



HerS

HeLMS

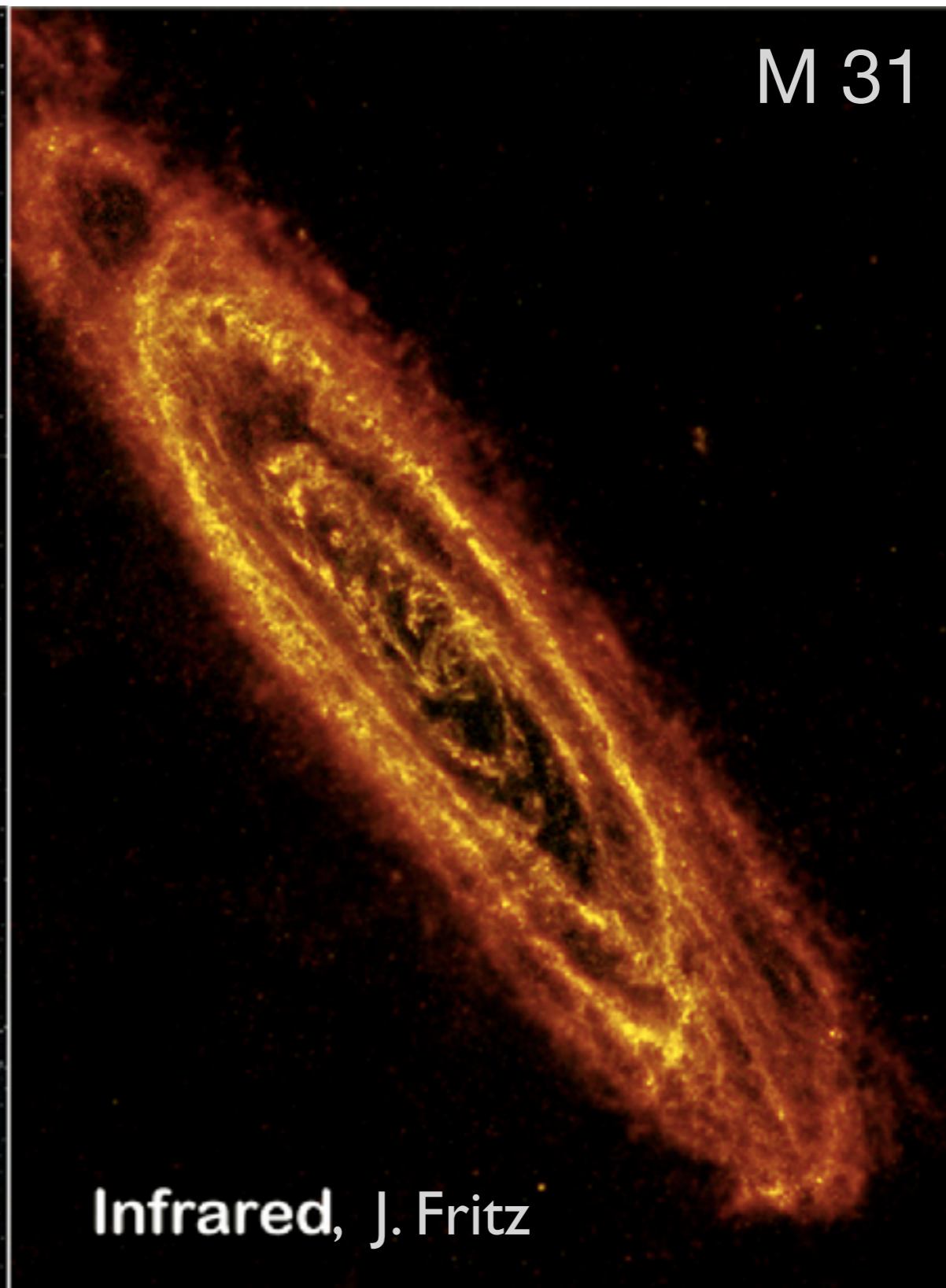
**HerS and HeLMS:
Herschel/SPIRE Submillimeter
surveys in the SDSS Stripe 82**

Marco Viero - Caltech

M 31



Optical, R. Gendle

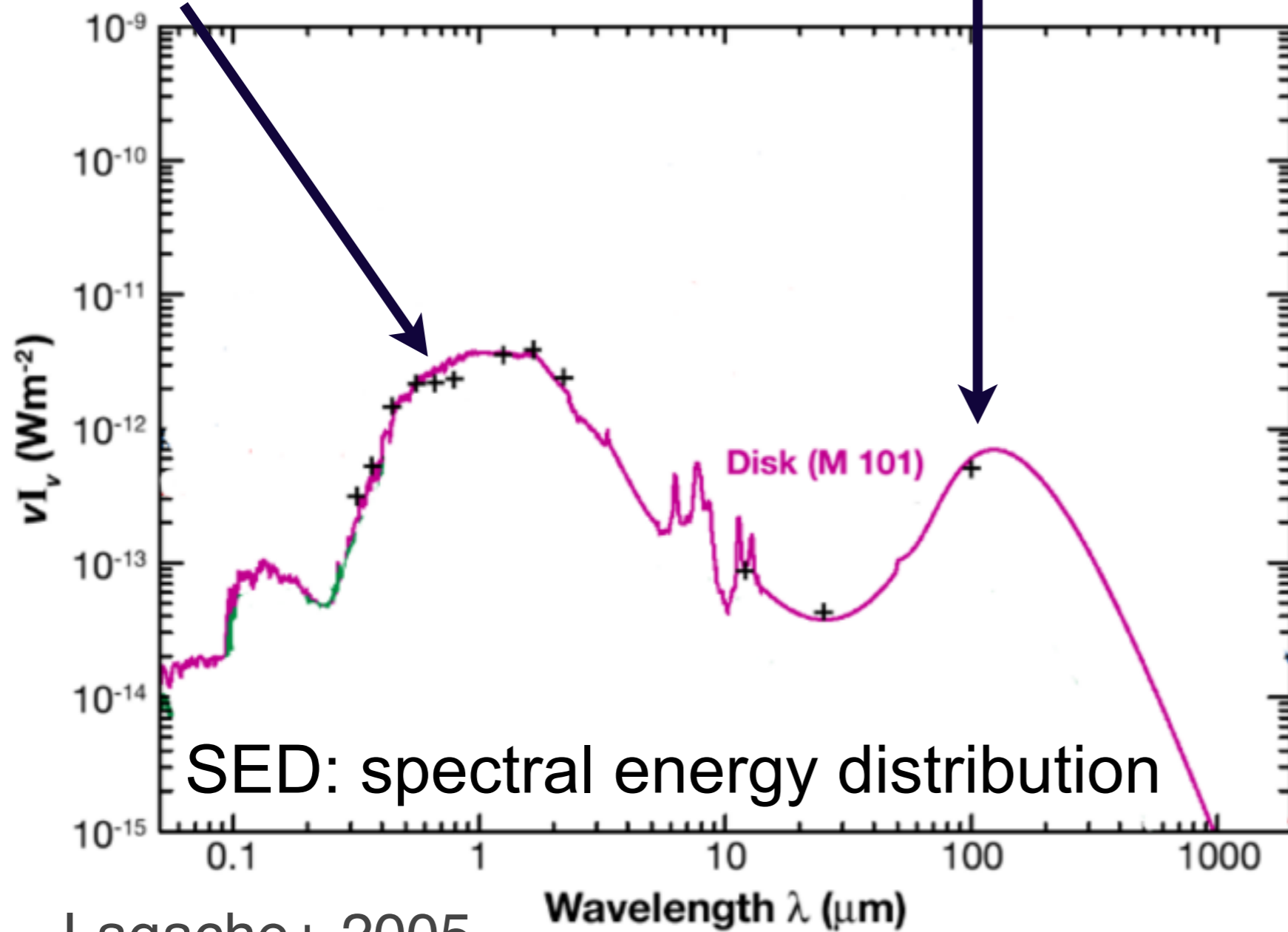


Infrared, J. Fritz

far-infrared/submillimeter:
dust warmed by stars

Dust re-emits in the FIR

Optical/UV Starlight absorbed by dust



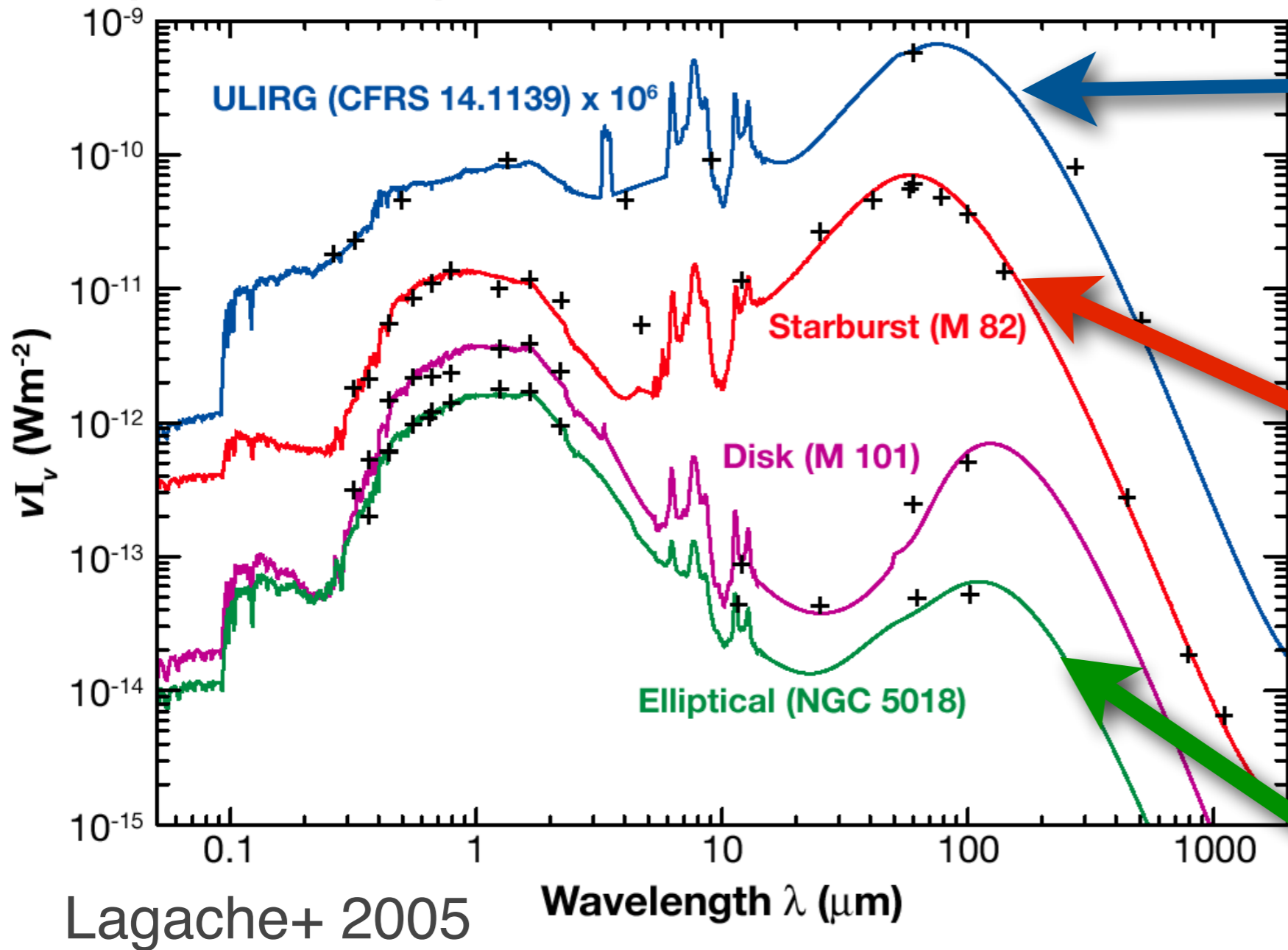
SED: spectral energy distribution

Lagache+ 2005

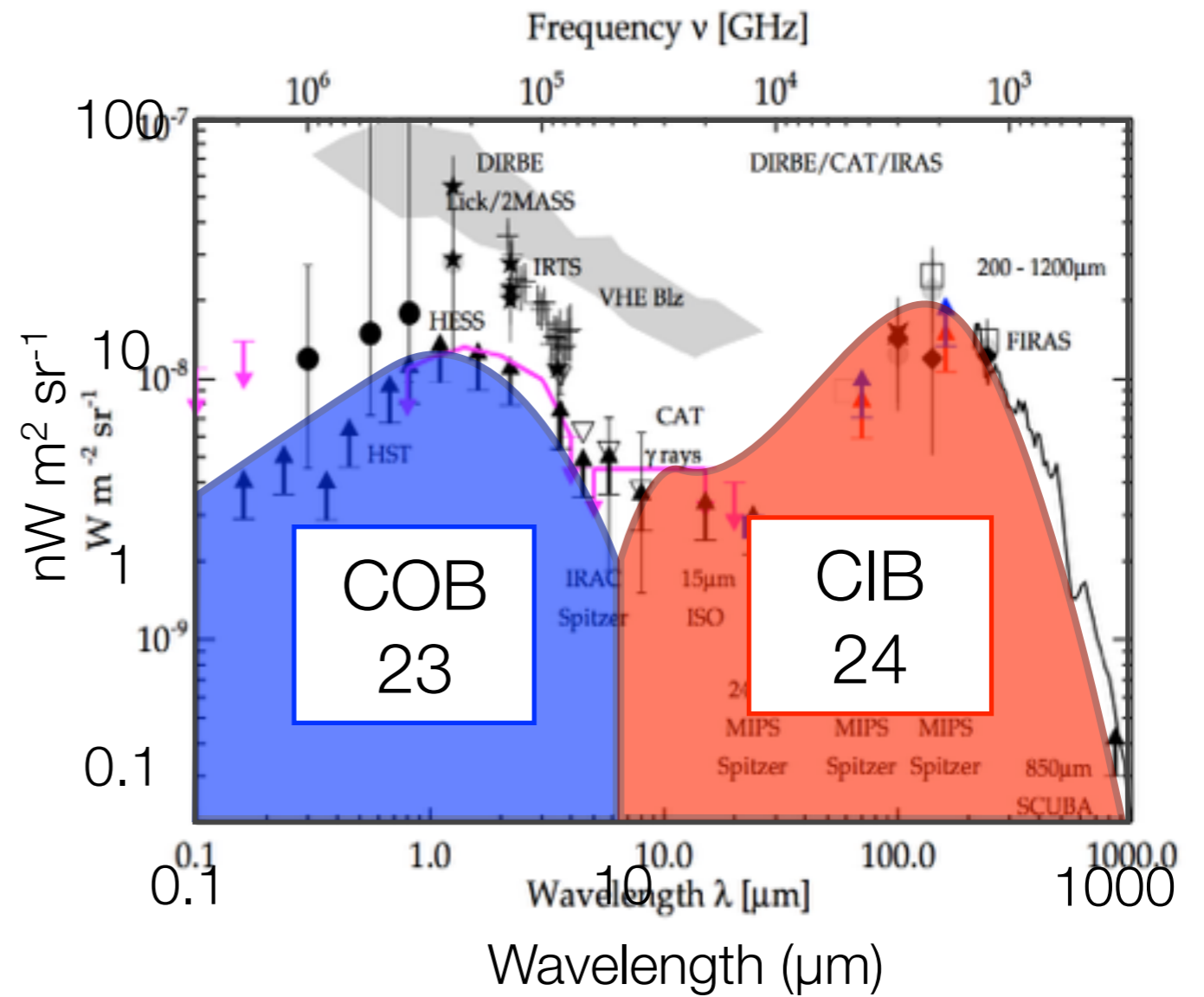


UV/Optical and FIR/submm SED

Dusty Star-Forming Galaxies (DSFGs)

