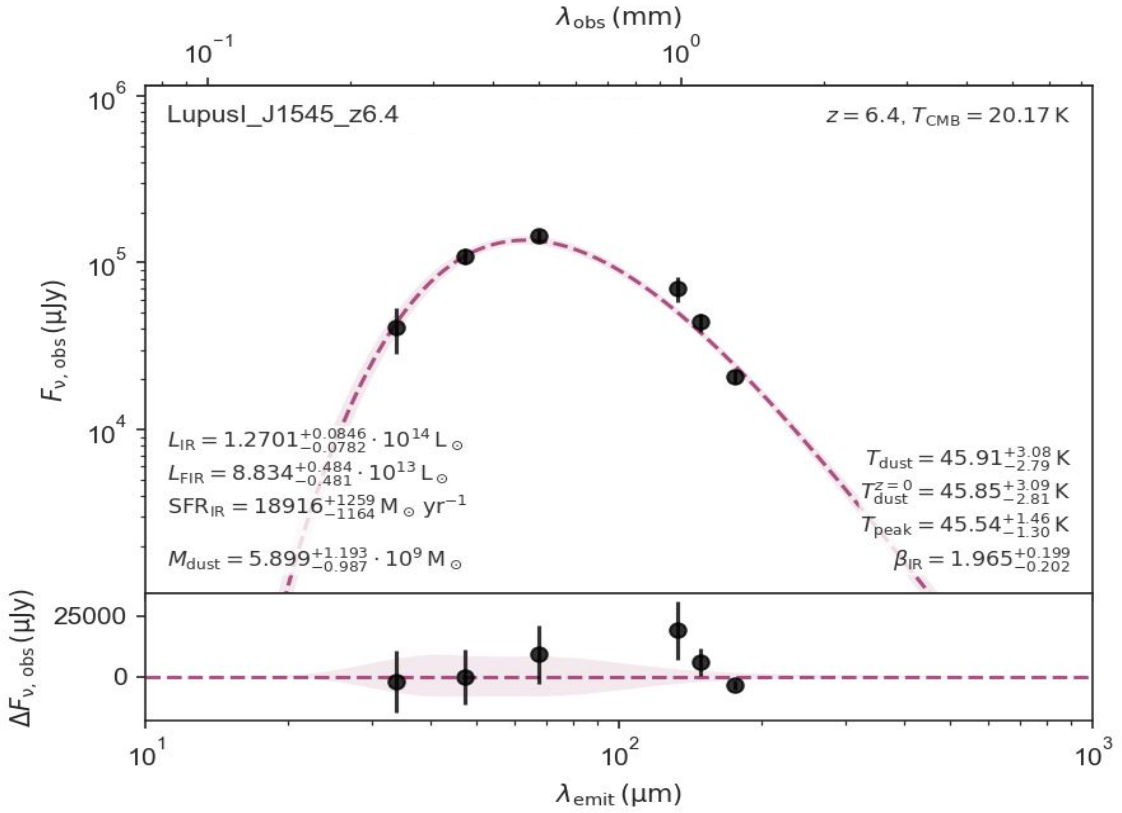
