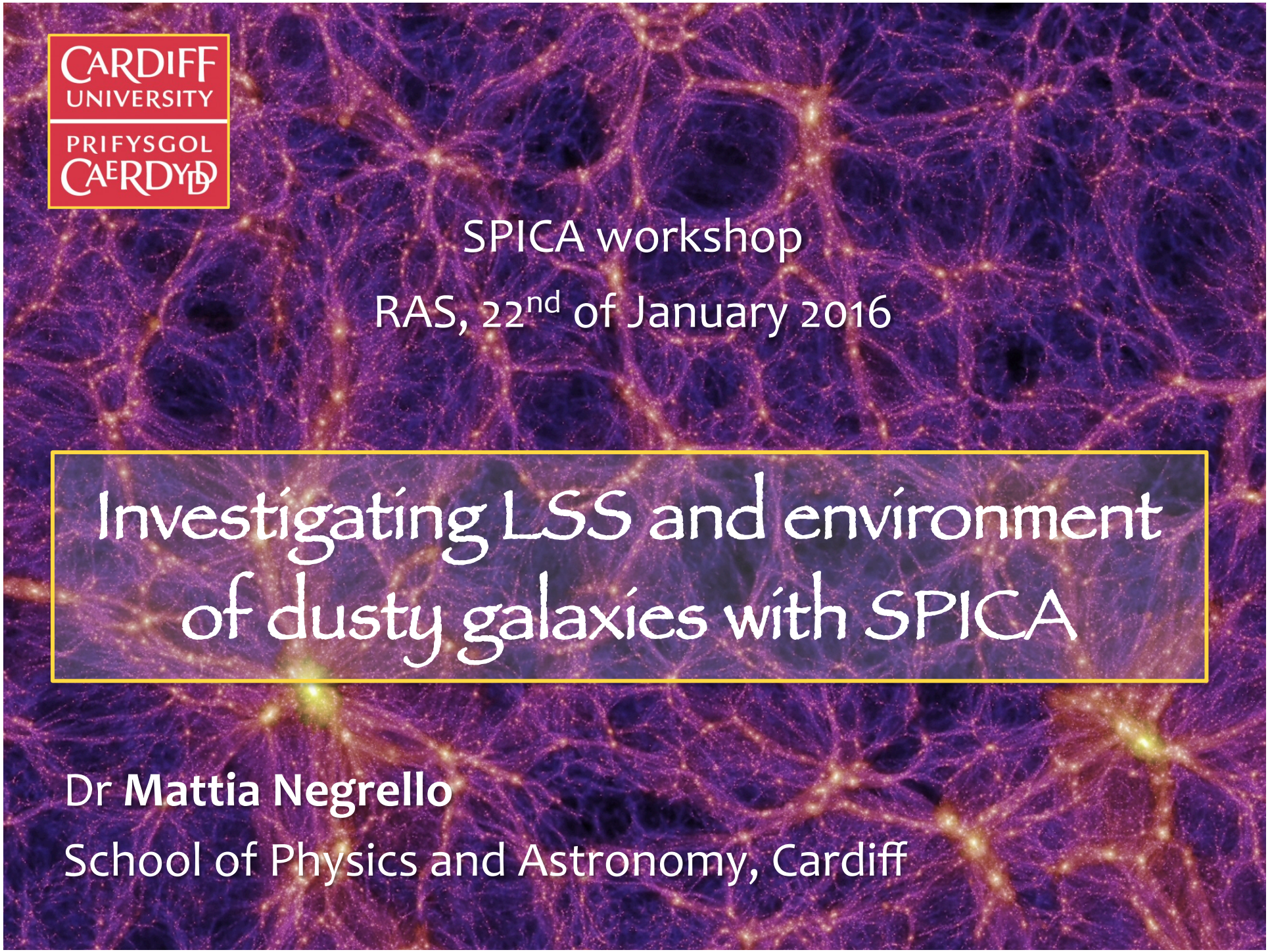
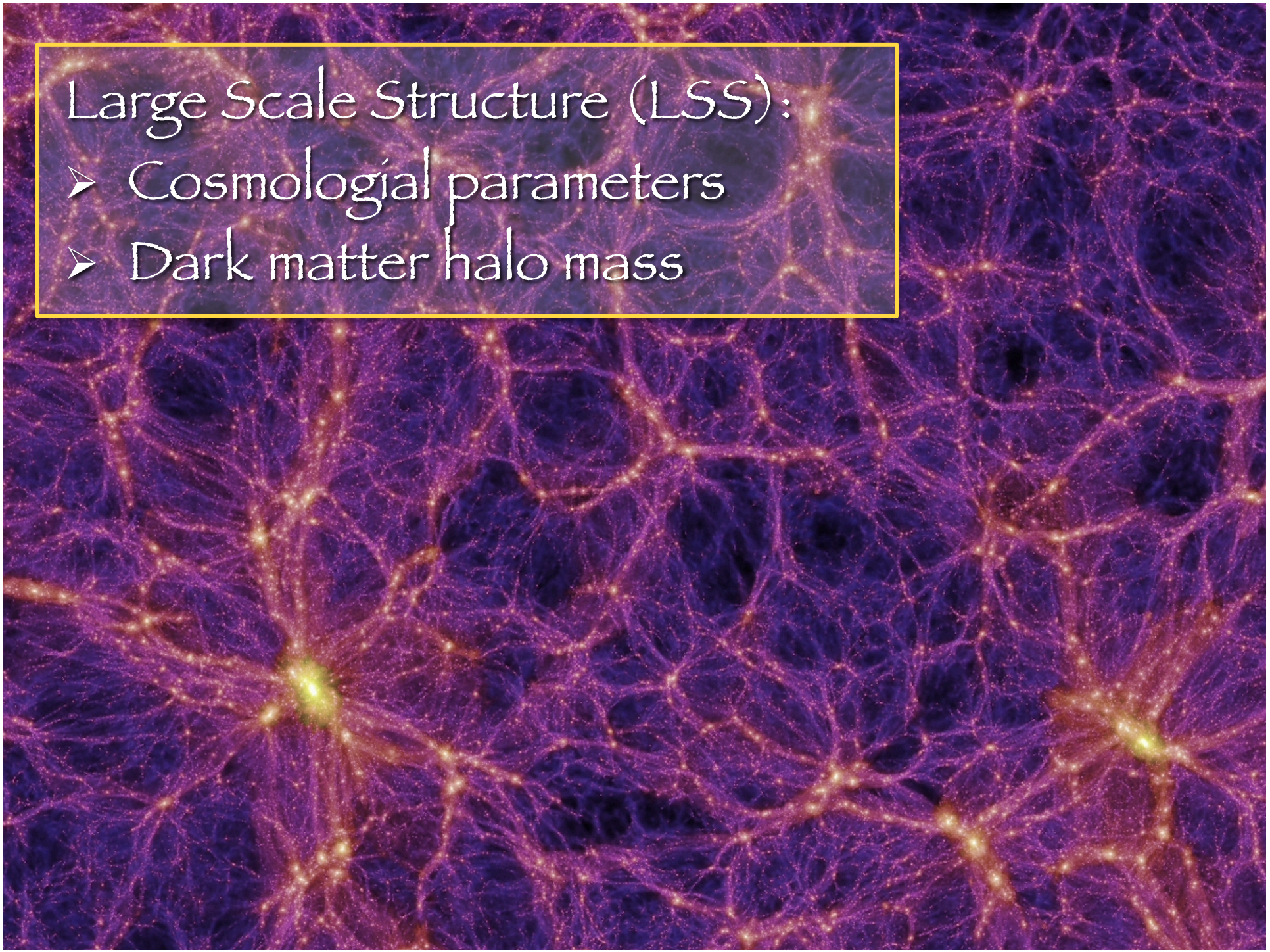