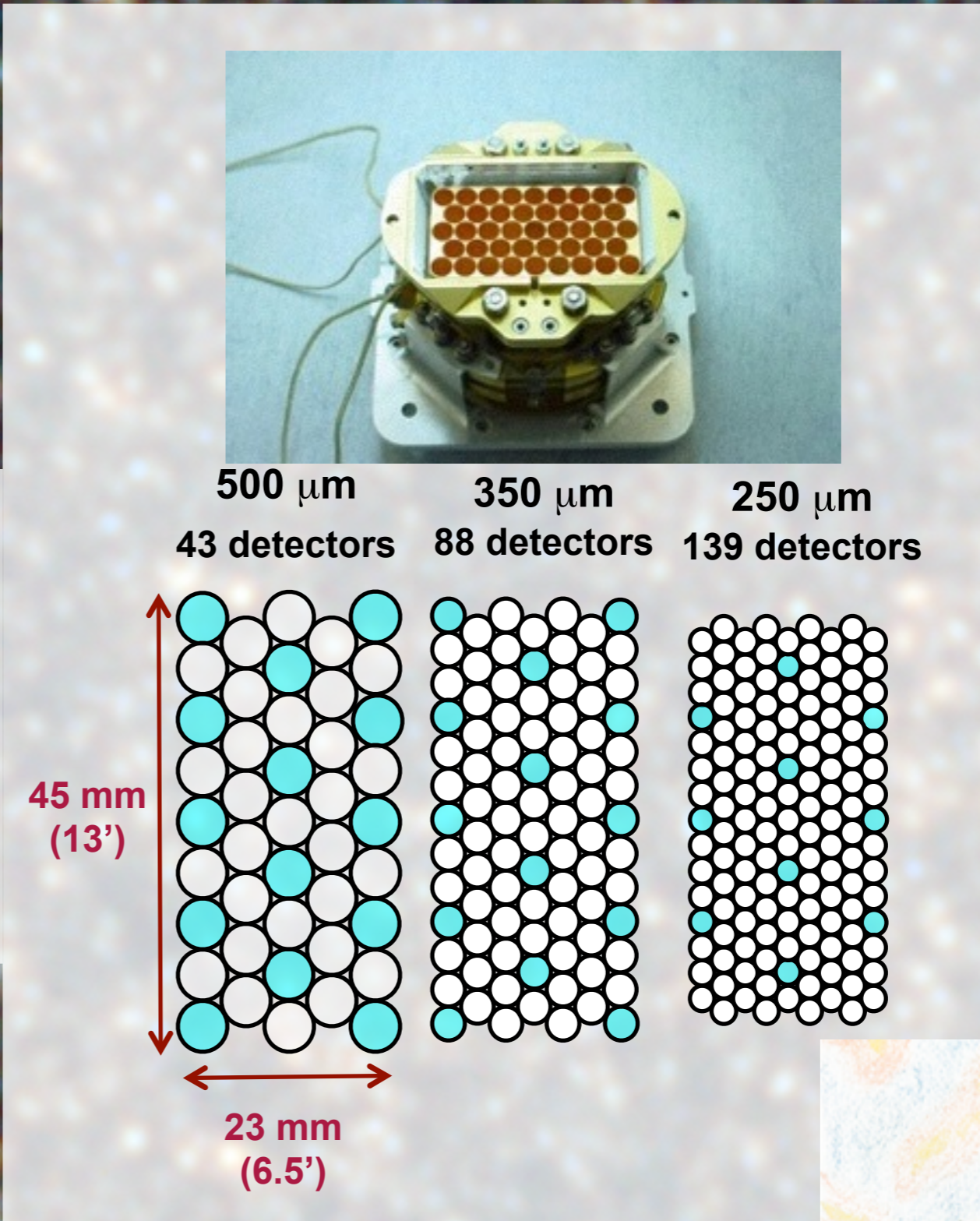
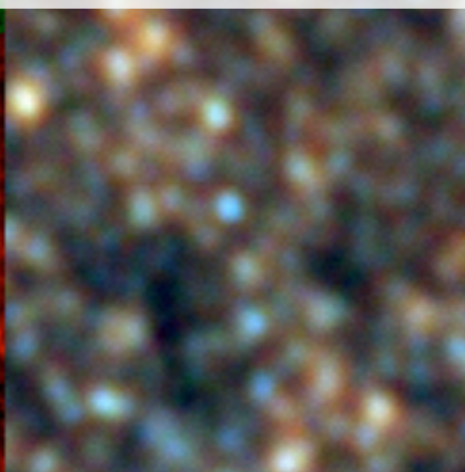
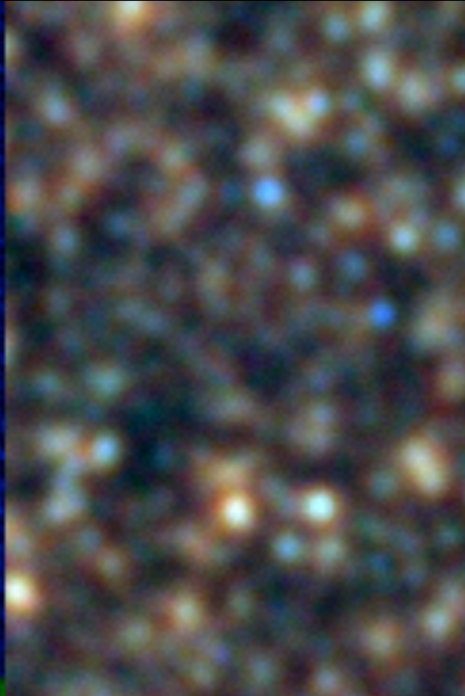
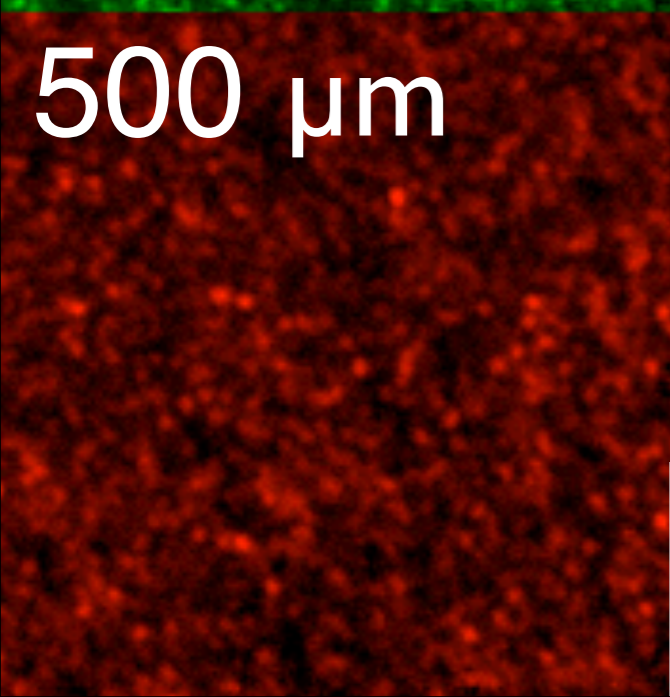
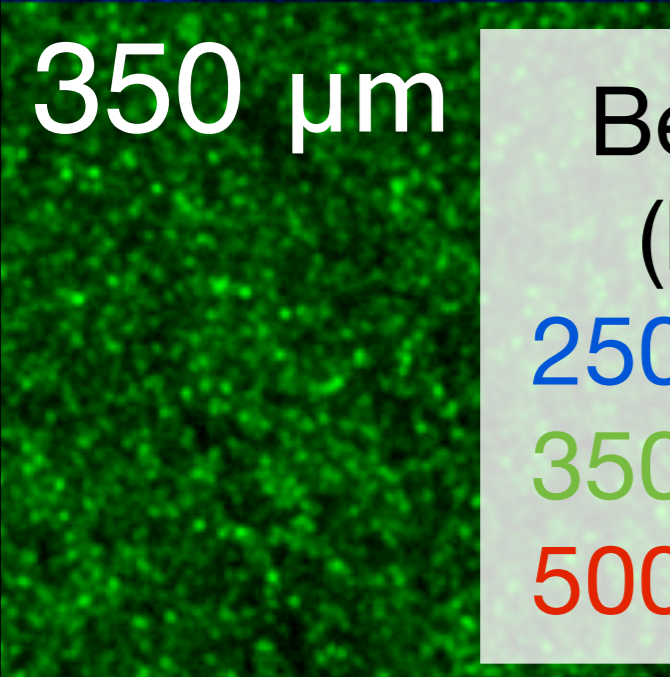
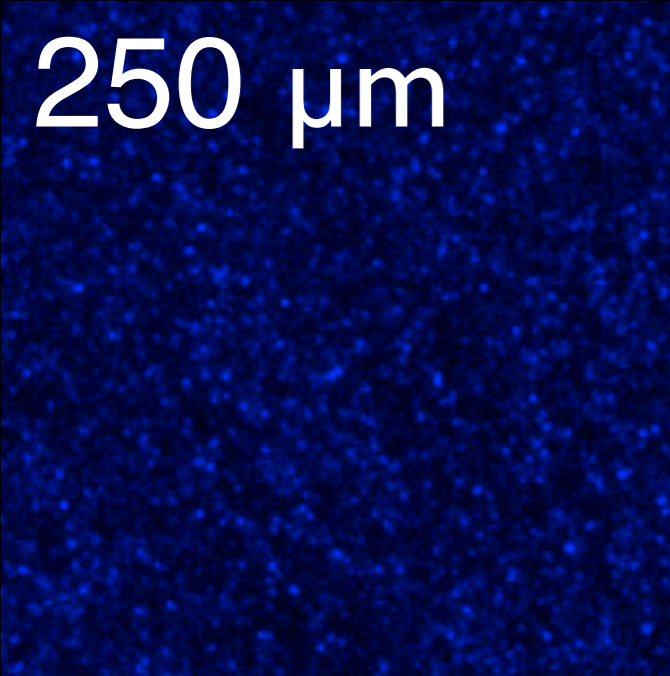


Optical and FIR SED



Dole+ (2006)

optical and infrared backgrounds



Beam size
(FWHM)

250 μm - 16"

350 μm - 25"

500 μm - 36"