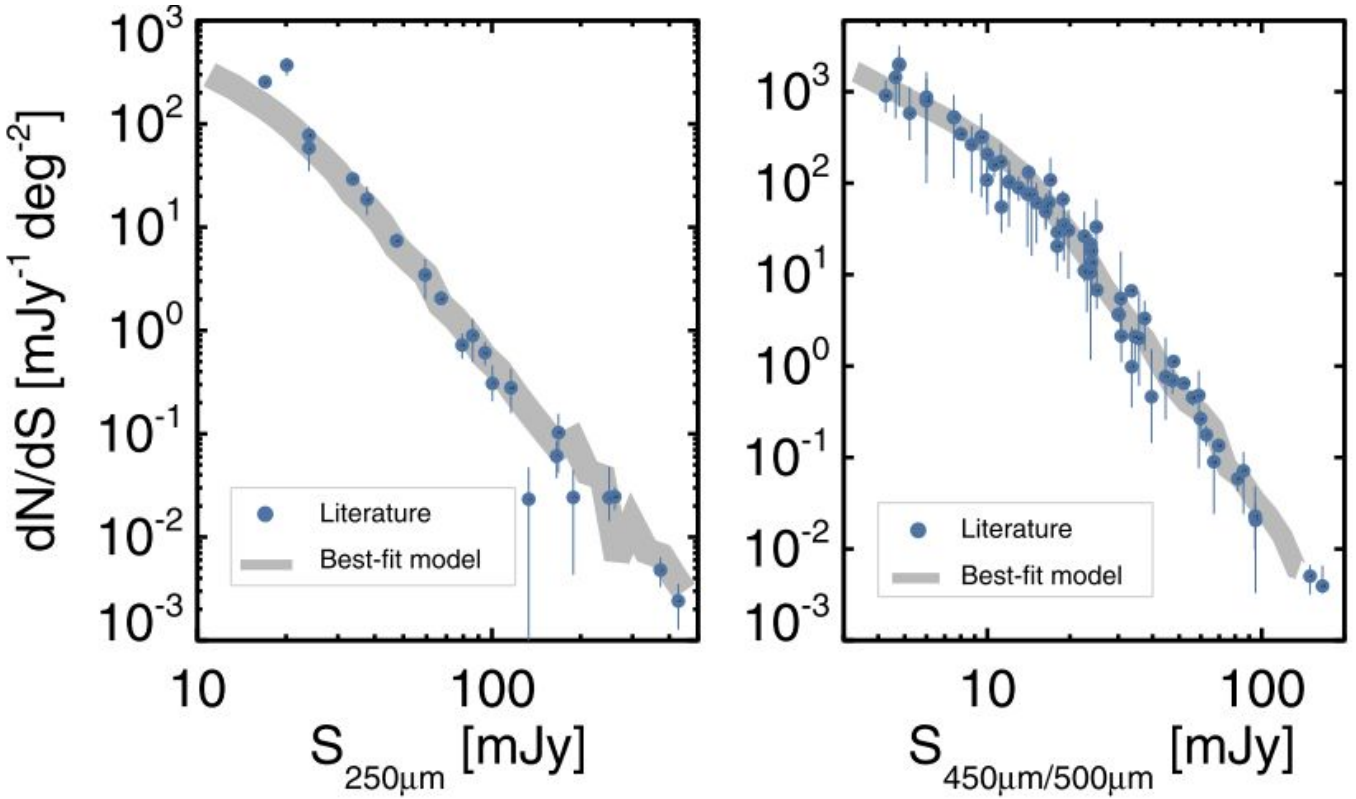