CARDIFF UNIVERSITY
PRIFYSGOL CAERDYDD
SPICA workshop
RAS, 22nd of January 2016
Investigating LSS and environment of dusty galaxies with SPICA
Dr Mattia Negrello
School of Physics and Astronomy, Cardiff


Large Scale Structure (LSS):
Cosmological parameters
Dark matter halo mass

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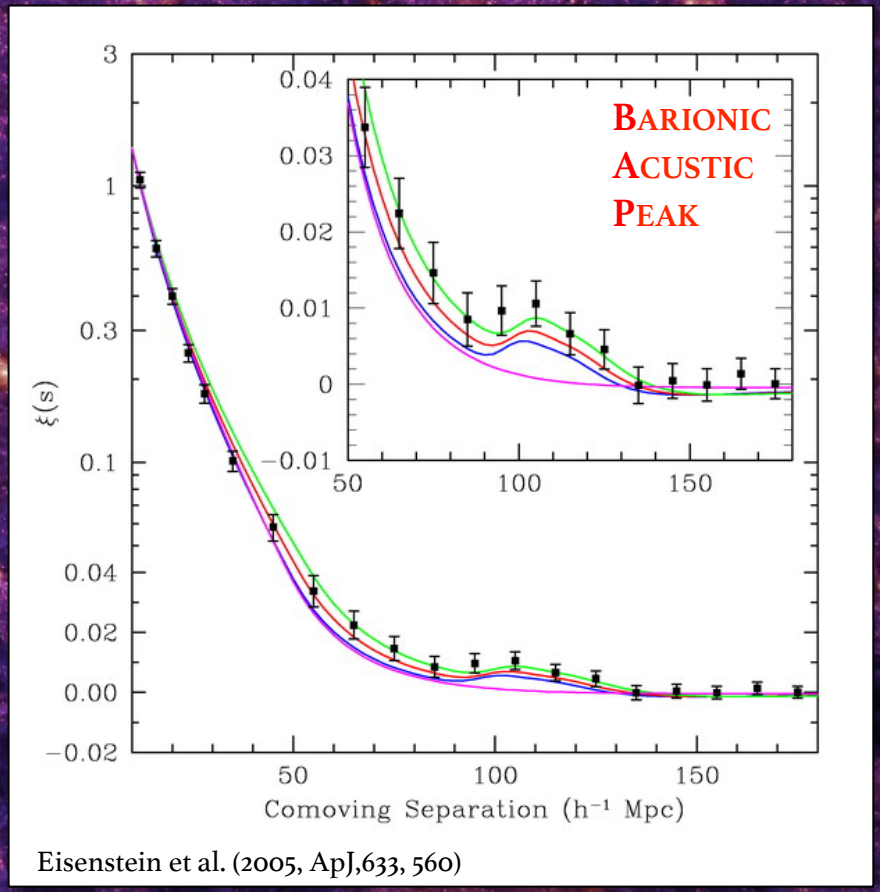
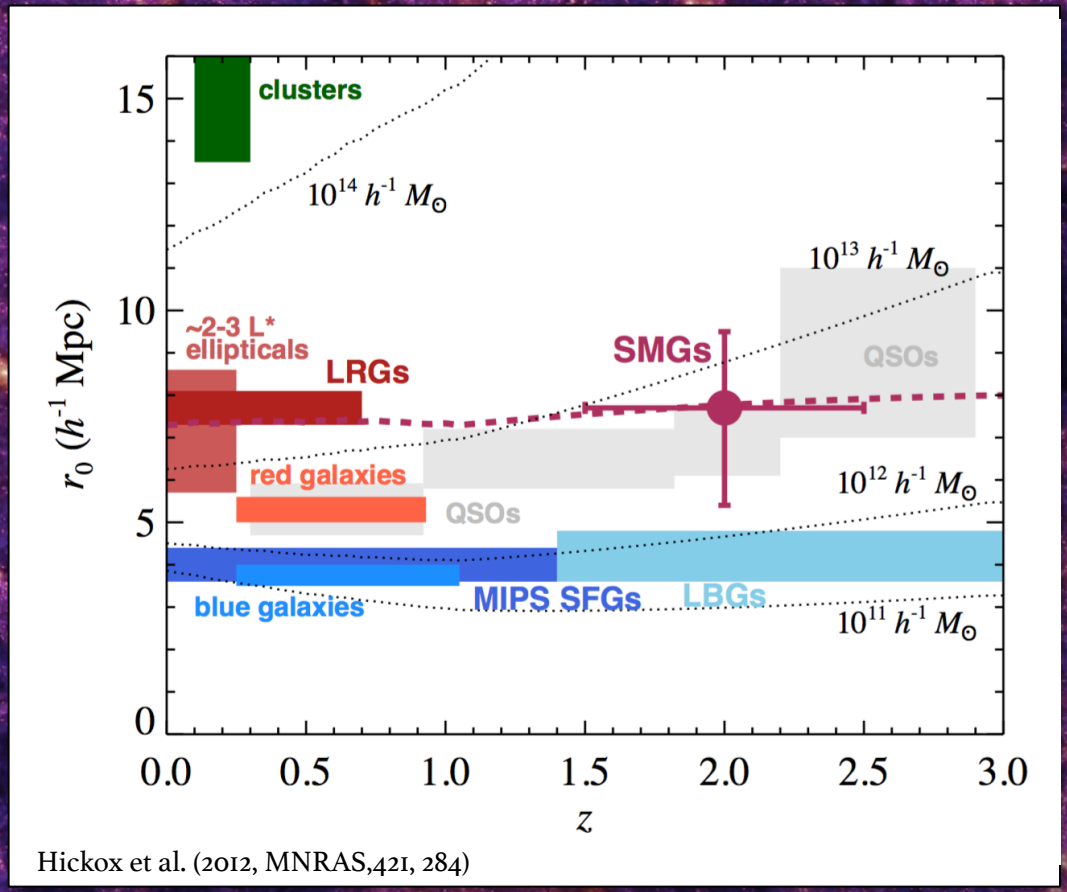