Herschel/SPIRE



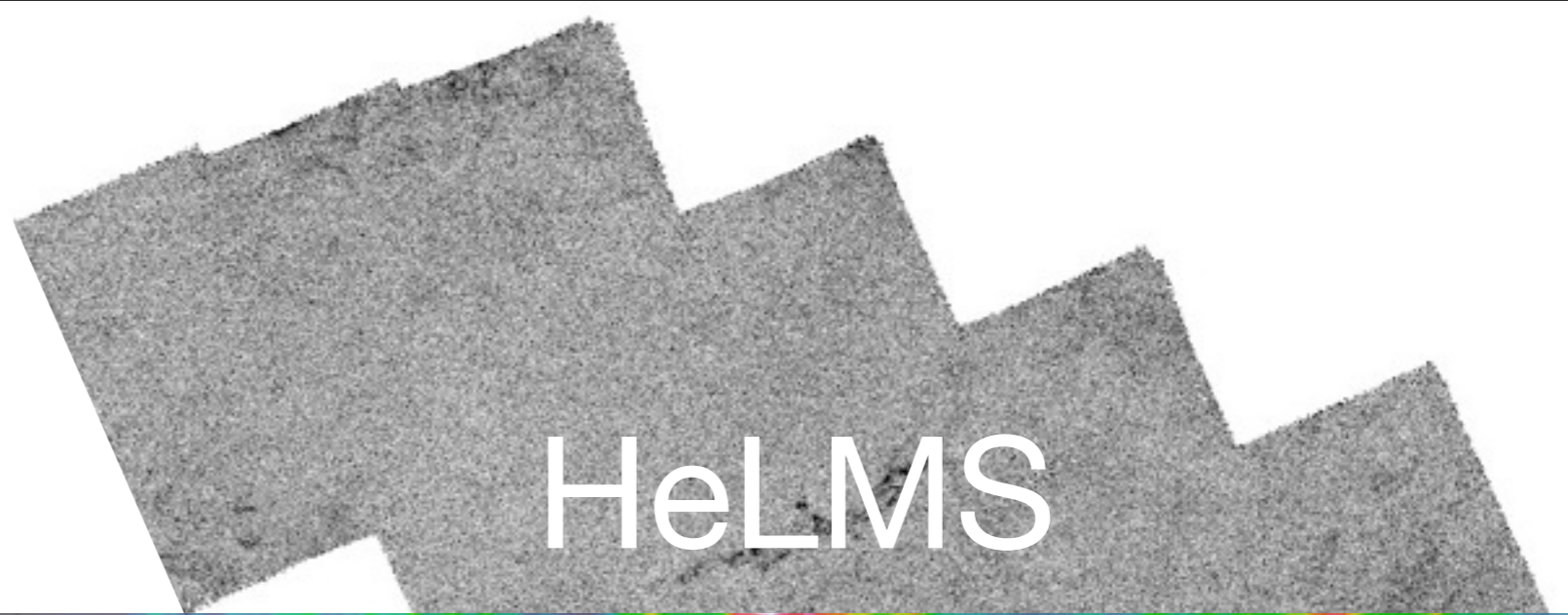
ACT HERMES

SHELA

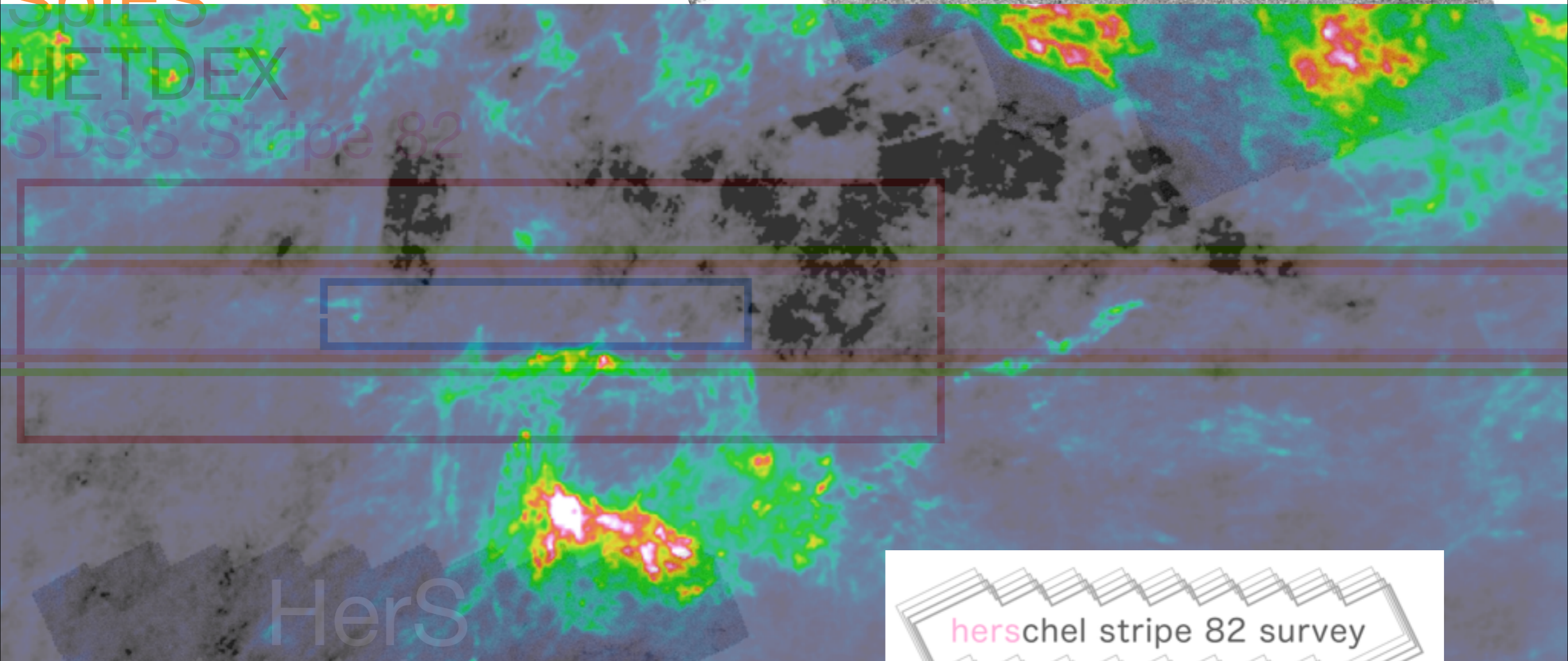
SpIES

HETDEX

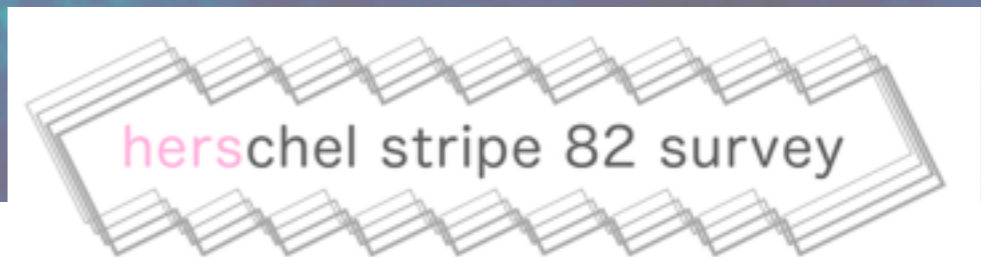
SDSS Stripe 82



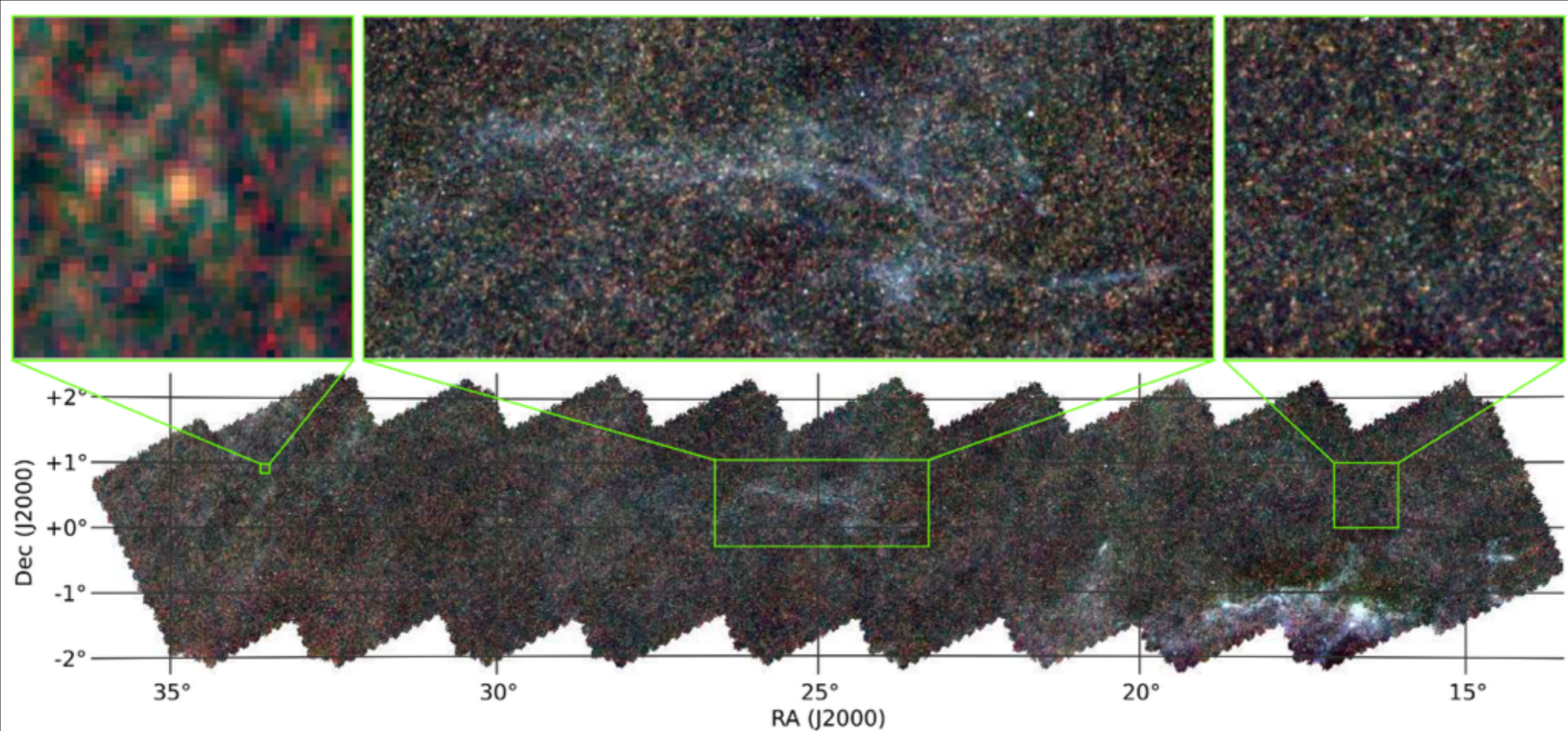
HeLMS



HerS



herchel stripe 82 survey

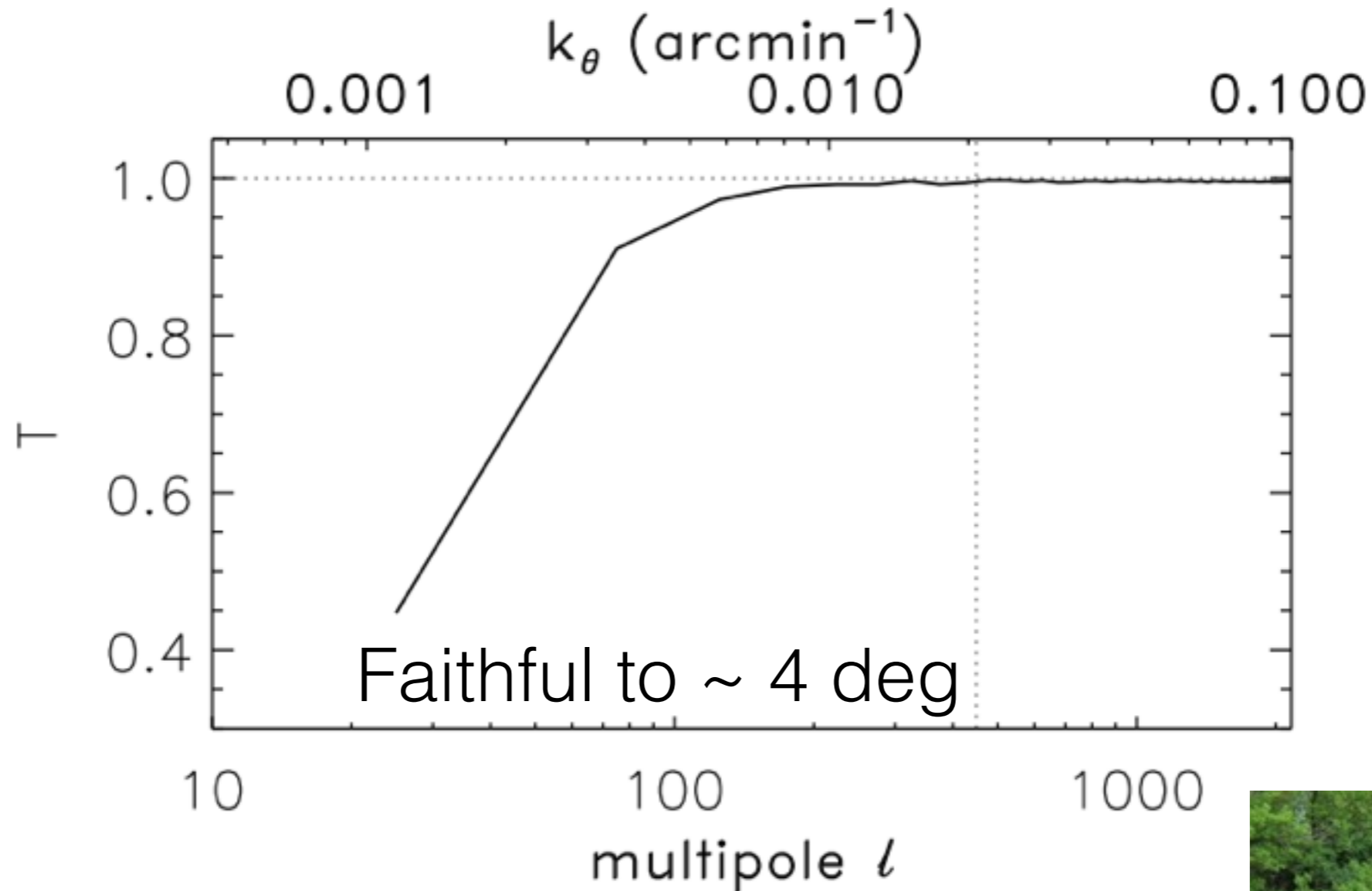


- HerS - 70 deg² (~20 deg along S82)
- HeLMS - 280 deg² (~25 deg along S82)

SANEPIC maps made by Viktoria Asboth (UBC) and the SMAP team.



Transfer Function



SANEPIC maps made by Viktoria Asboth (UBC) and the SMAP team.





Viero+ 2014
arXiv:1308.4399



Oliver+ 2012
arXiv:1203.2562

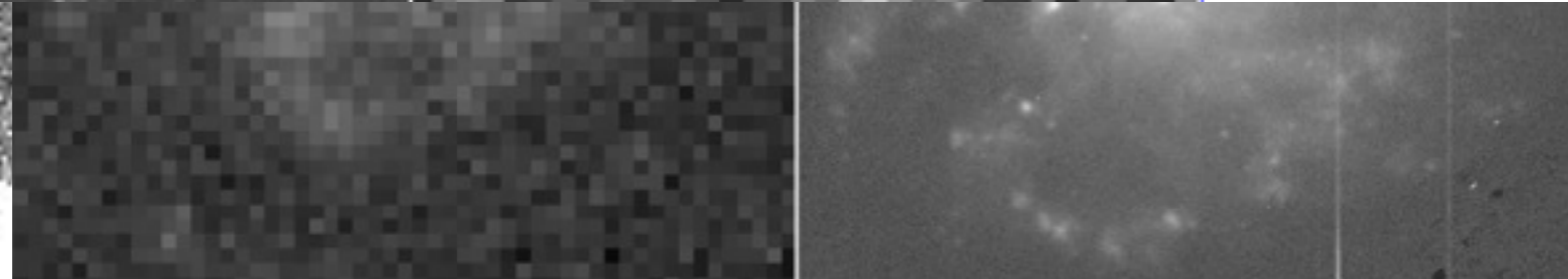
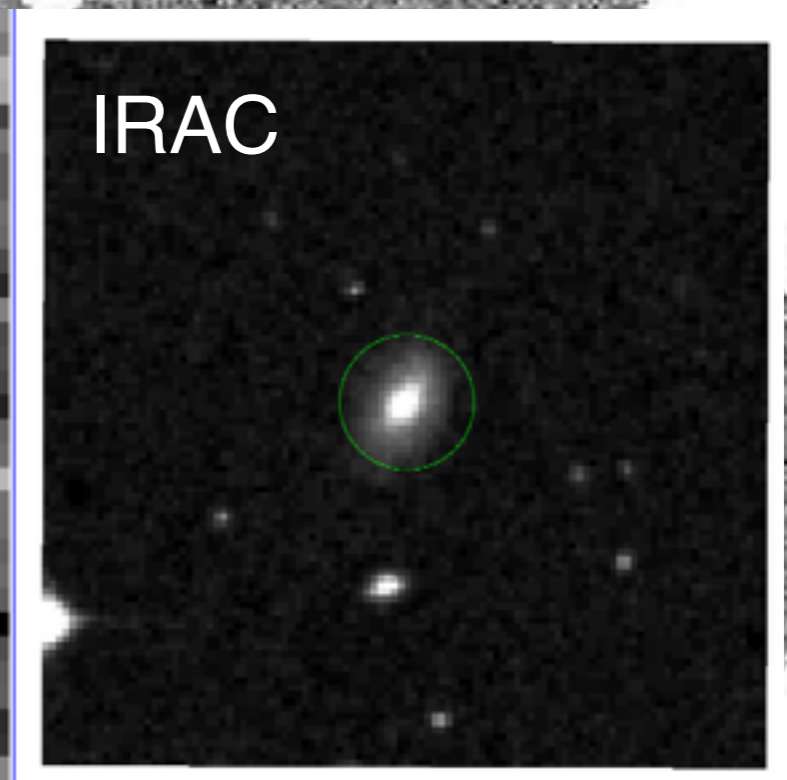
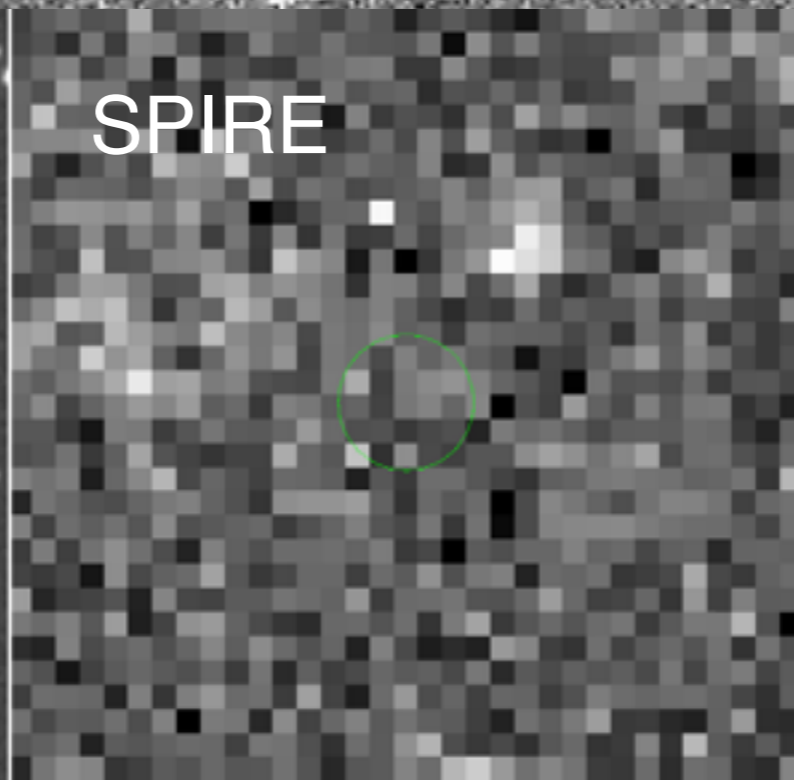
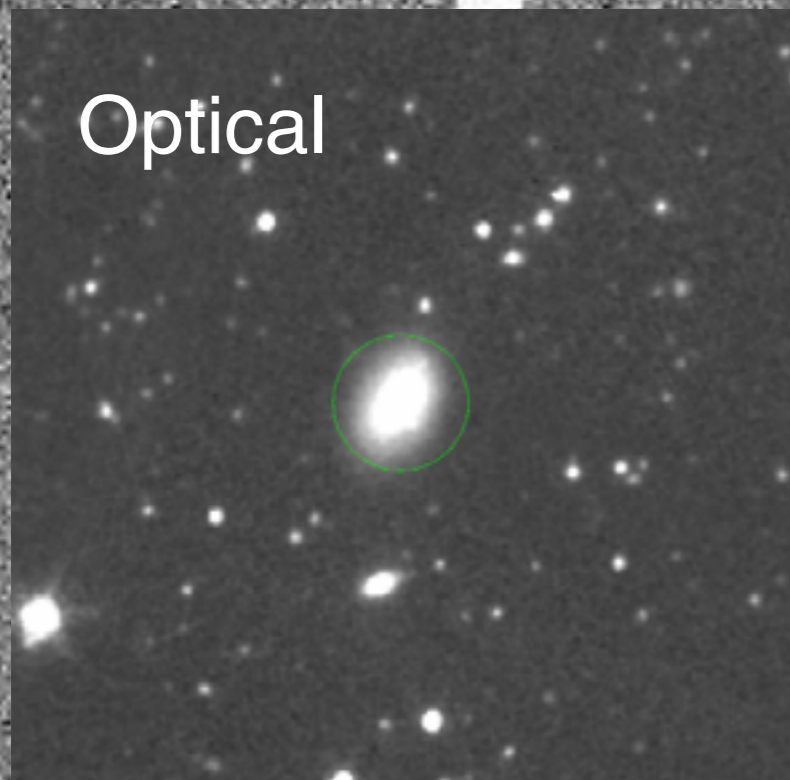


Find Maps/Catalogs at:

(available now!) <http://www.astro.caltech.edu/hers>

(coming in June) <http://hedam.lam.fr/HerMES/>

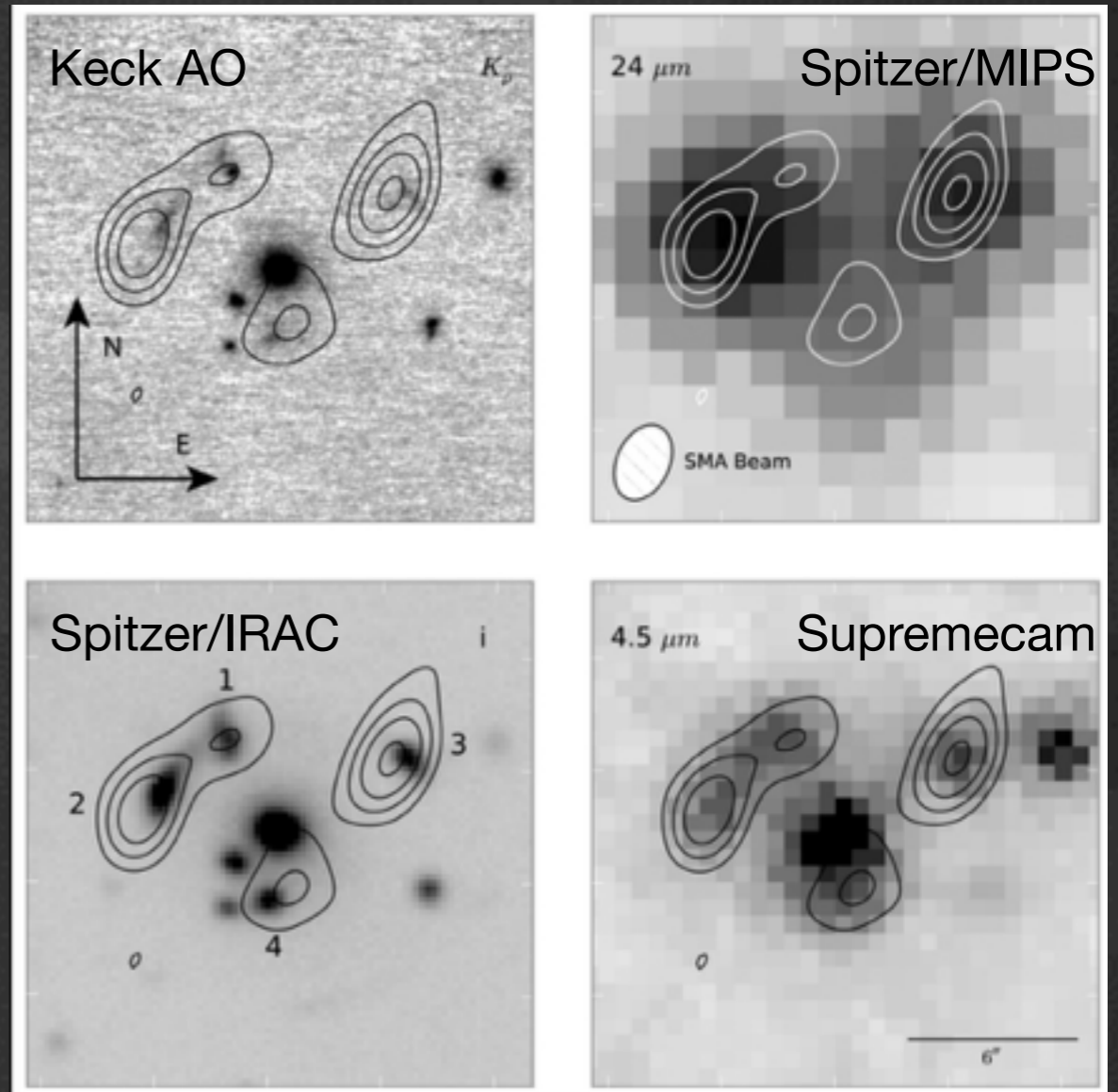
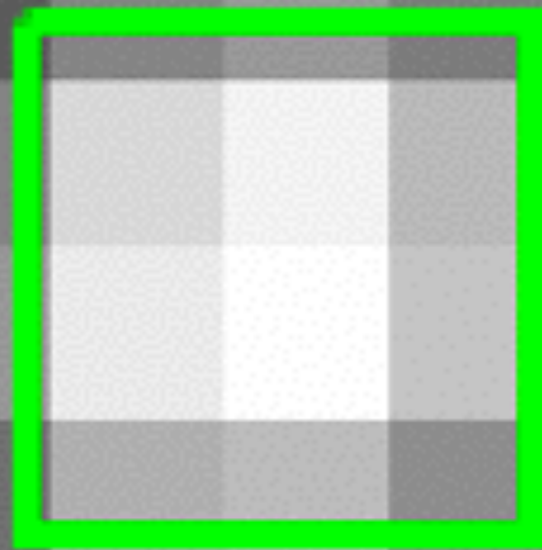
Local Galaxies