Limitations: scarcity

Zavala +21

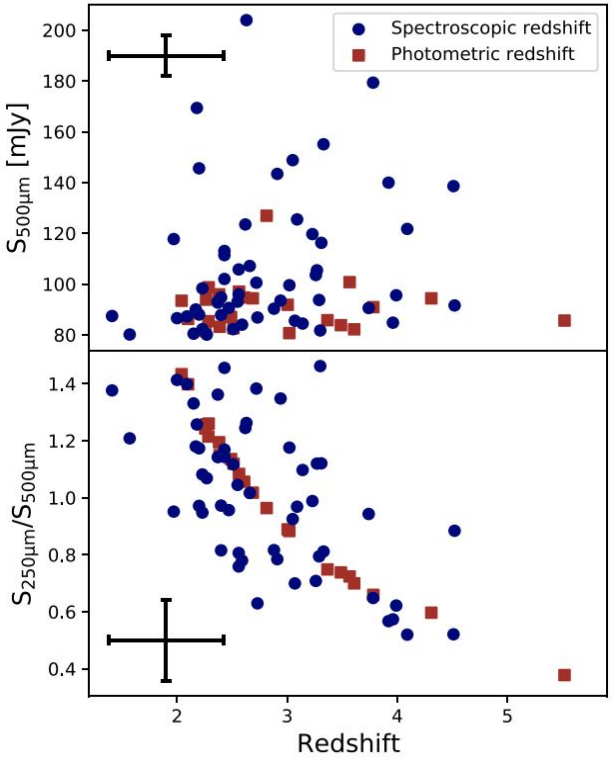


Way out: larger volumes

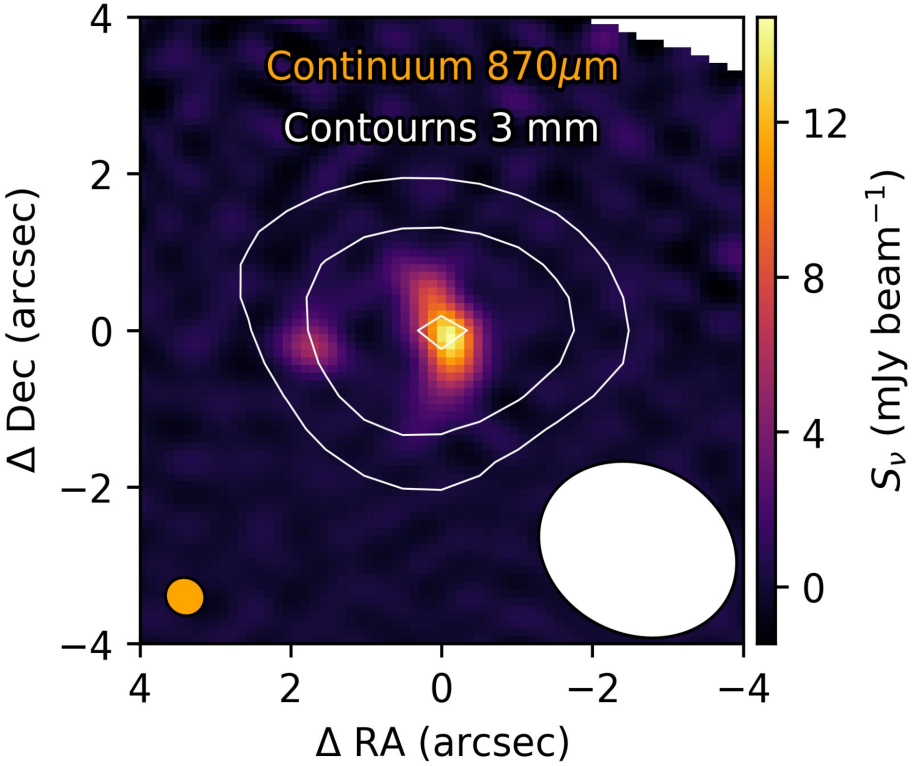
BEARS sample

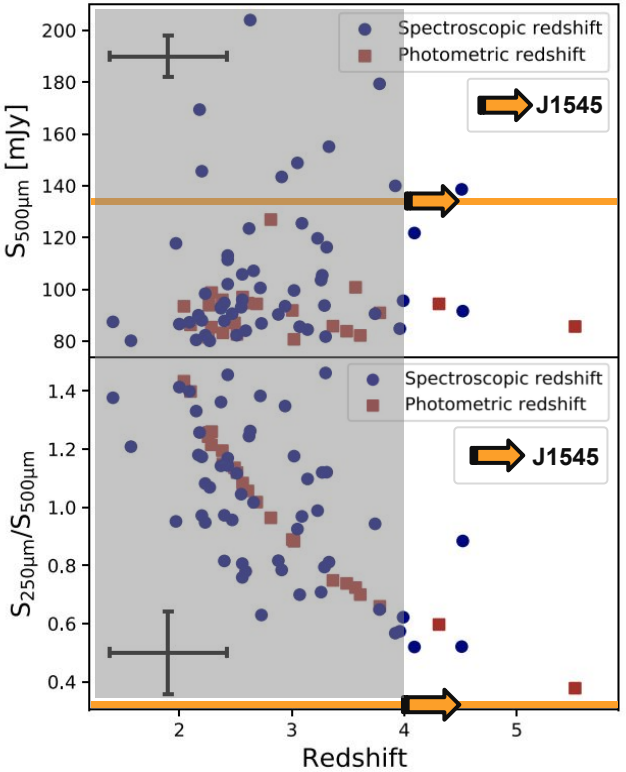
Urquhart +22

- **H-ATLAS survey**
  - ~70 brightest sub-mm sources
  - S_{500um} > 80 mJy
  - 1.41<z<4.53 (ALMA, NOEMA)