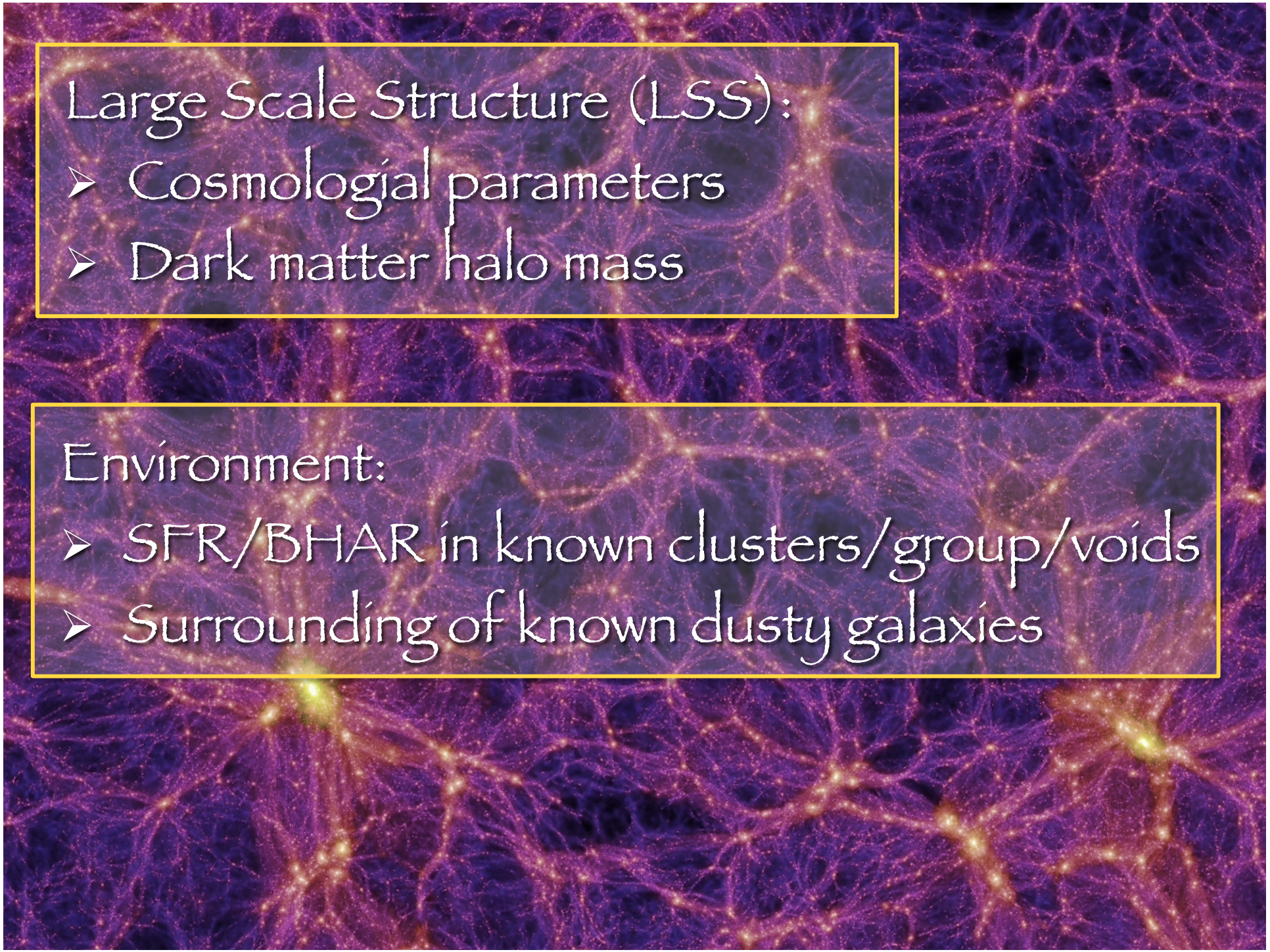
Eisenstein et al. (2005, ApJ,633, 560)

Large Scale Structure (LSS):

- Cosmological parameters
- Dark matter halo mass



Hickox et al. (2012, MNRAS,421, 284)

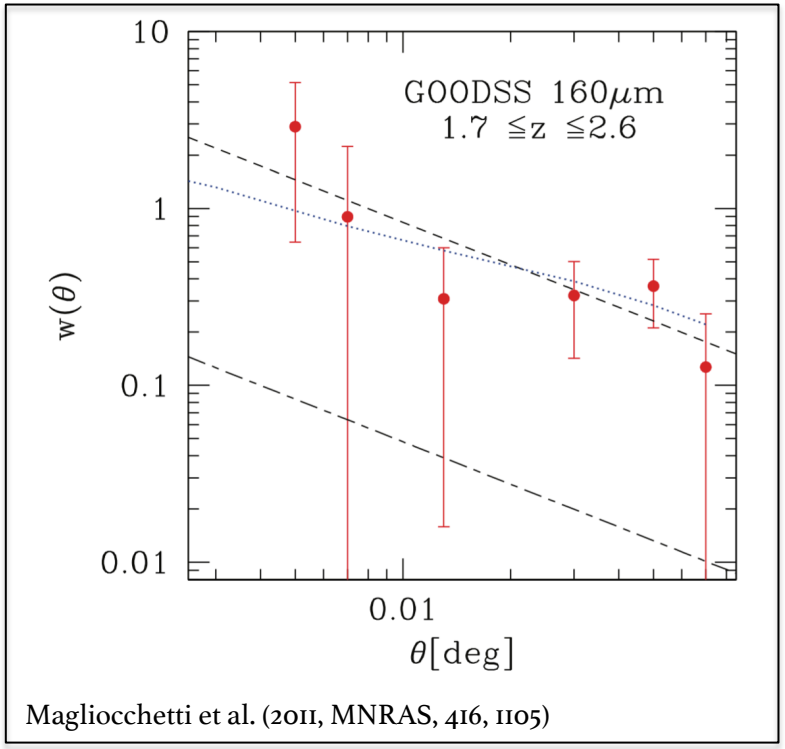

Large Scale Structure (LSS):
Cosmological parameters
Dark matter halo mass
Environment:
SFR/BHAR in known clusters/group/voids
Surrounding of known dusty galaxies