Lensed Sources

SPIRE 250 μ m (6" pixels)

$z=2.97$ from spectroscopic follow-up



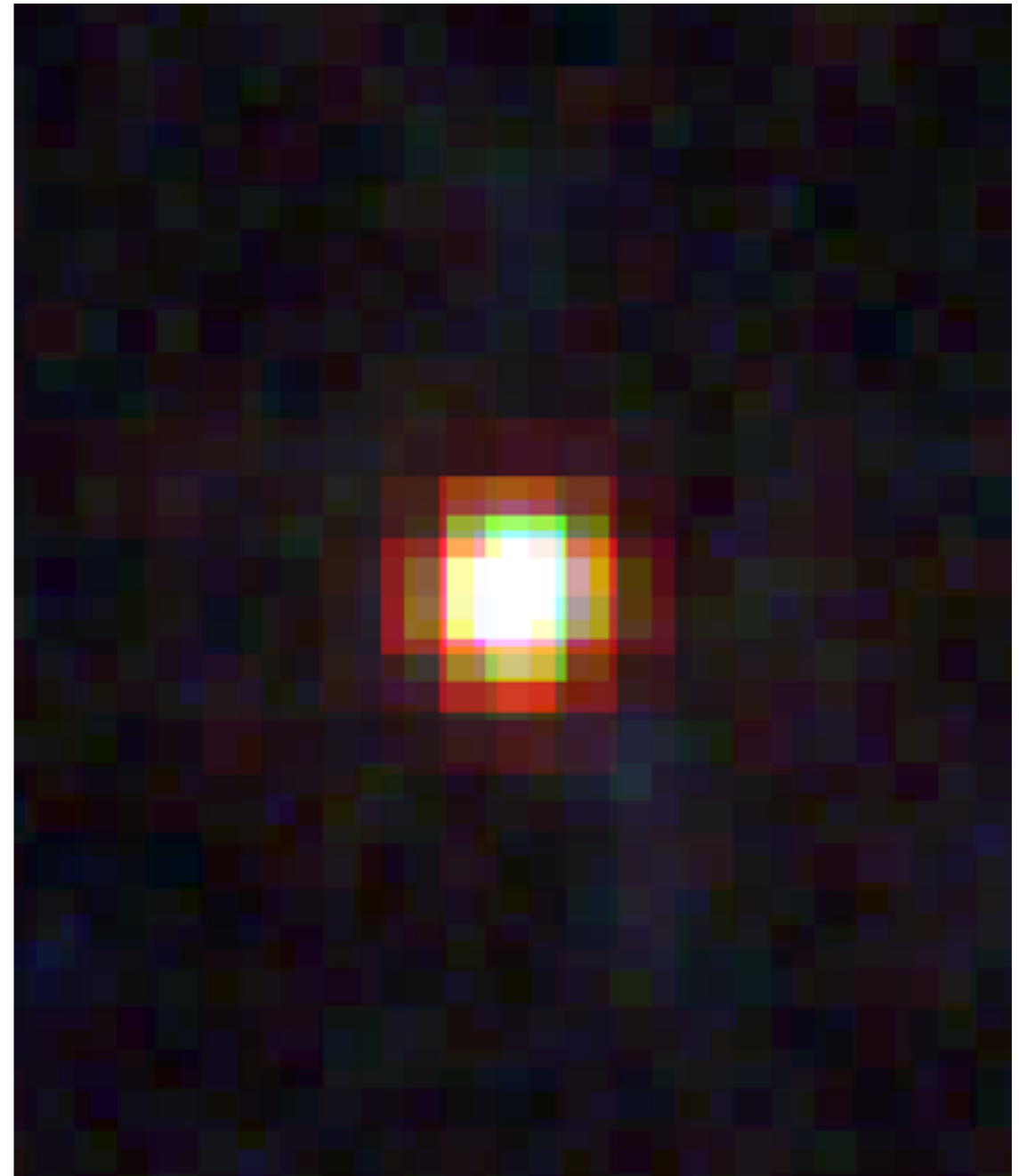
Contours From Submillimeter Array (SMA)

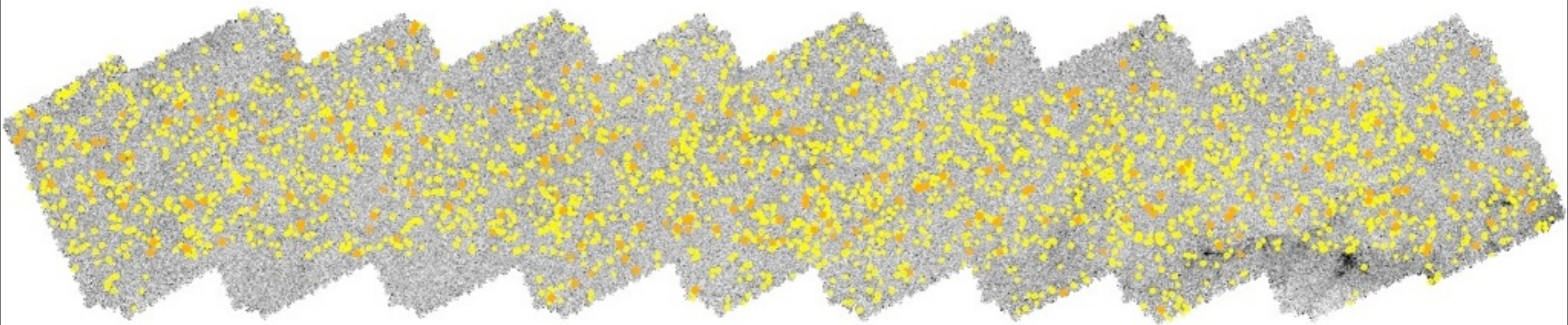
Conley et al. (2011)

also see: Vieira+ 2013, Gonzalez-Nuevo+ 2012, Wardlow+ 2012, Fu+ 2013

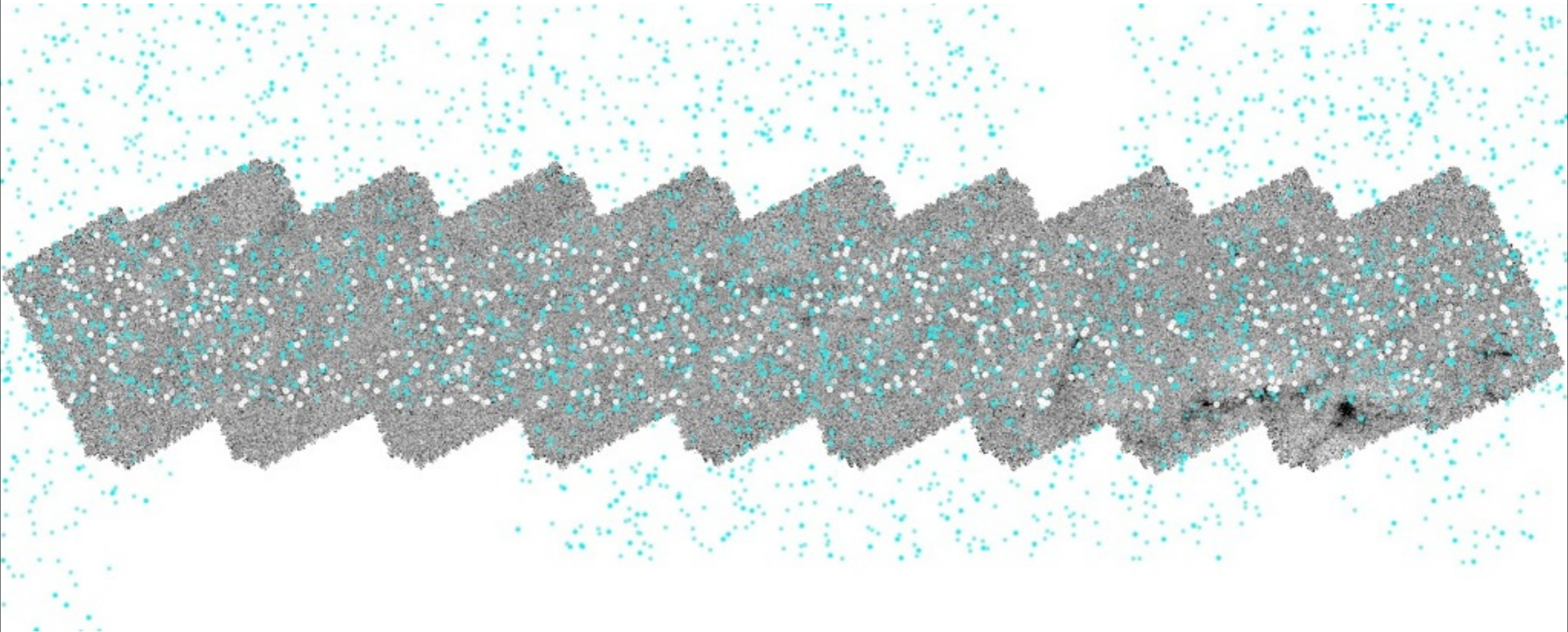
Citizen Science!

- SpaceWarps discovery (Jim Geach)
- Also part of HerS/ACT
GBT/Zspectrometer obs

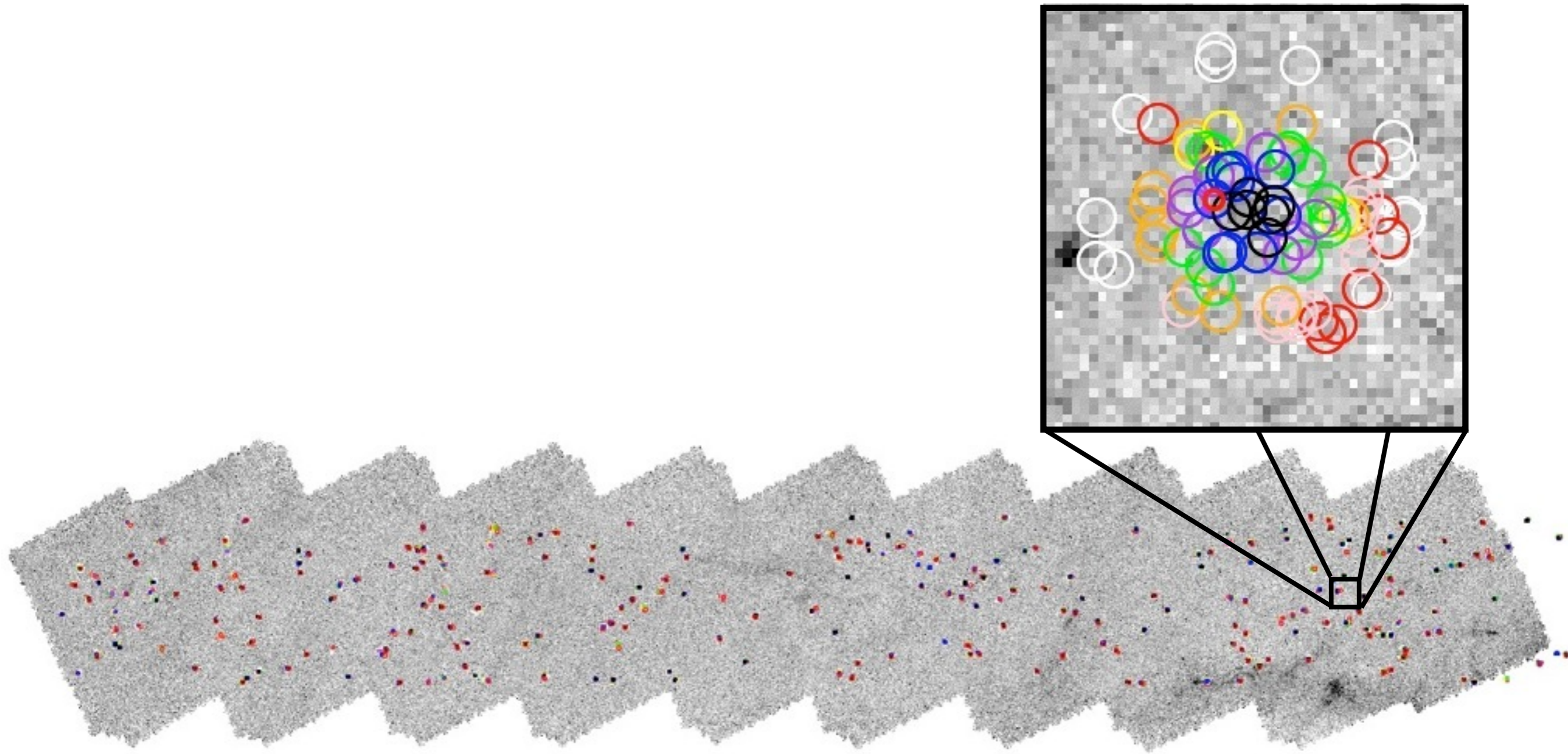




- BOSS QSOs
- DLAs



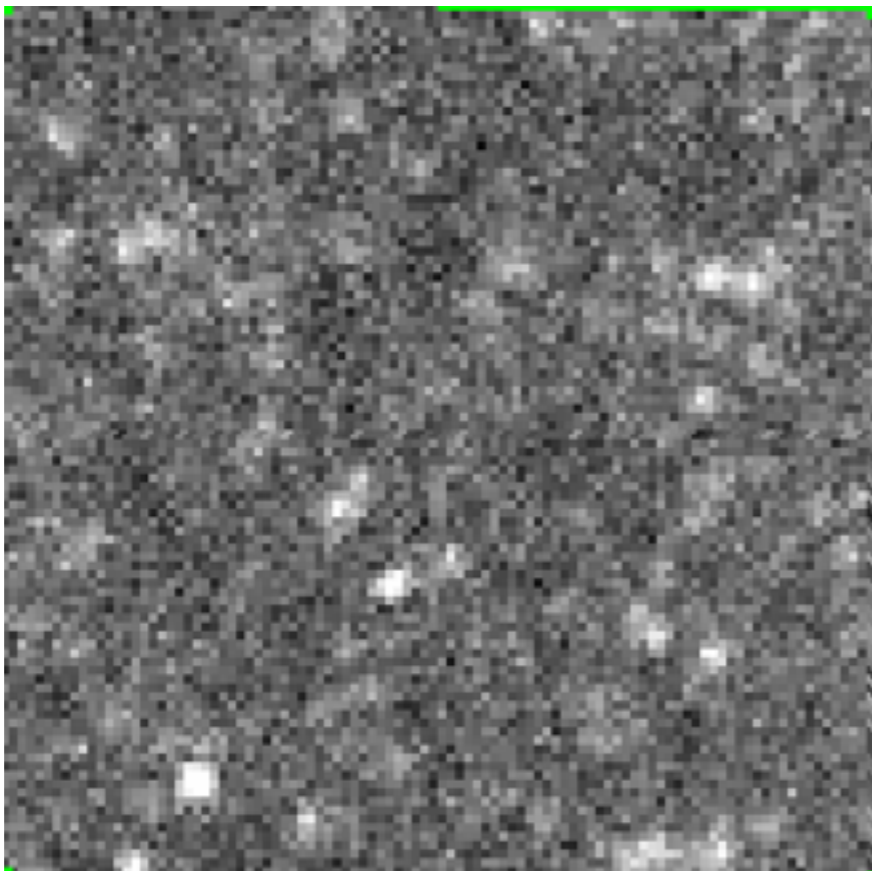
- Clusters (Geach et al. 2012)
- BOSS quasars