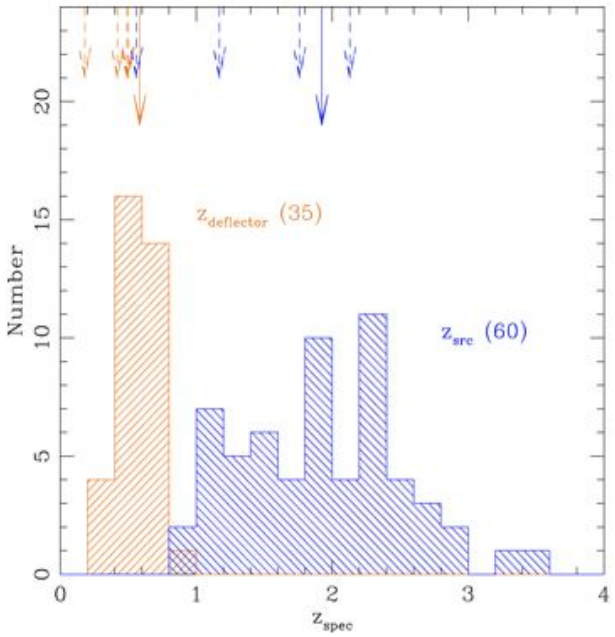
Bright strongly lensed galaxies

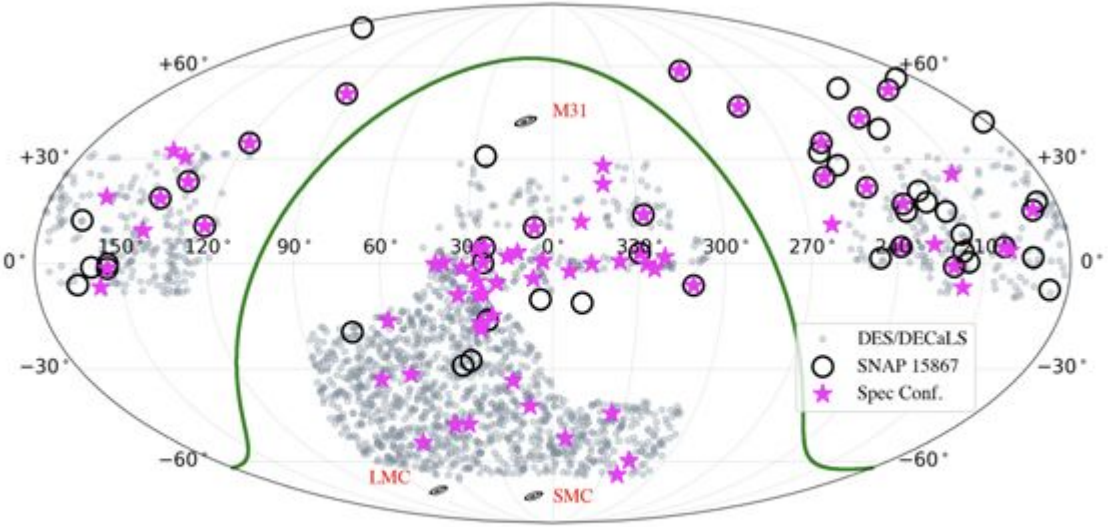




Way out: larger volumes

Tran +22

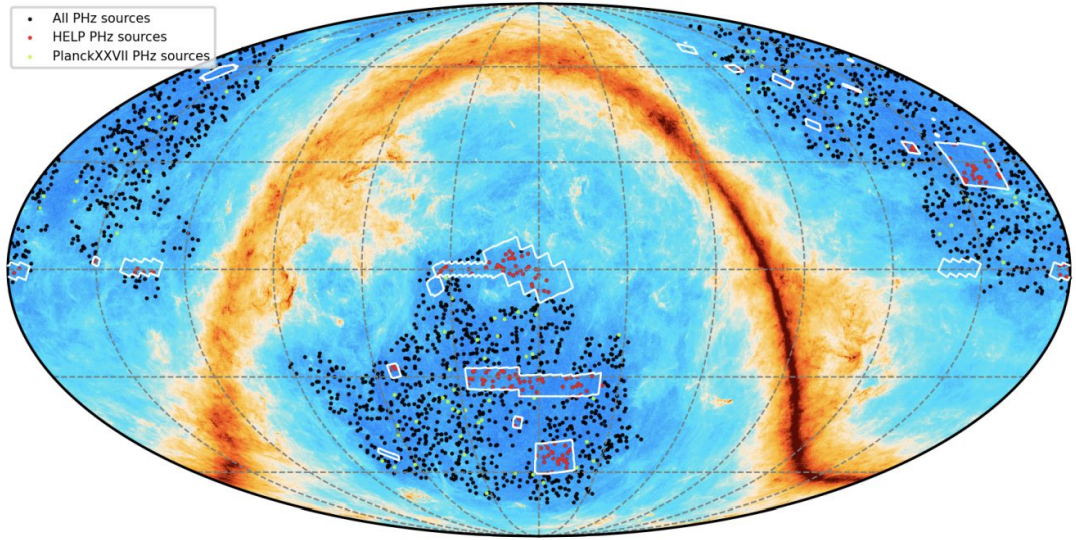




Way out: larger volumes

- **PHz cataloguelank All-Sky survey (2151 sources)**
  - <1% = lensed (from a sample of 187)