Clustering of dusty galaxies

SCUBA (Blain et al. 2004), **LABOCA** (Hickox et al. 2012) ,

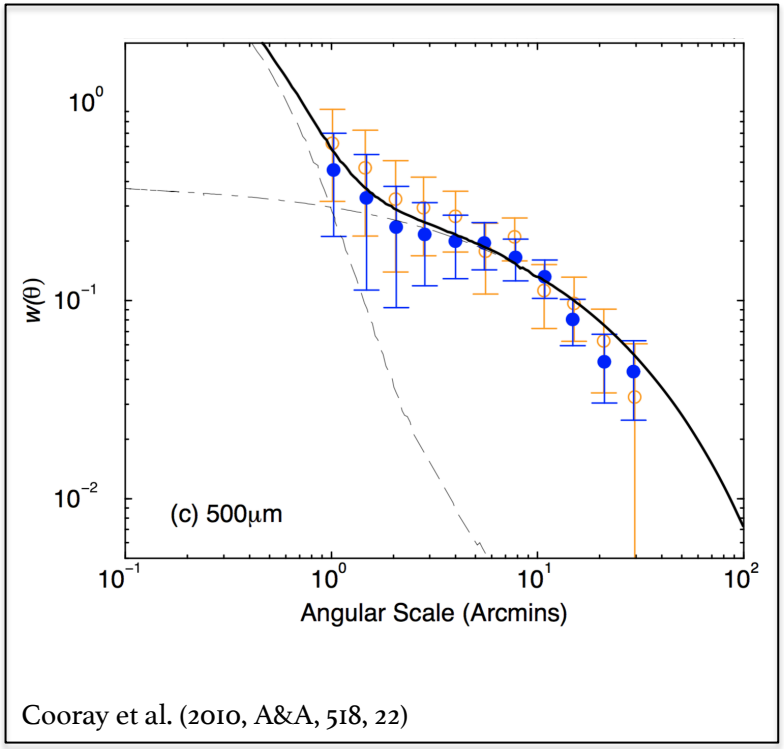
Spitzer (Magliocchetti et al. 2008),

Herschel (Cooray et al. 2010, Maddox et al. 2010, Magliocchetti et al. 2011)



Magliocchetti et al. (2011, MNRAS, 416, 1105)

SMALL STATISTICS



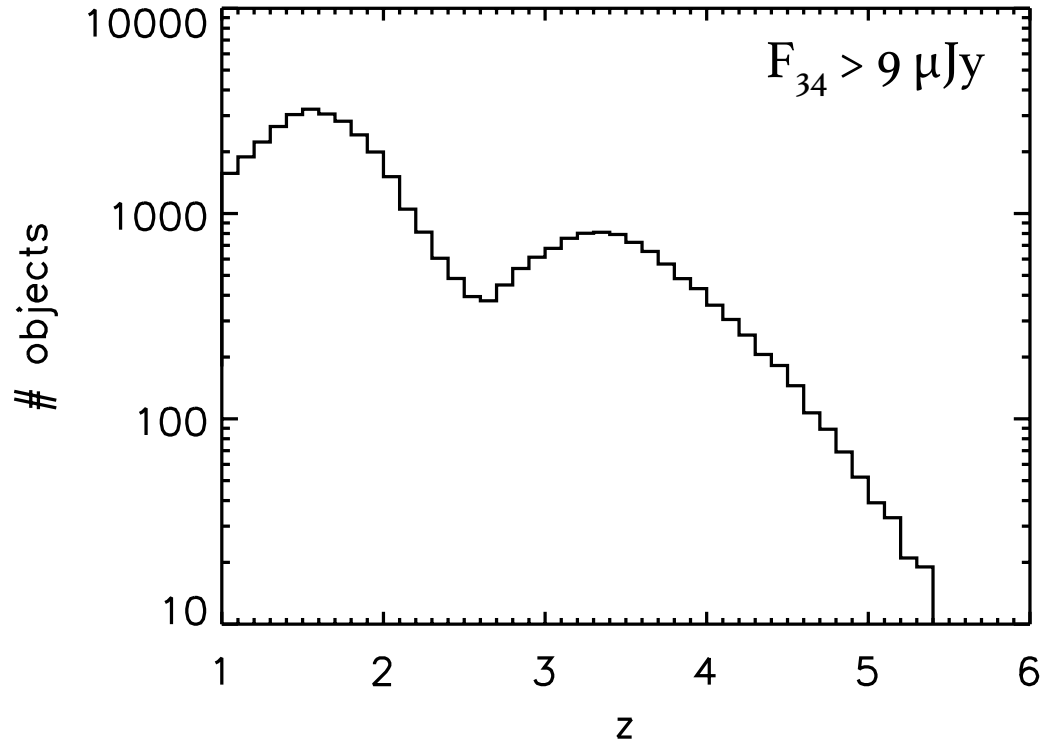
Cooray et al. (2010, A&A, 518, 22)

NO Z-SPEC INFO

Clustering of dusty galaxies

1 deg² survey with the SMI Camera at **30-37 μm**

- **confusion limited: 9 μJy**
- Total time: **64 hours**



Cai et al. (2013, ApJ, 768, 21)

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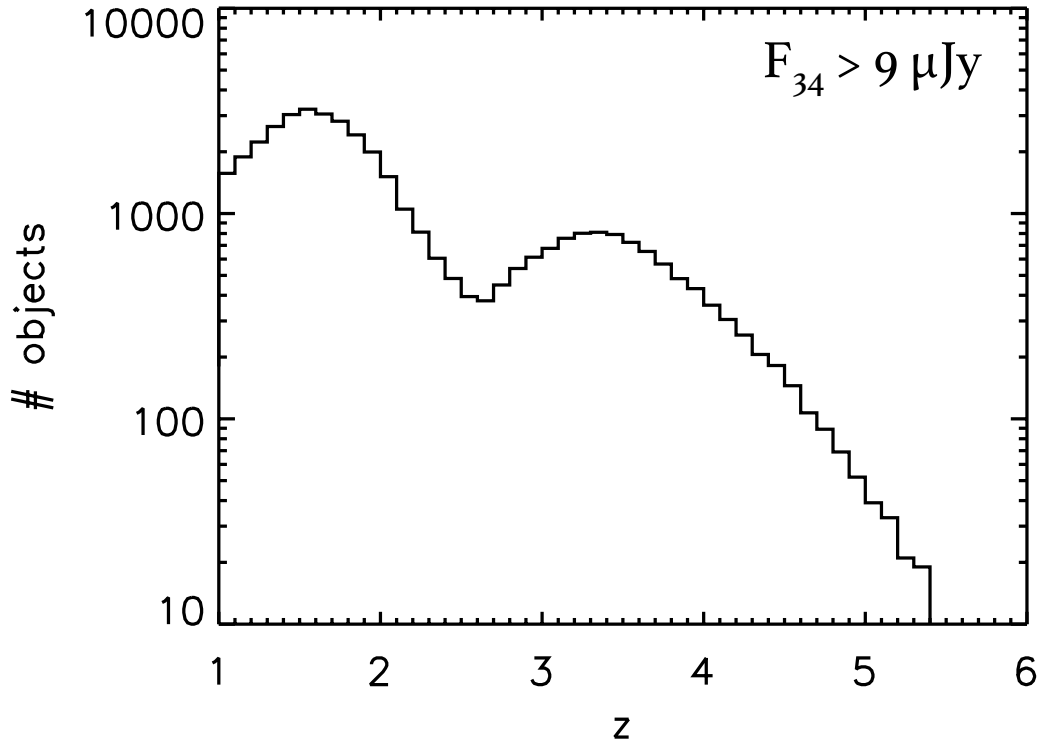