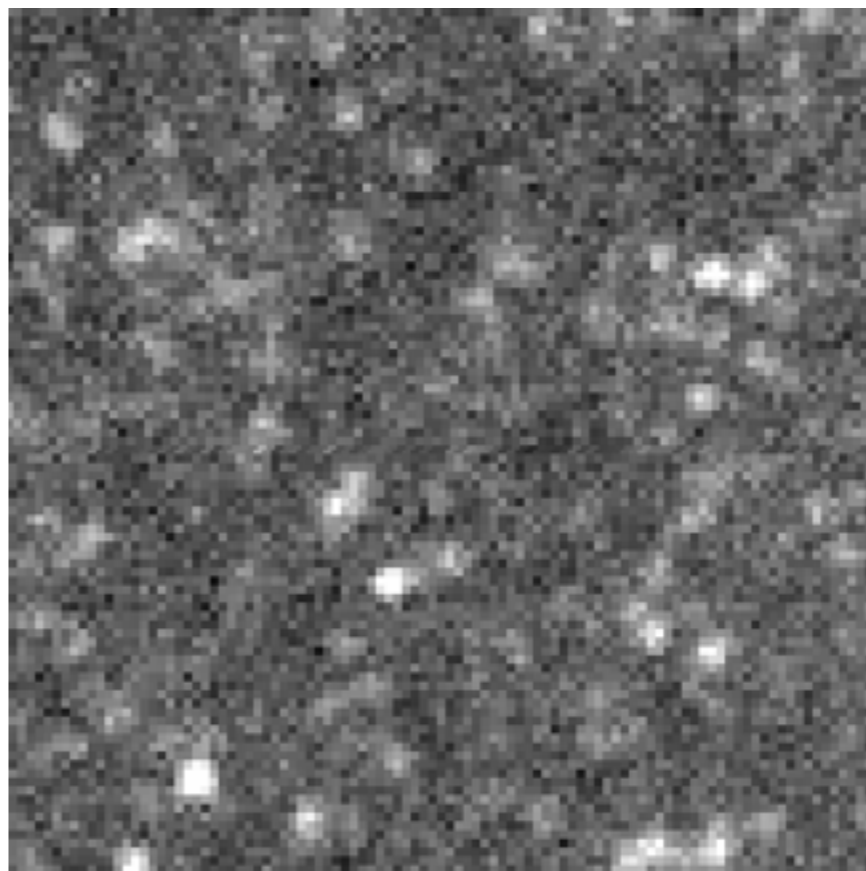
Cluster Members

Instrument Noise

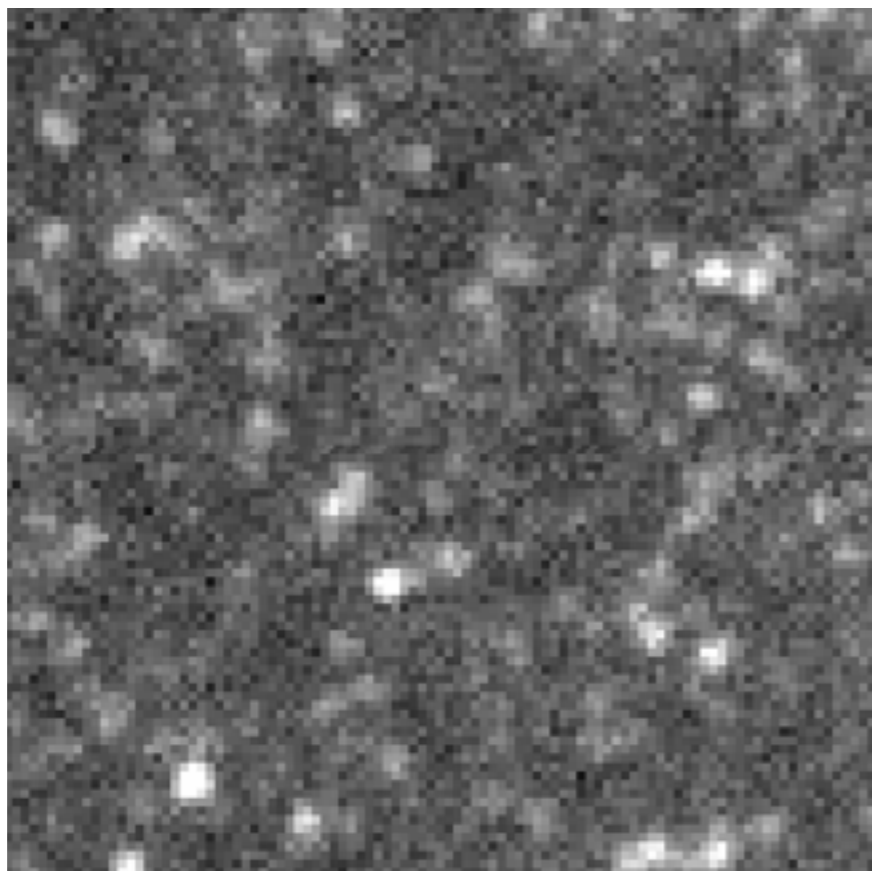
2 scans



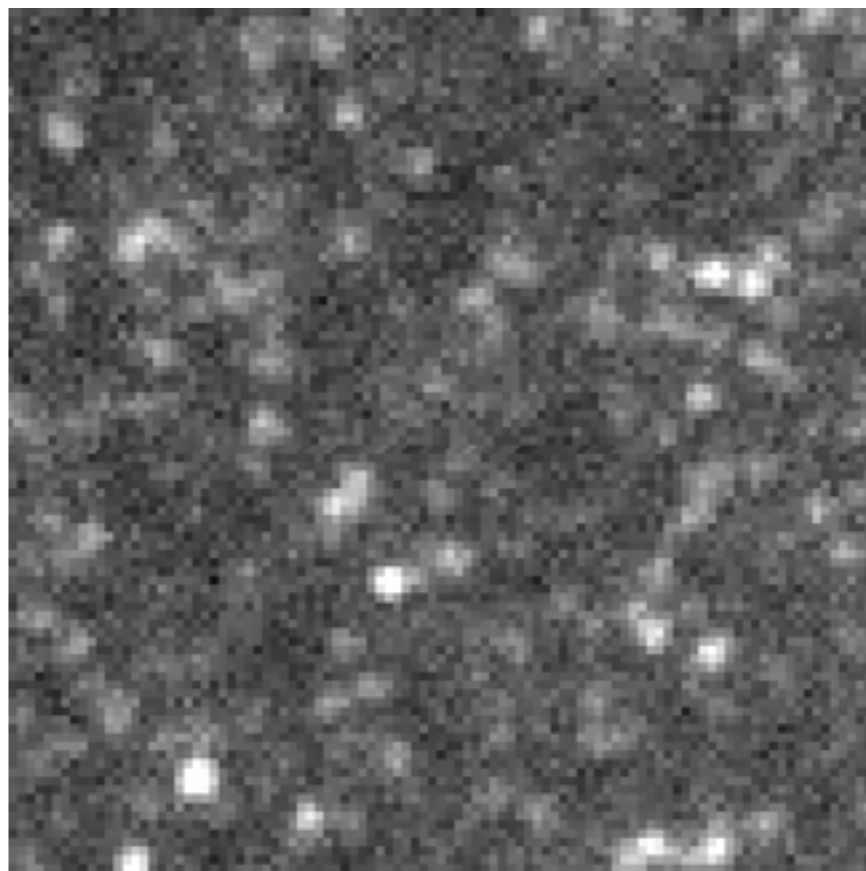
4 scans



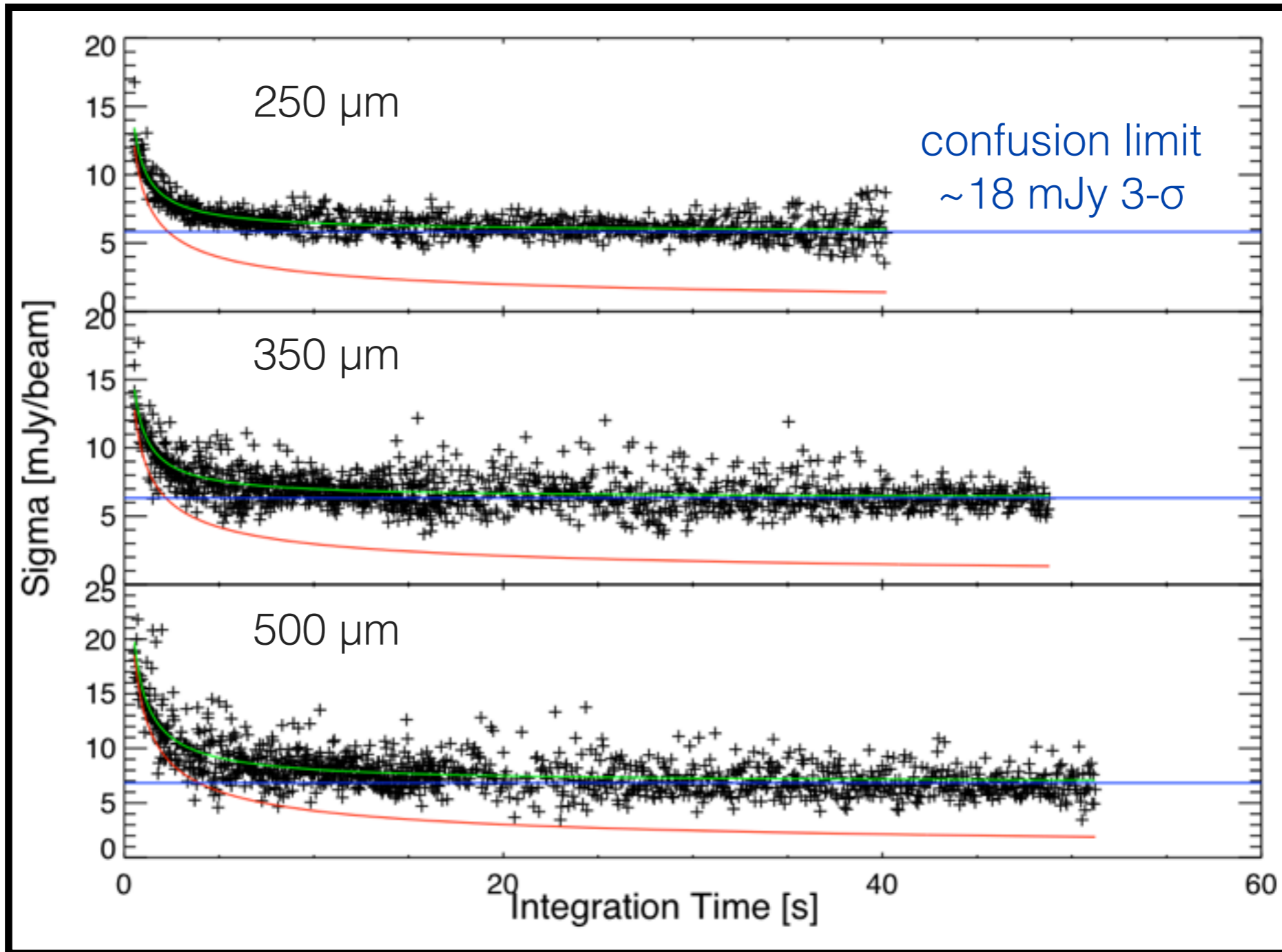
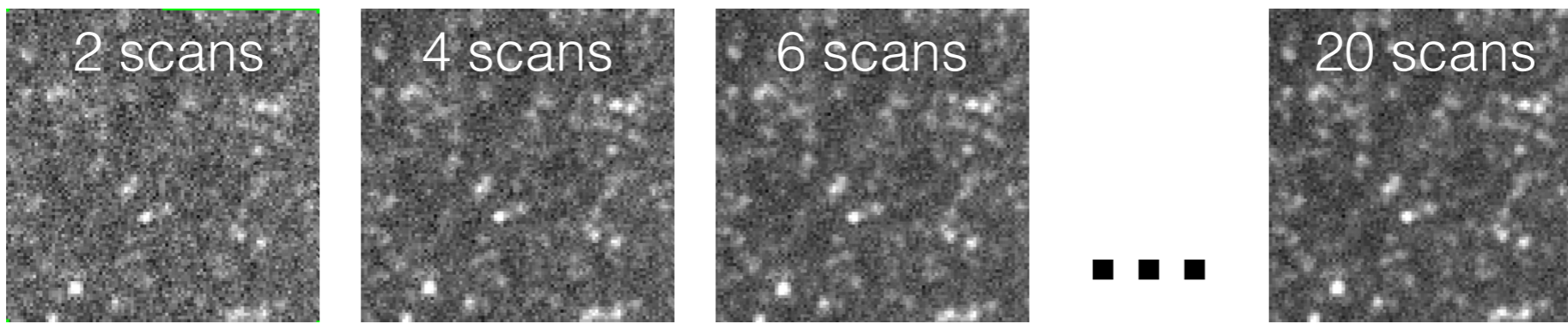
6 scans