Lamers +22



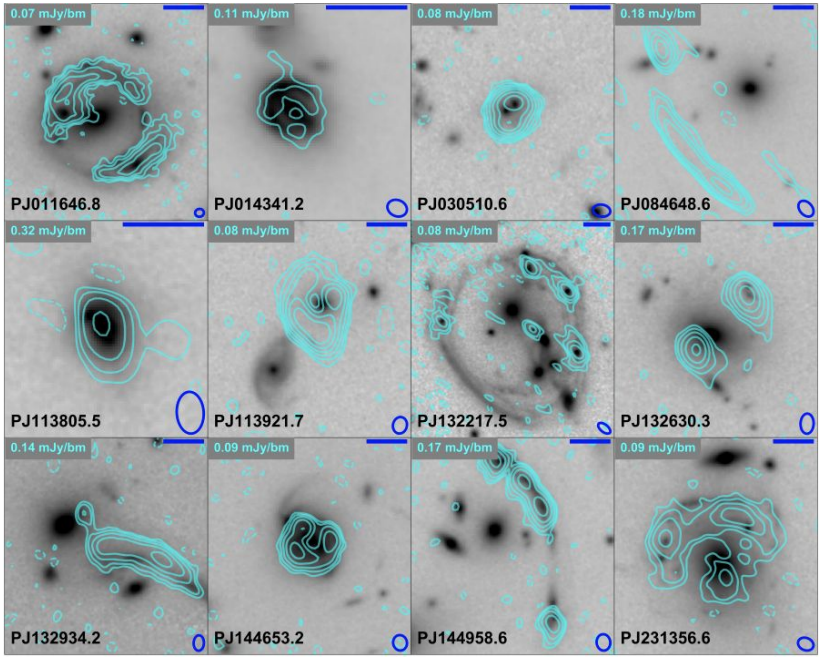
Bright strongly lensed galaxies

PASSAGES

Extremely luminous high-redshift galaxies identified by Planck

Berman +22

- **Plank All-Sky survey**
  - Planck Catalogue of Compact Sources
  - DSFGs at cosmic noon and beyond
  - Some of the **brightest and rarest** objects in the sky
    - ~ 1.2 x10^{14} L$\odot$
  - Redshift confirmed through follow up
    - LMT, SMA, ALMA
    - 31 confirmed, z<4 [peak at z~2.5]
    - Lens: followed up with MUSE