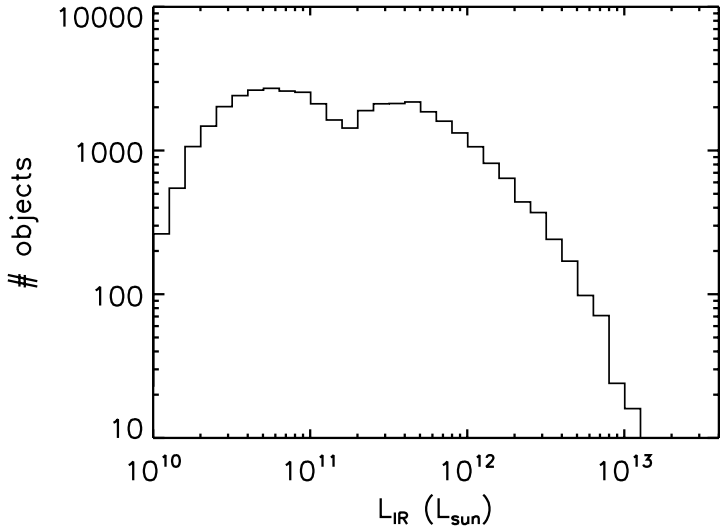

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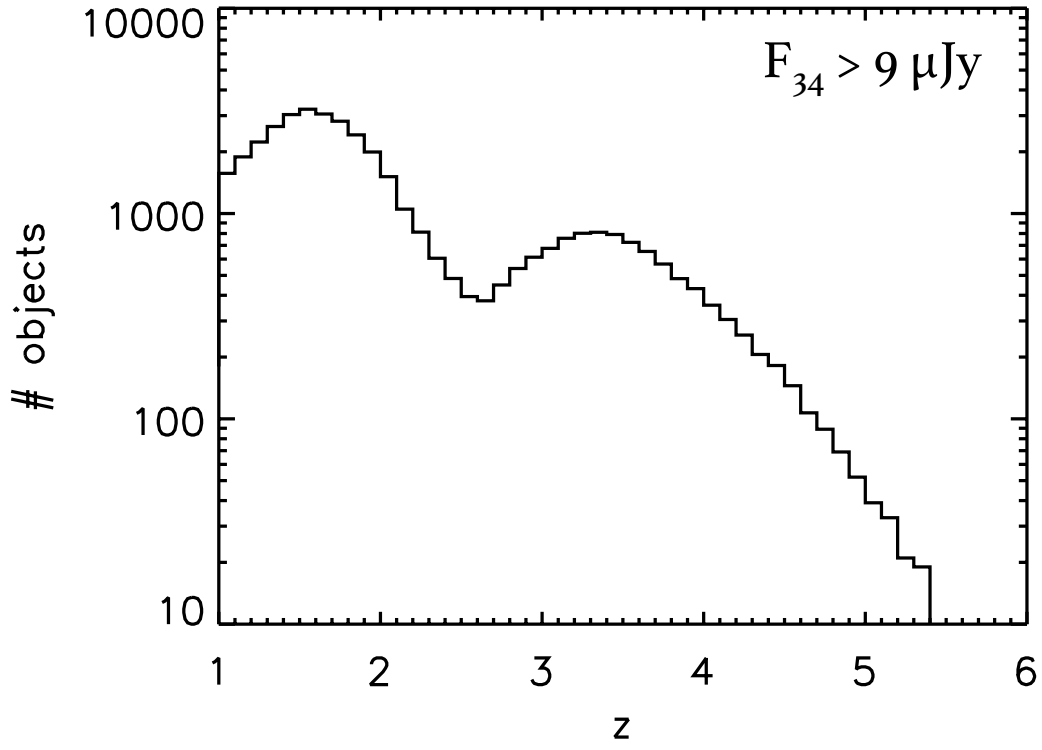