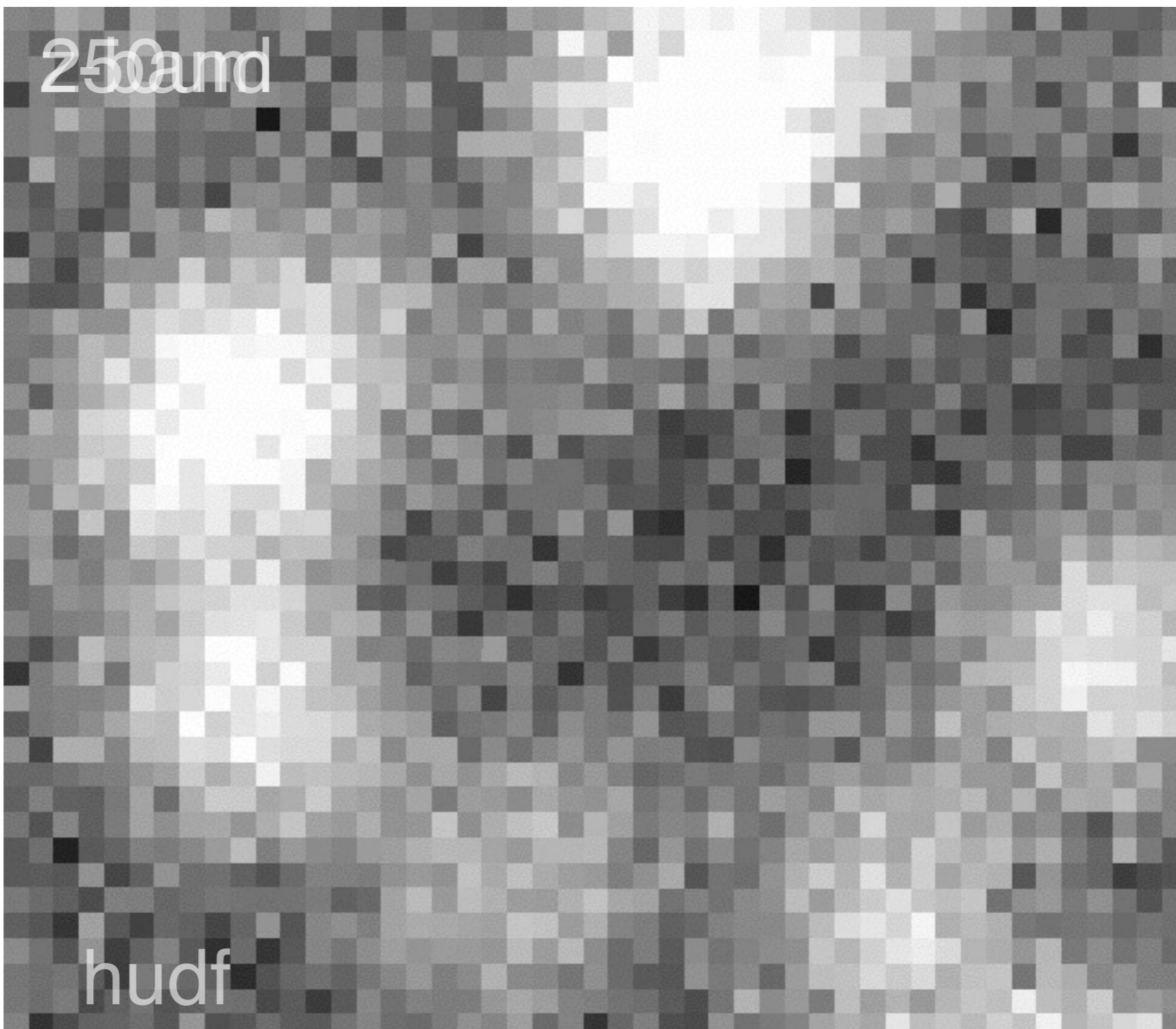
20 scans



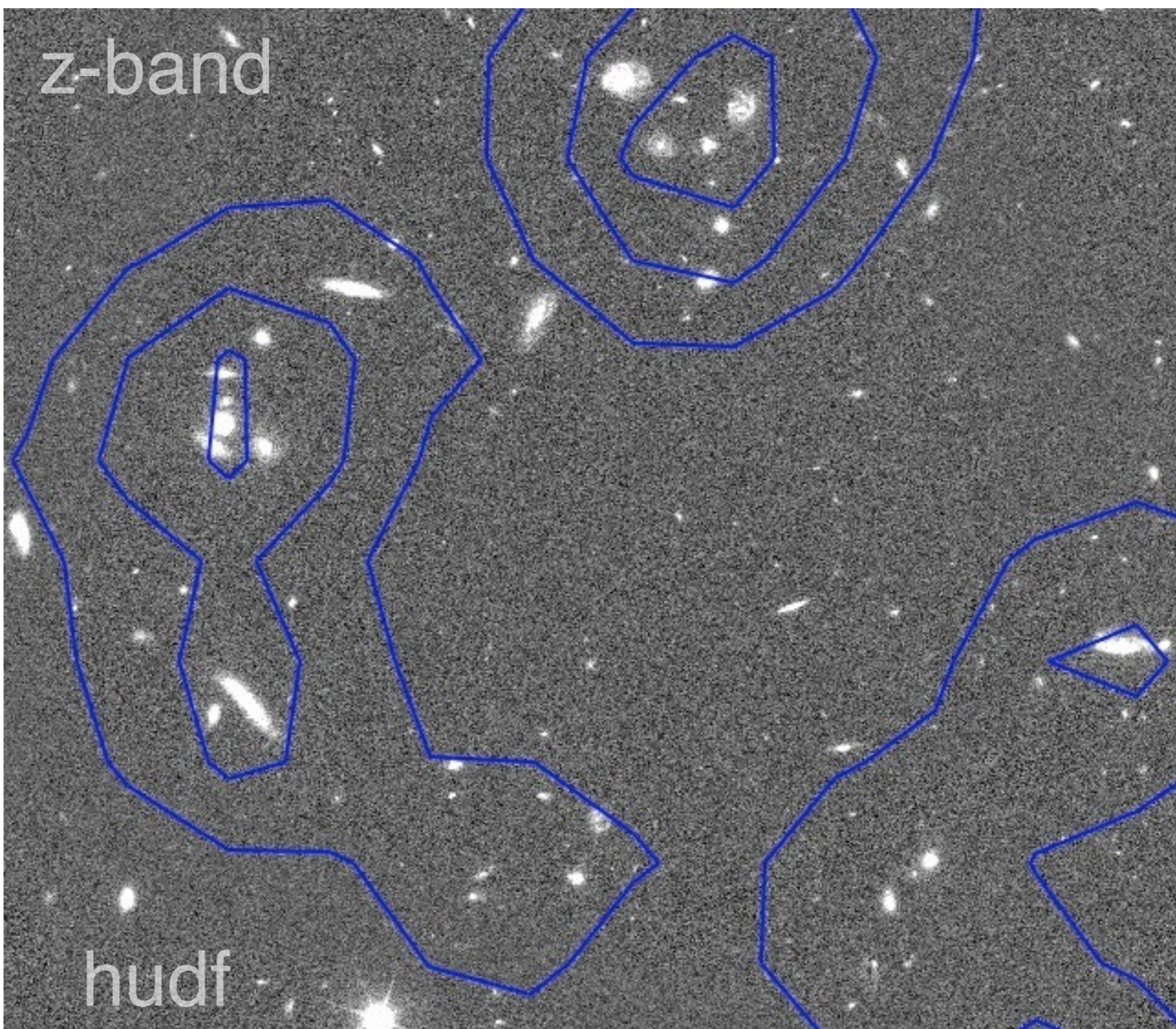
Confusion Noise



Confusion Noise



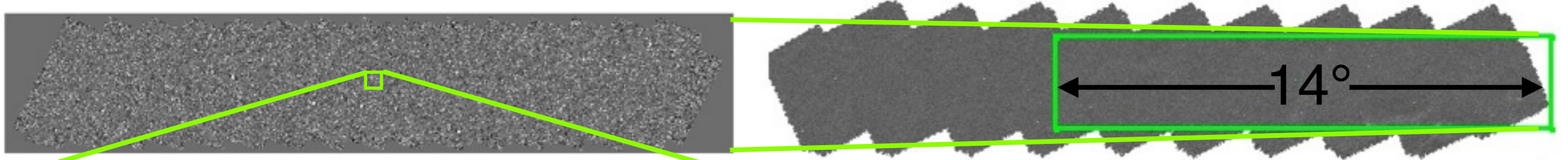
Confusion Noise



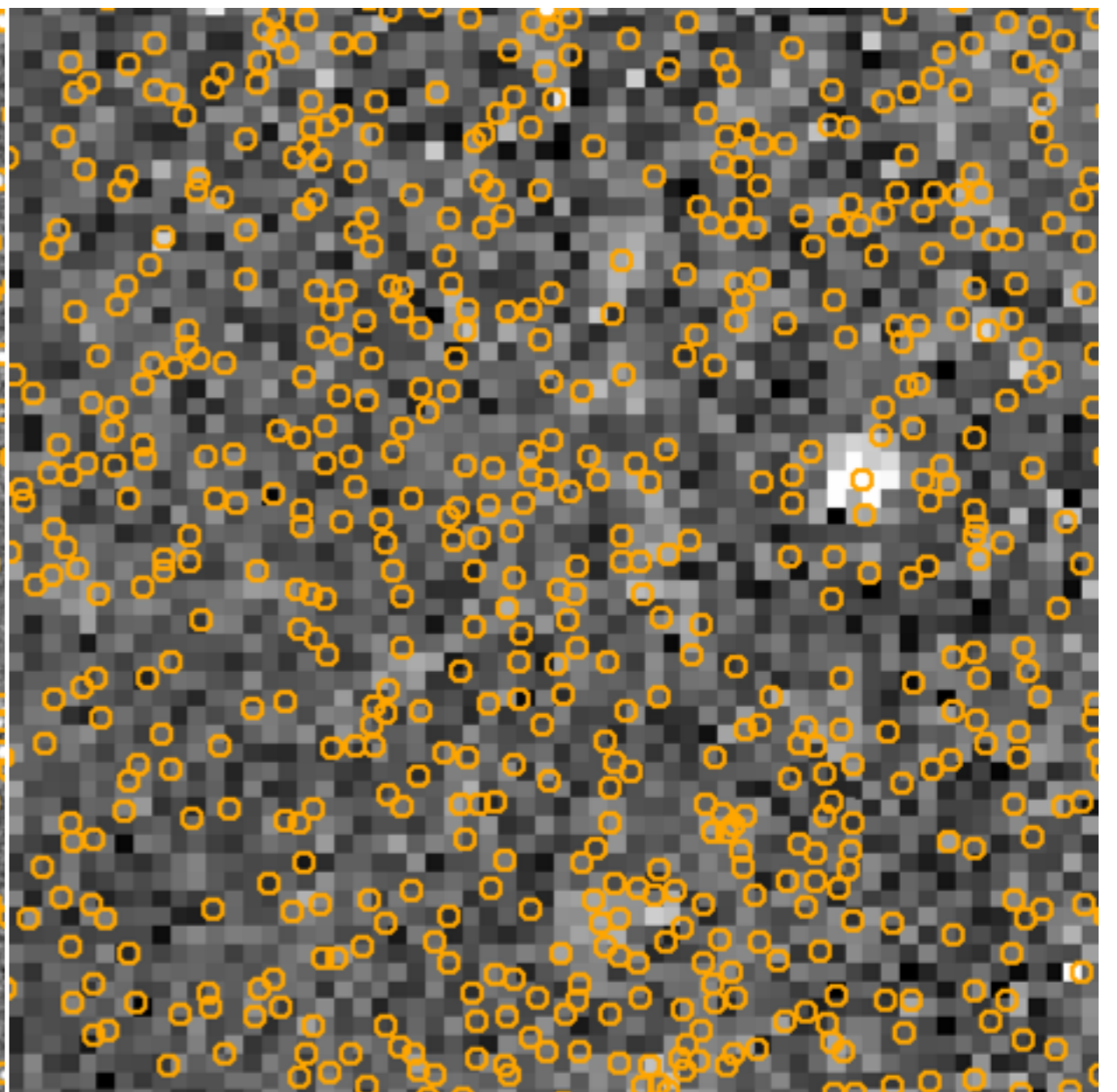
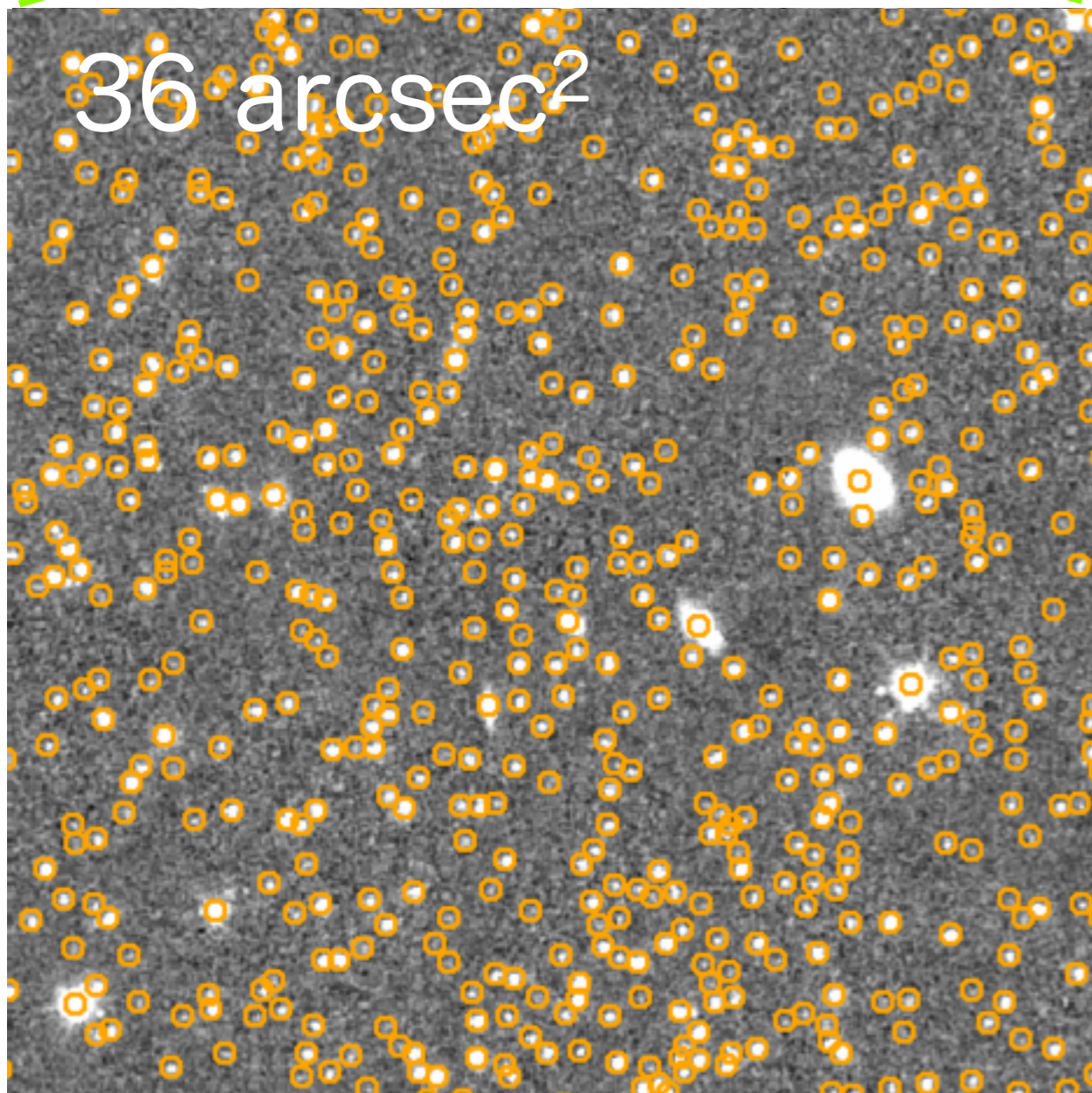
Dealing with Confusion