Bright strongly lensed galaxies

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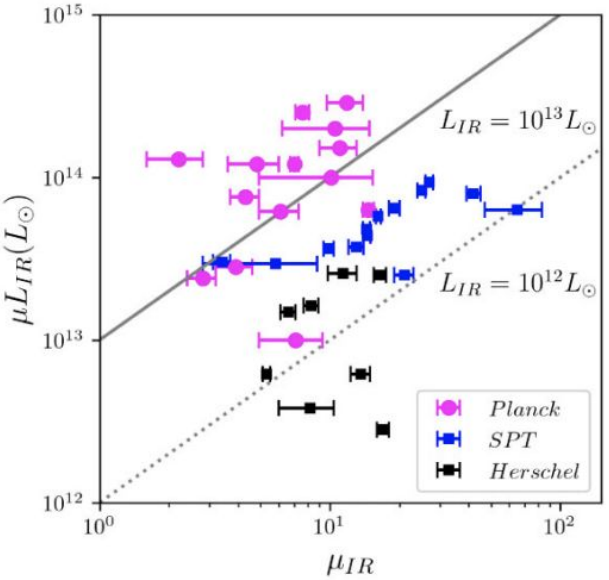
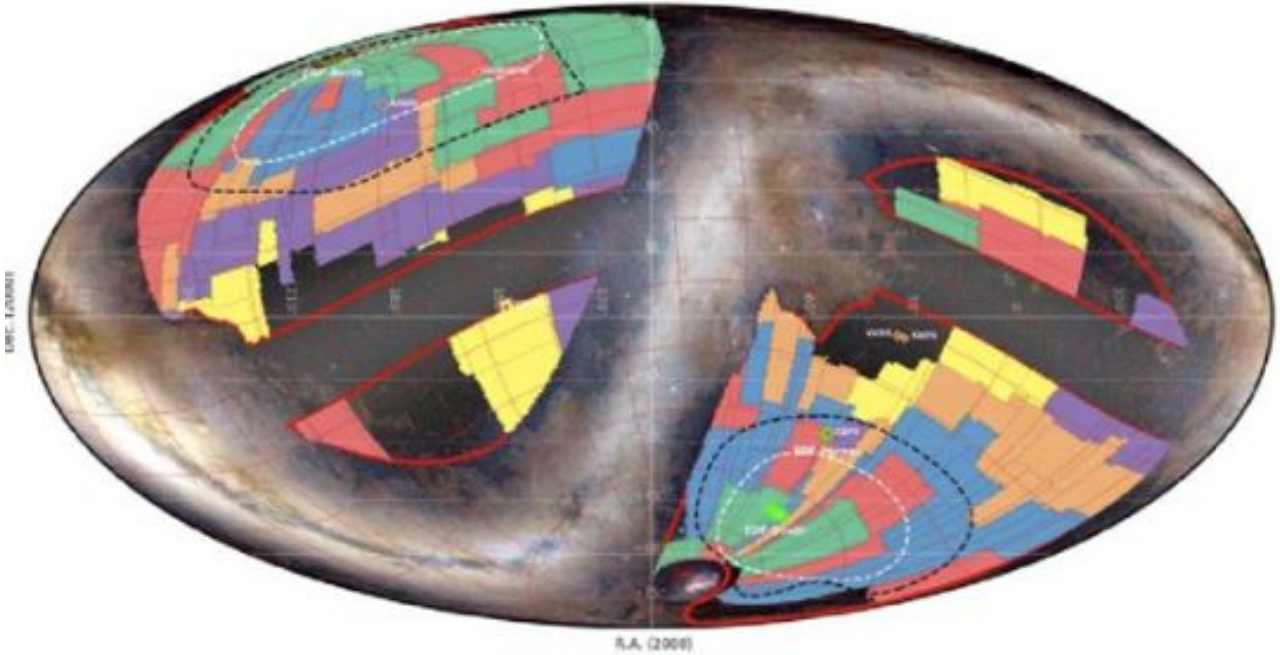
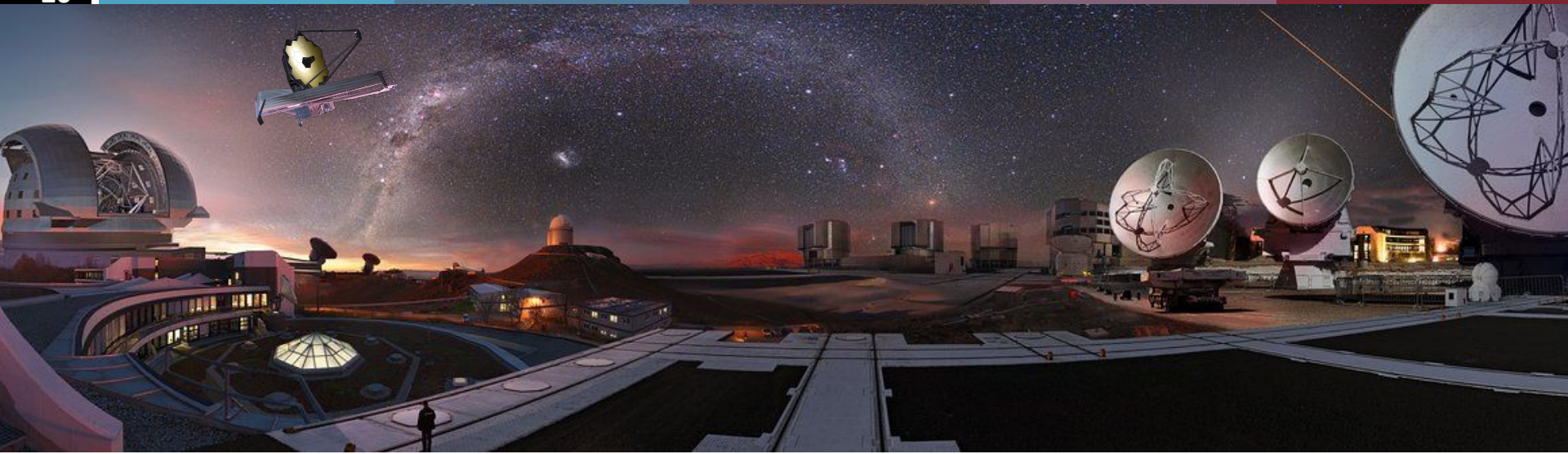


Way out: larger volumes



Synergy: ESO



ELT VLT ALMA


THANK YOU!