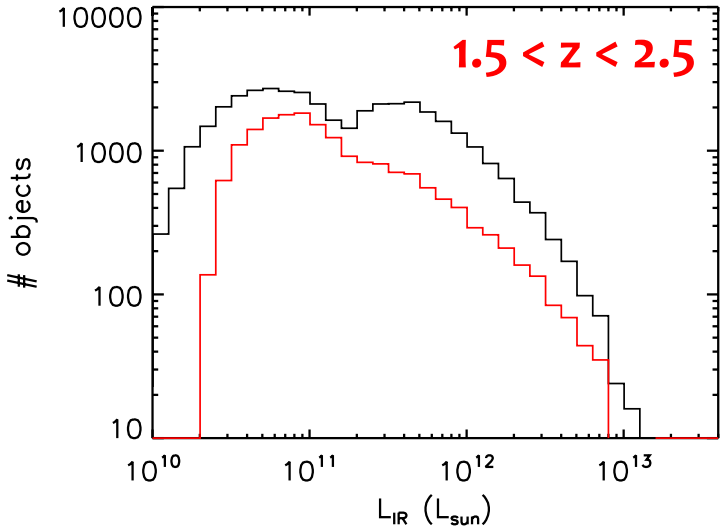

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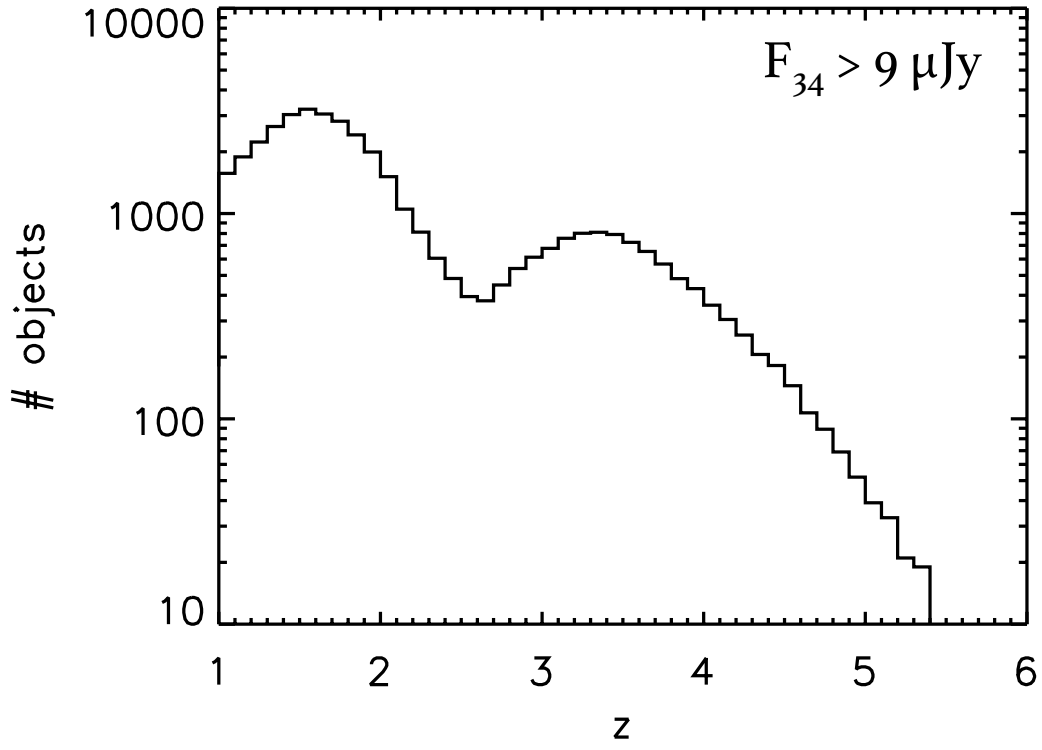
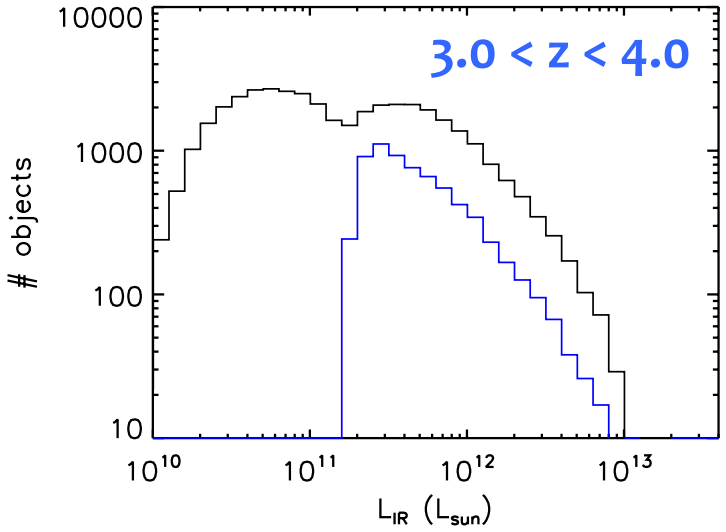
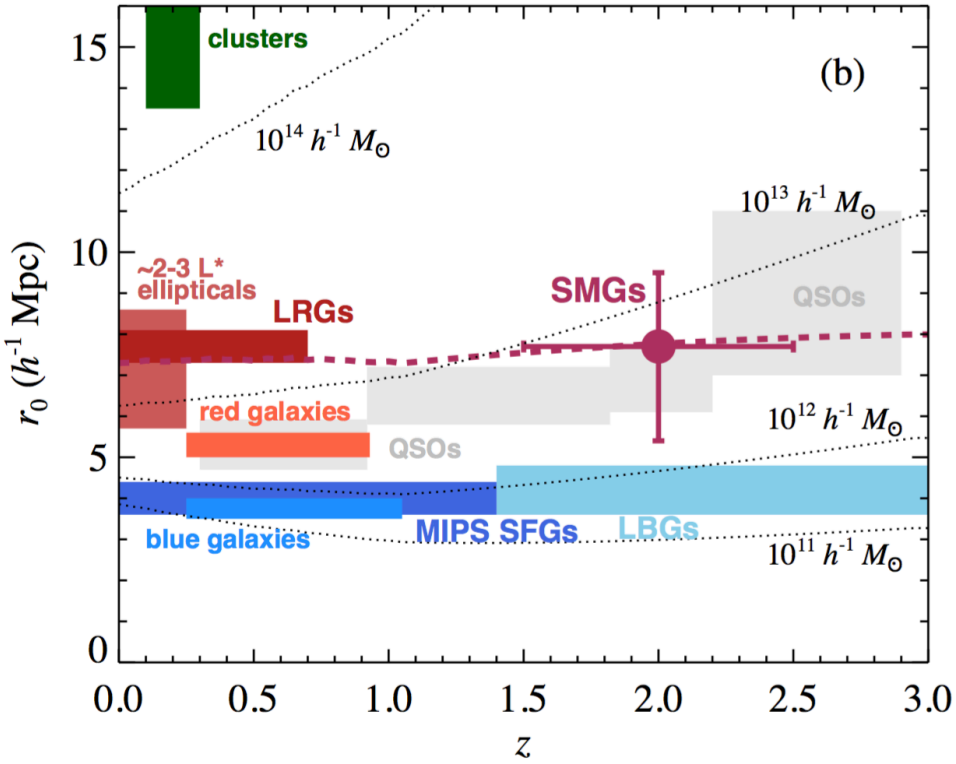




Cai et al. (2013, ApJ, 768, 21)