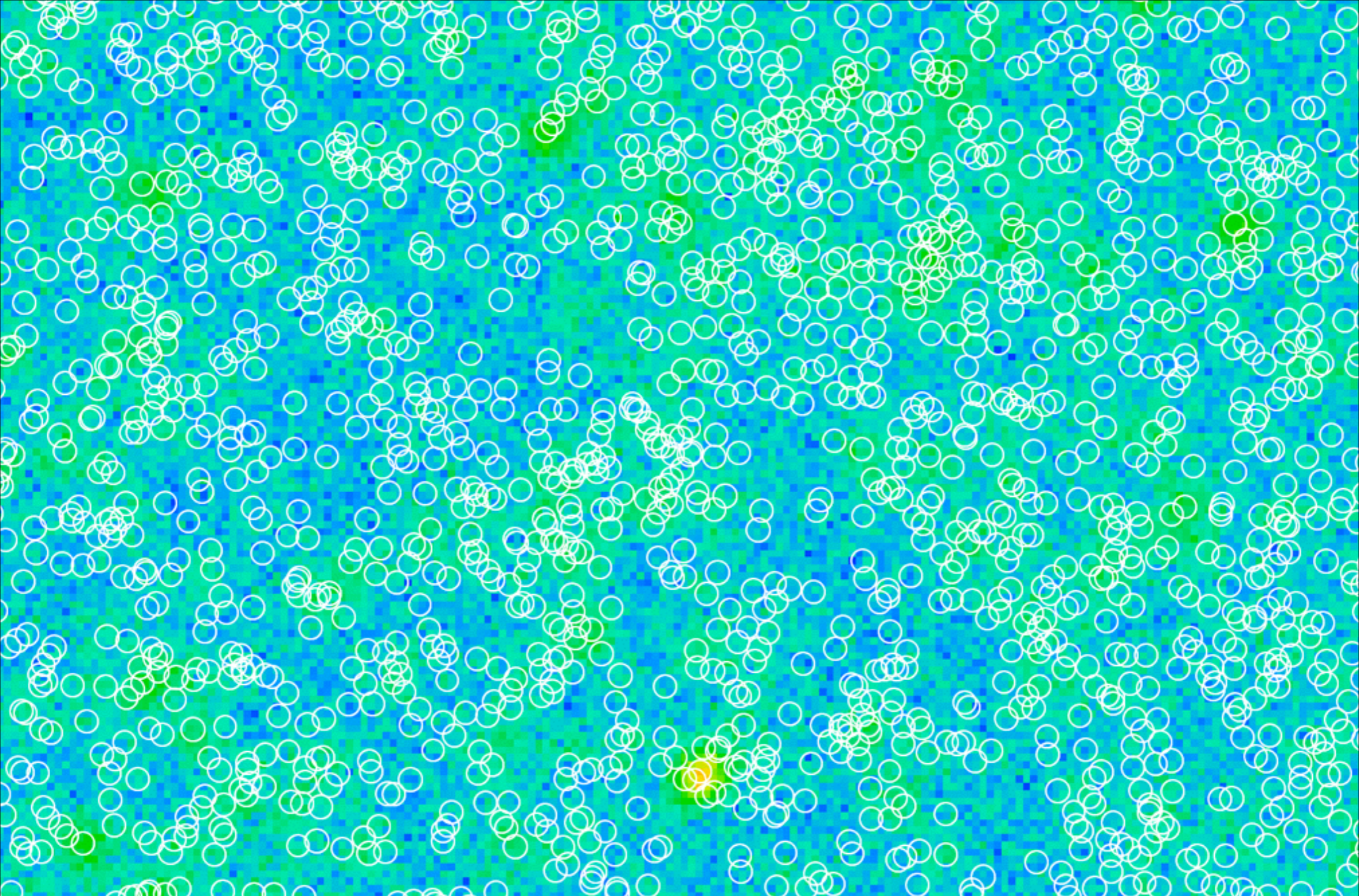
SHELA IRAC 3.6 μm

HerS SPIRE 250 μm

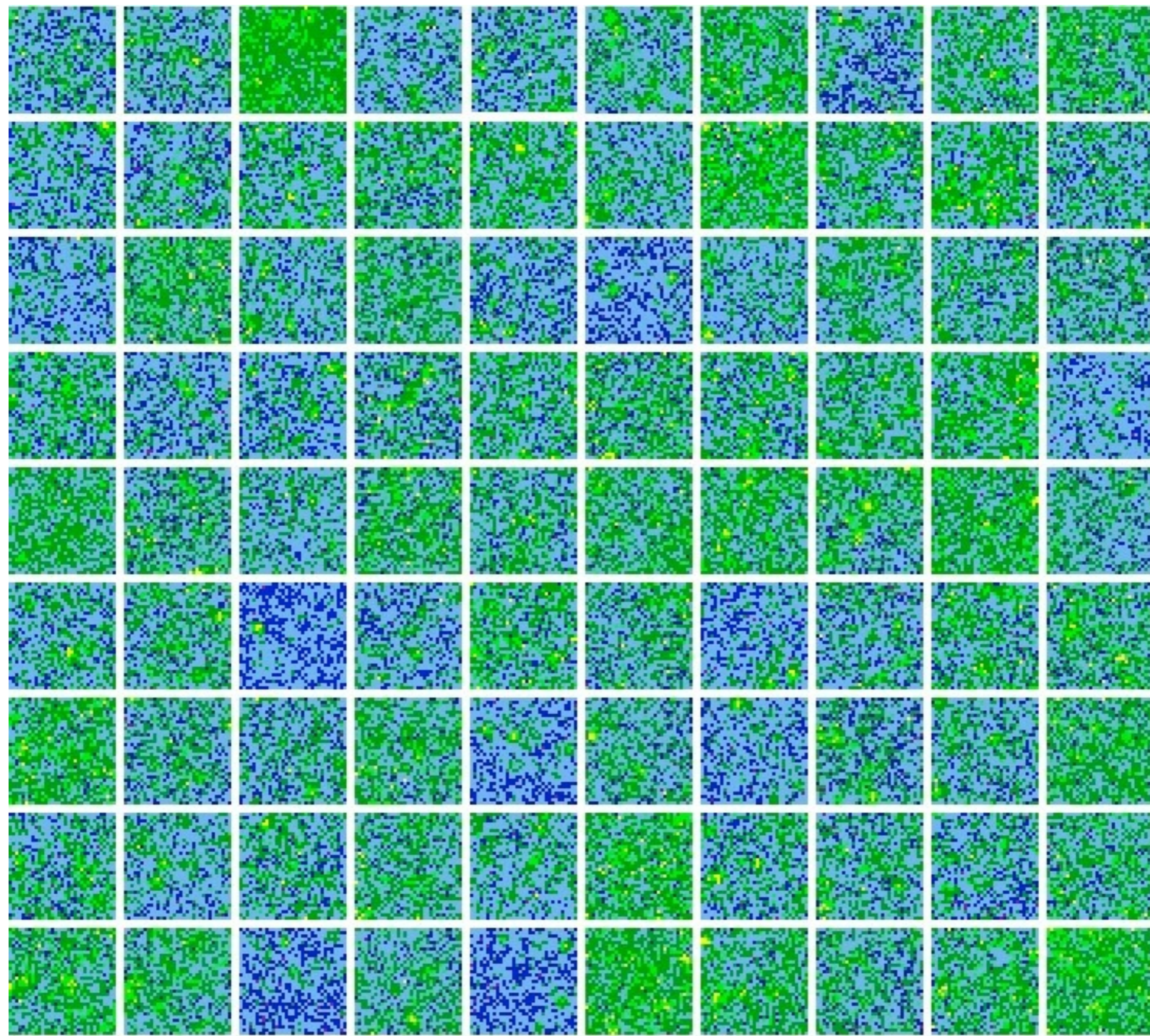


14°





Stacking & Cross-Correlations



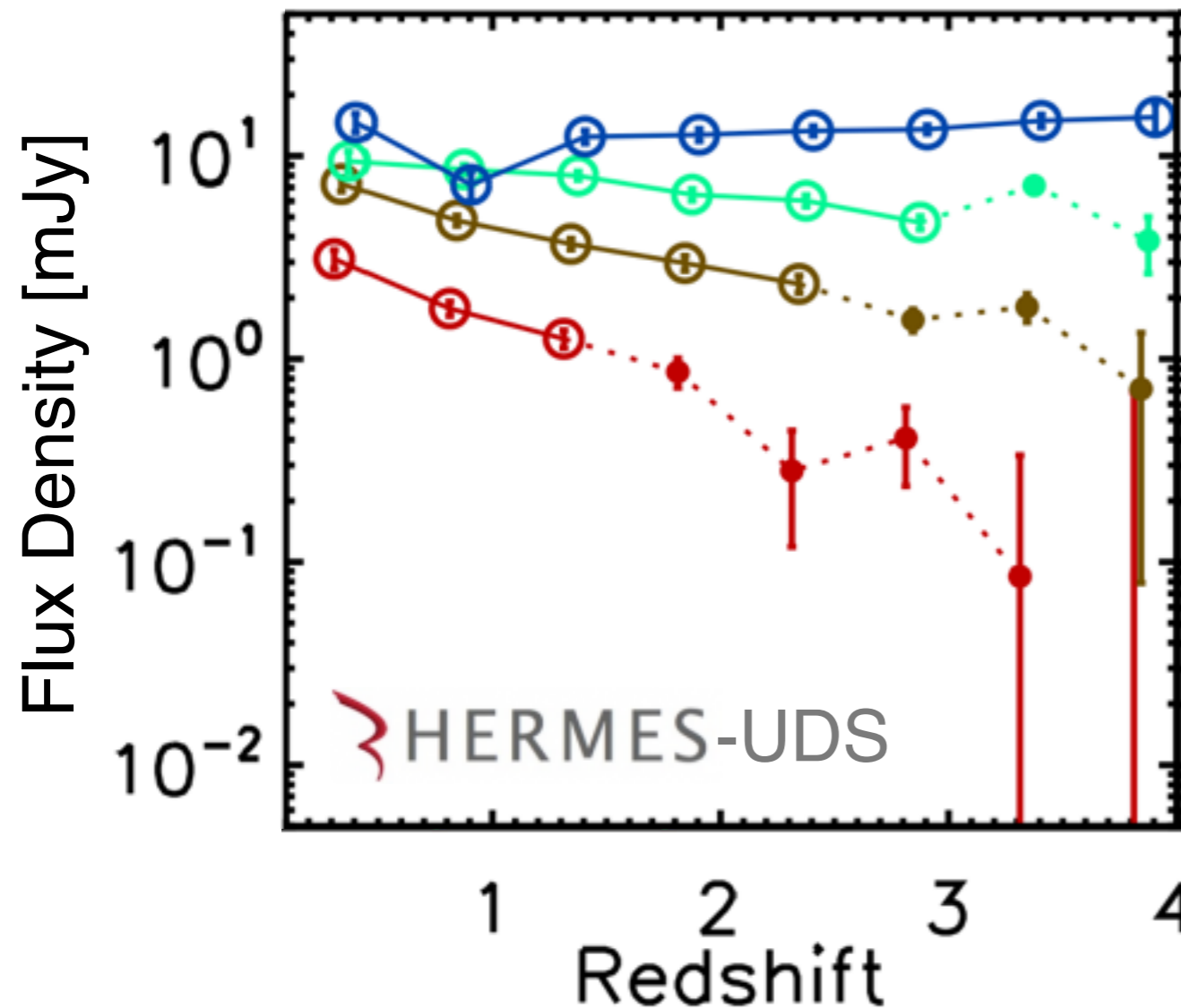
thumbnail stacking

Phil Korngut (Caltech)

thumbnail stacking

stacked flux densities

350 μ m



Viero, Moncelsi, Quadri et al. (2013)
arXiv:1304.0446

catalog (Williams & Quadri, in prep.)

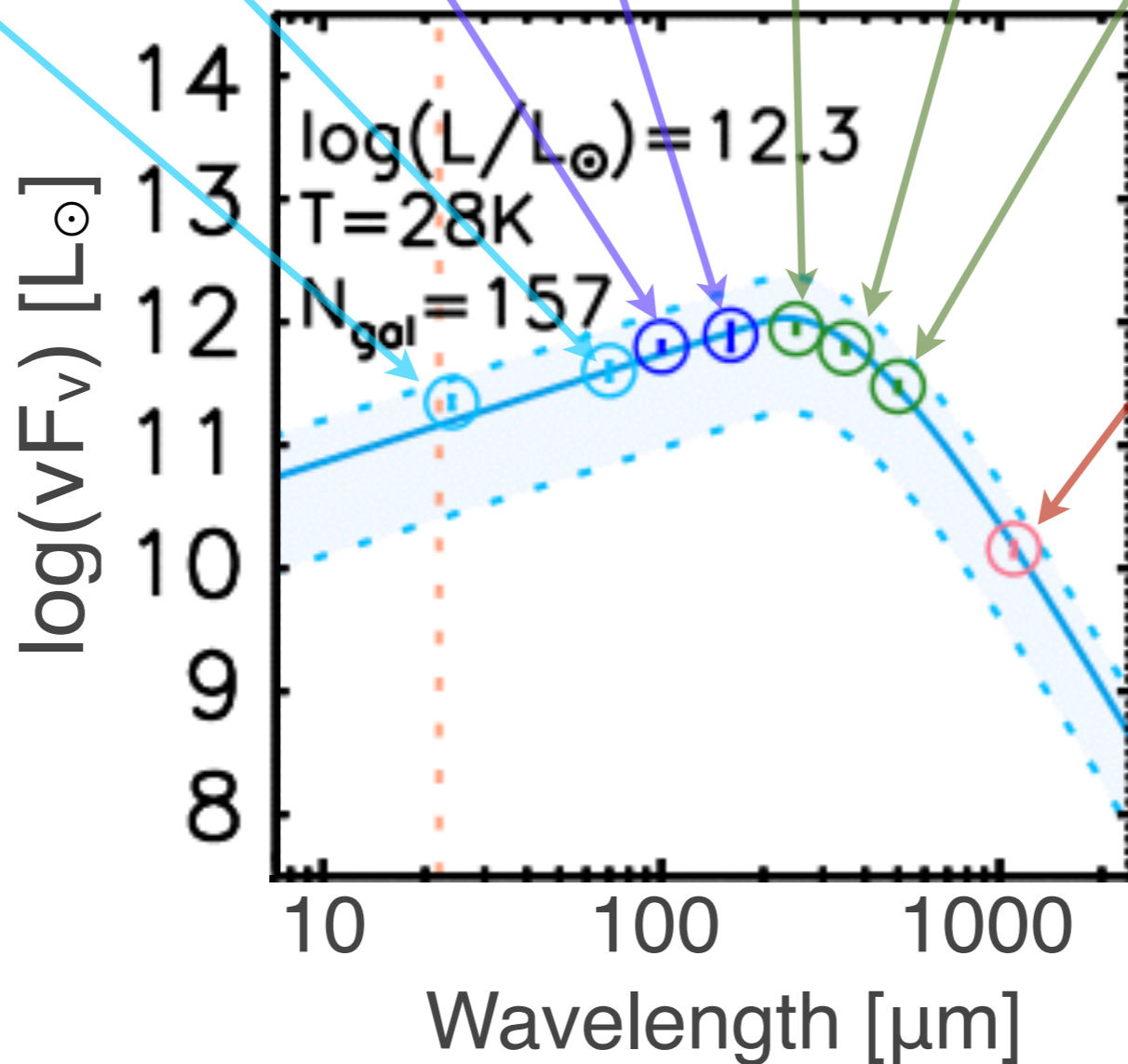
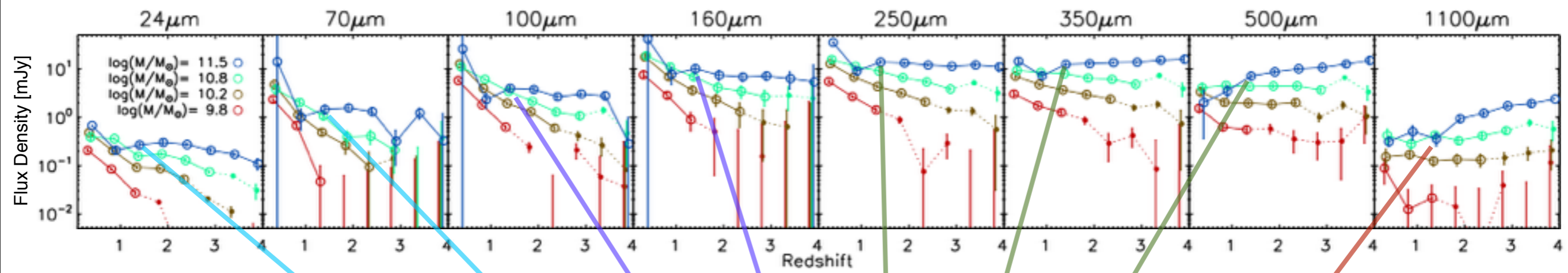
- UKIDSS/UDS [2/3 deg²]
- uBVRizJHK + IRAC ch1234
- K-band magnitude cut 24 AB
- 81,000 sources in ~0.63 deg²
- redshifts - EAZY (Brammer 2008)
- masses - FAST (Kriek 2009)

HERMES-UDS

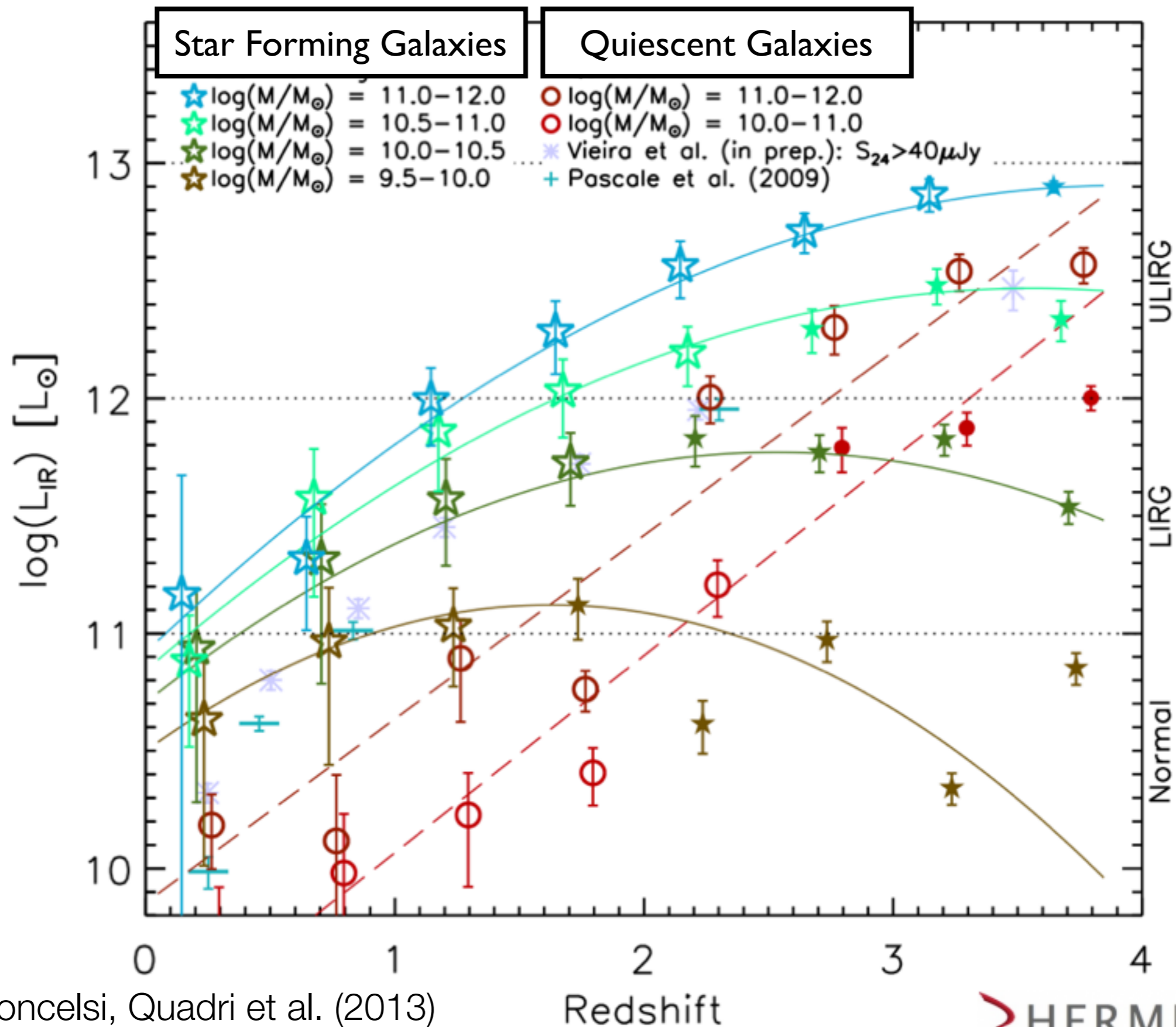
maps (HerMES; Oliver et al. 2012)