Clustering of dusty galaxies

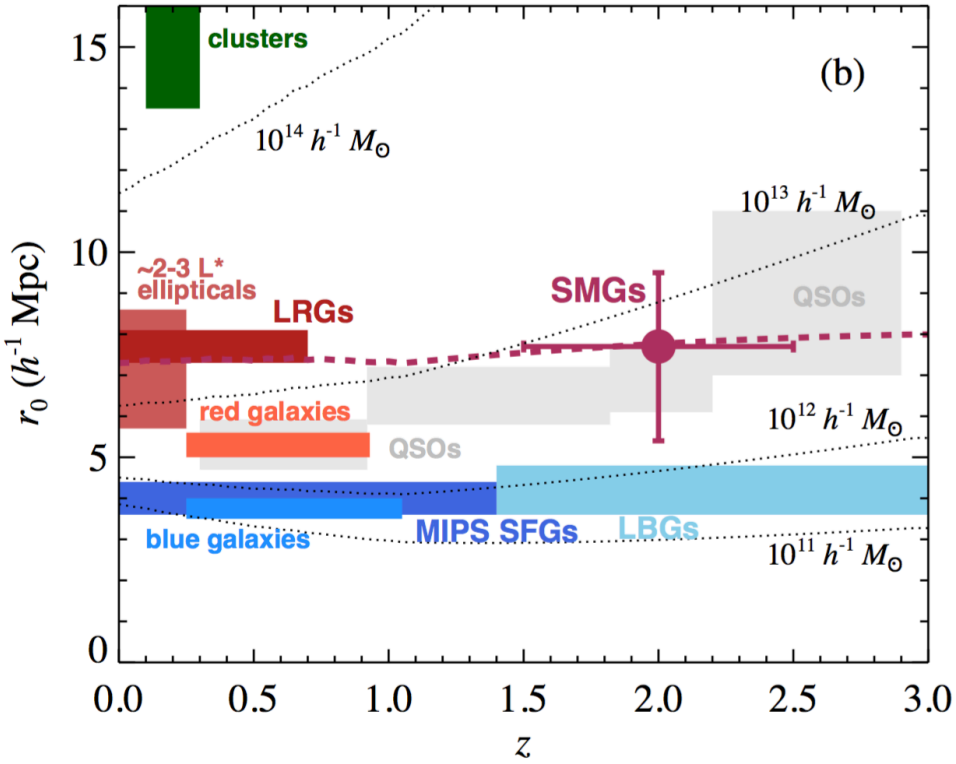


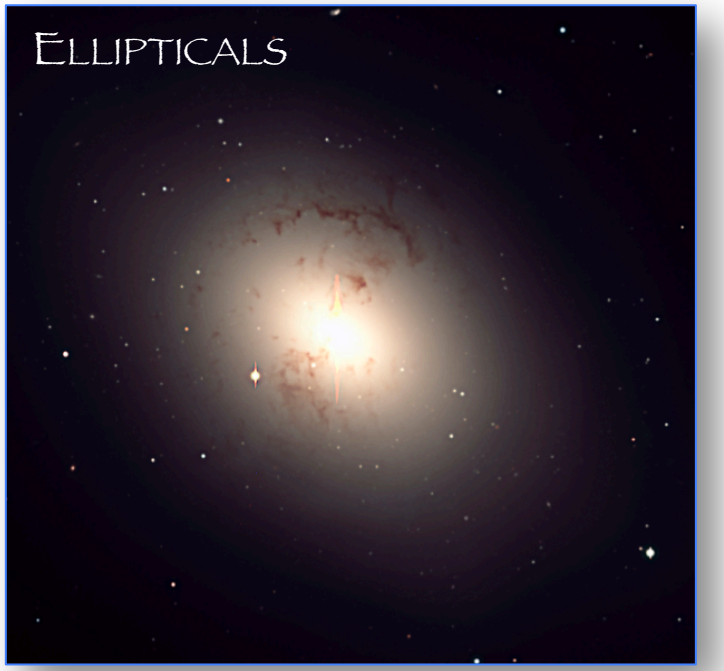
Hickox et al. (2012, MNRAS, 421, 284)