- *Spitzer*/MIPS
 - 24, 70 μ m
- *Herschel*/PACS
 - 100, 160 μ m
- *Herschel*/SPIRE
 - 250, 350, 500 μ m
- ASTE/AzTEC
 - 1100 μ m

stacked flux density



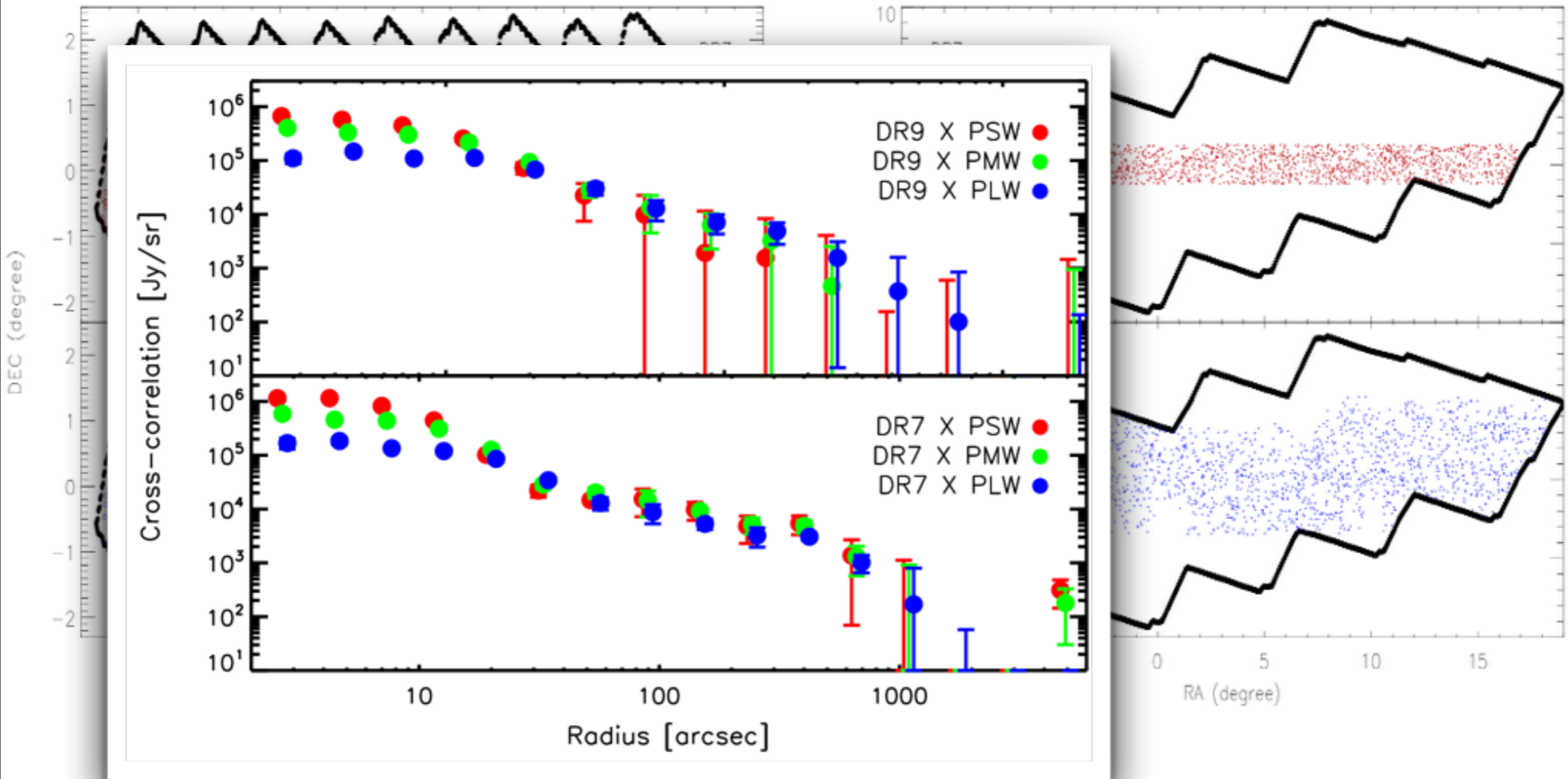
Infrared Luminosities



Viero, Moncelsi, Quadri et al. (2013)

arXiv:1304.0446

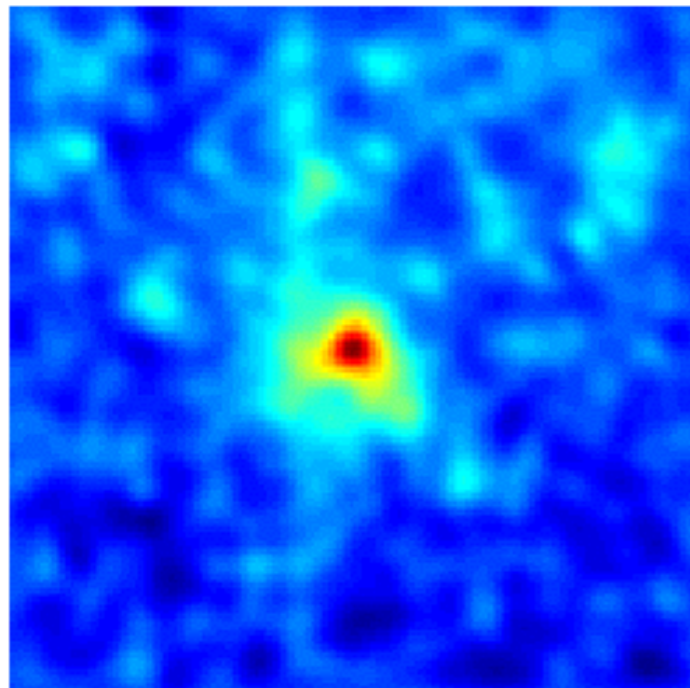
X-Correlations with SDSS QSOs



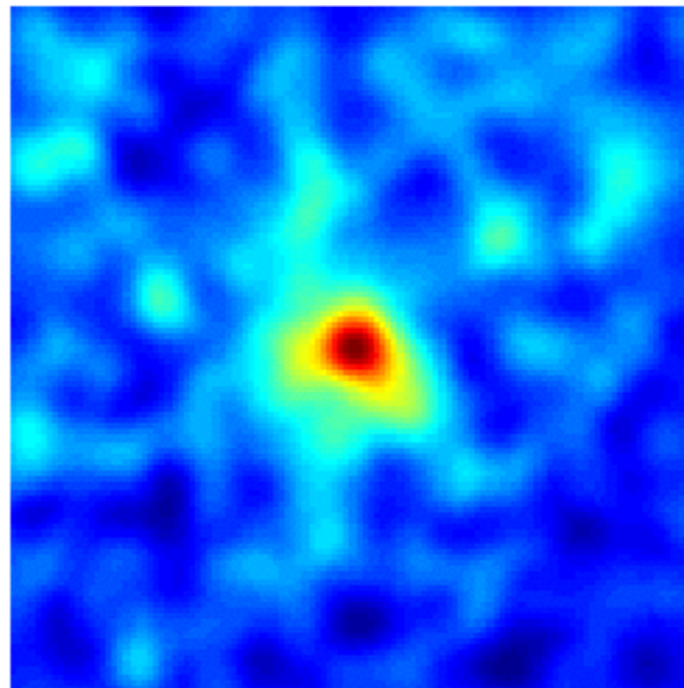
Wang et al. (in prep.)

Cluster Stack

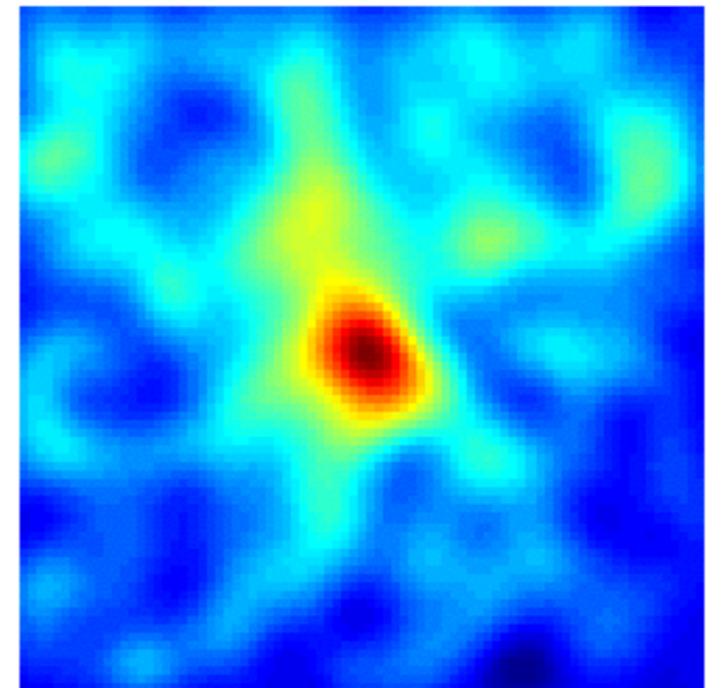
250 μm



350 μm

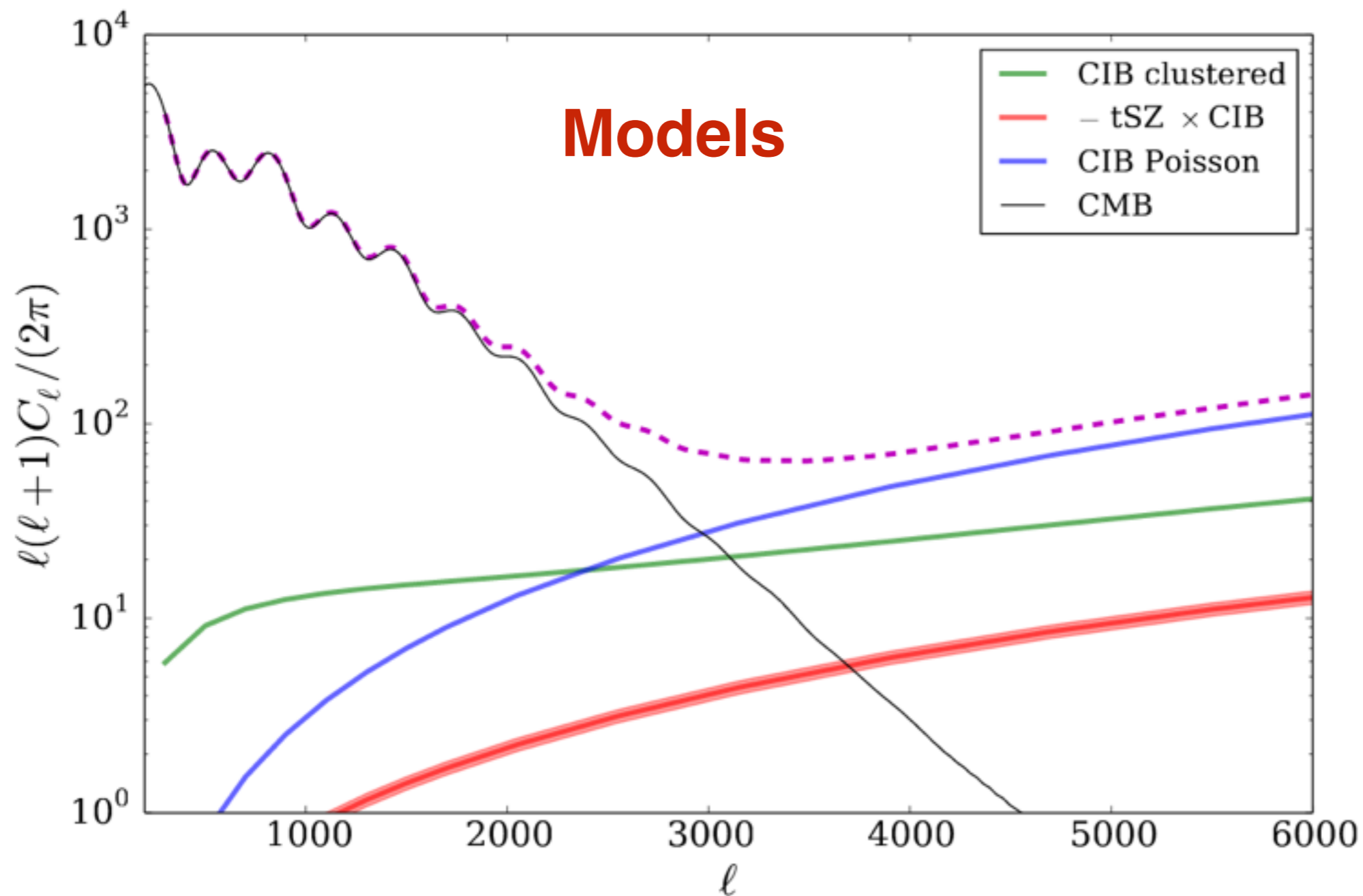


500 μm



Phil Korngut using Rykoff et al. 2013 redMapper positions

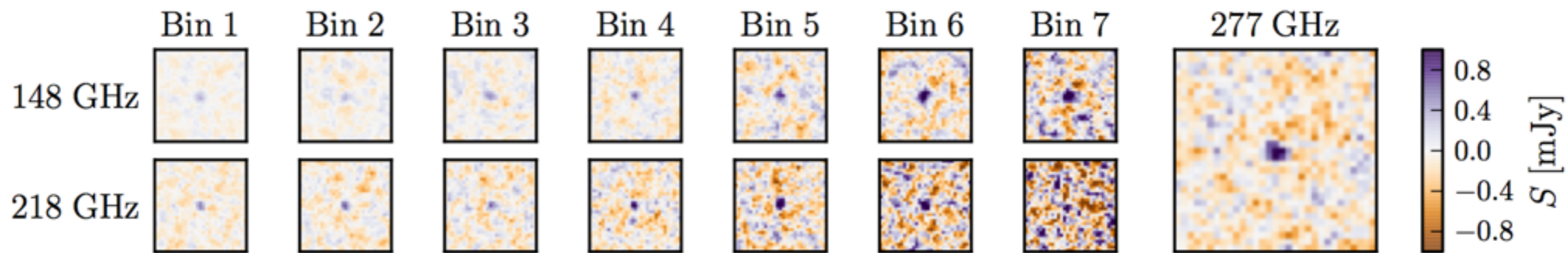
ACT x Herschel



- SZ correlates with DSFGs
- coming soon!

Hajian, Wang et al. (in prep.)

HerS Submillimeter and ACT SZ detections in Radio Stacks



- Stacked ~ 4400 Radio galaxies in HerS/ACT
- Detection of SZ in $\log(M/M_{\odot}) \sim 13$ halos

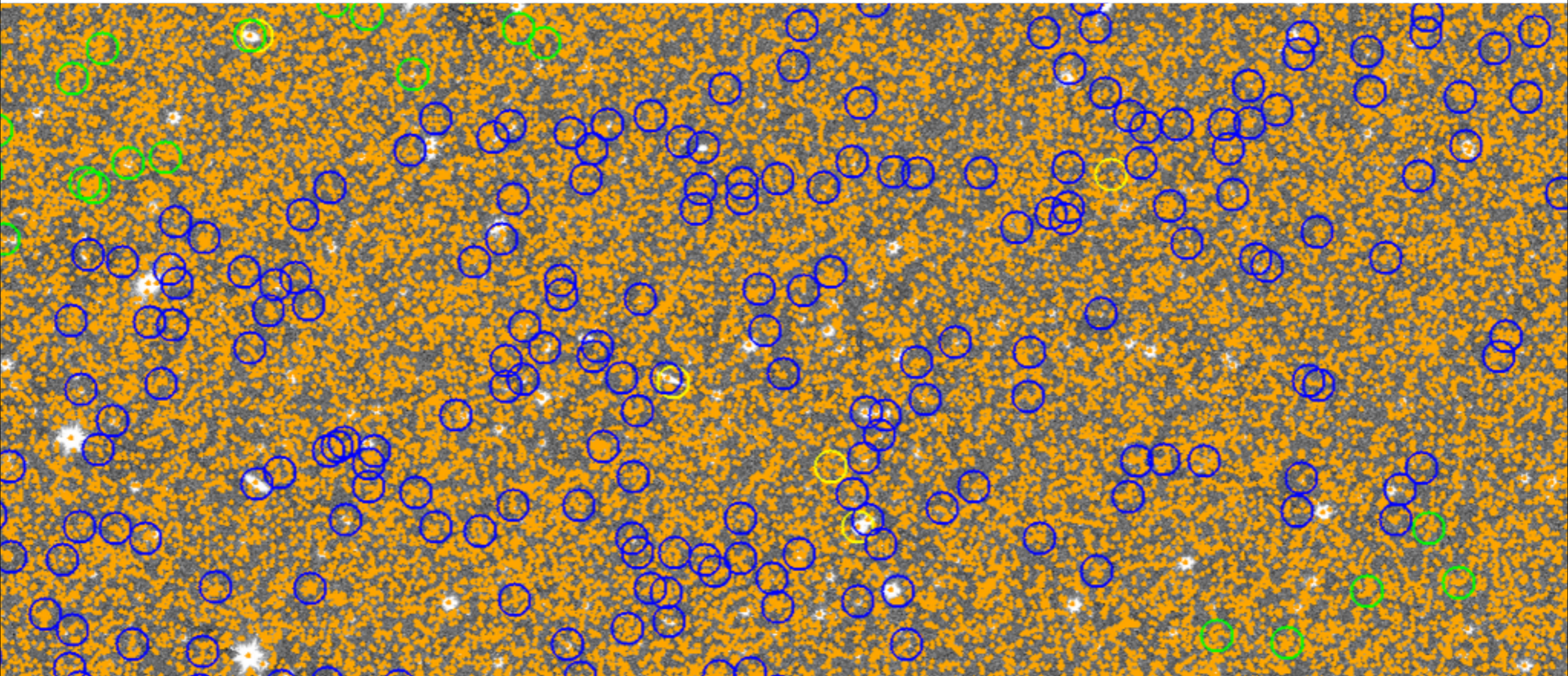
HerS x ACT

Gralla et al. 2013; arXiv:1310.8281

Catalog Matching: be careful!

HerS SPIRE 250 μm

SHELA IRAC 3.6 μm





Viero+ 2014
arXiv:1308.4399



Oliver+ 2012
arXiv:1203.2562



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(coming in June) <http://hedam.lam.fr/HerMES/>