Strong clustering

$M_{halo} \sim 10^{13}\ M_\odot$

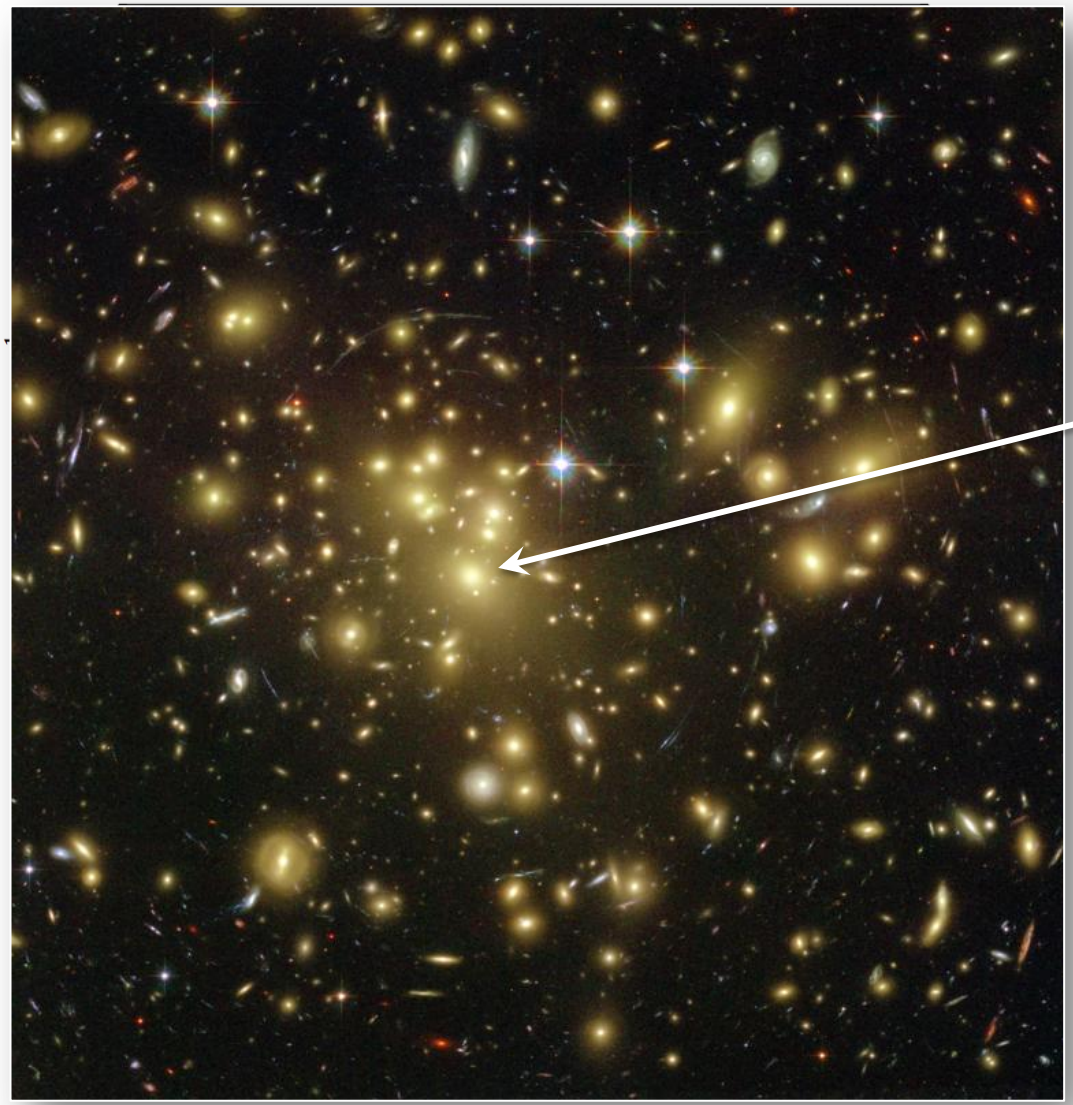
Clustering of dusty galaxies

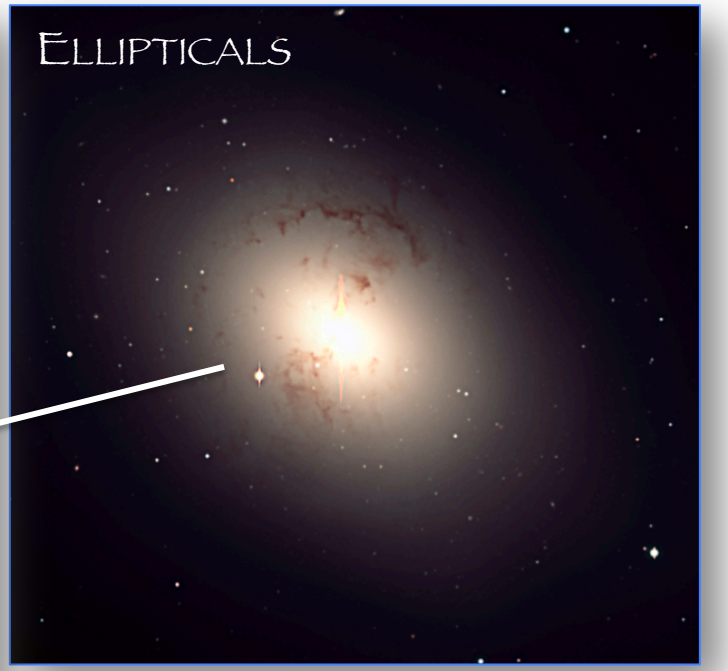




Hickox et al. (2012, MNRAS, 421, 284)

Clustering of dusty galaxies



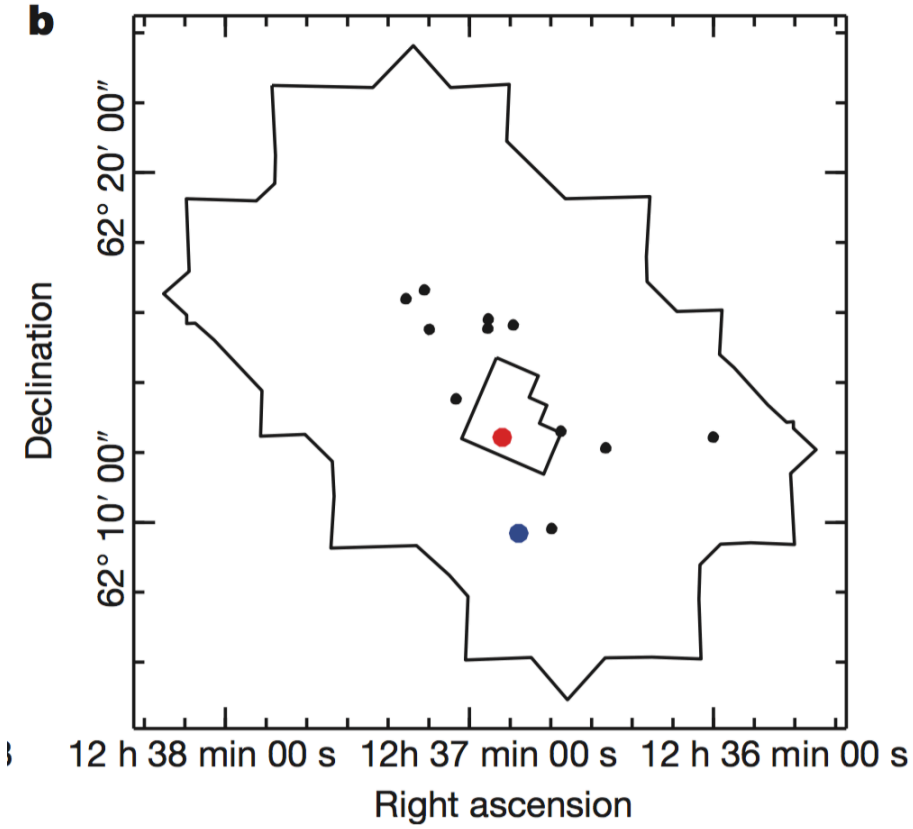


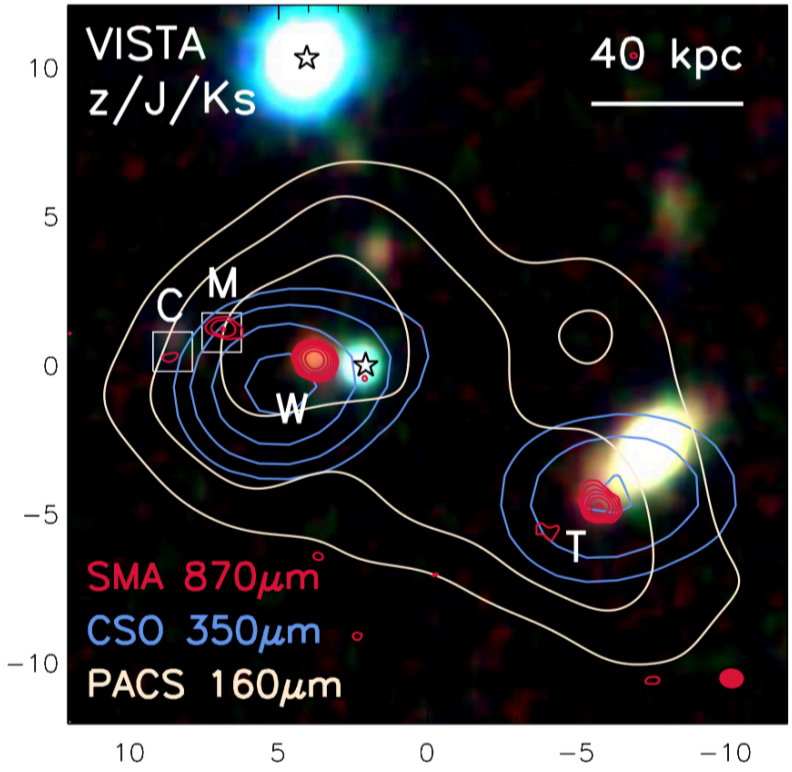
Dusty proto-clusters

SCUBA (Walter et al. 2012, Daddi et al. 2009), **AzTEC** (Kapac et al. 2011)

Herschel (Ivison et al. 2013), ***Herschel*** + ***Planck*** (Clements et al. 2014)

Planck (Planck intermediate results XXVII, 2015)

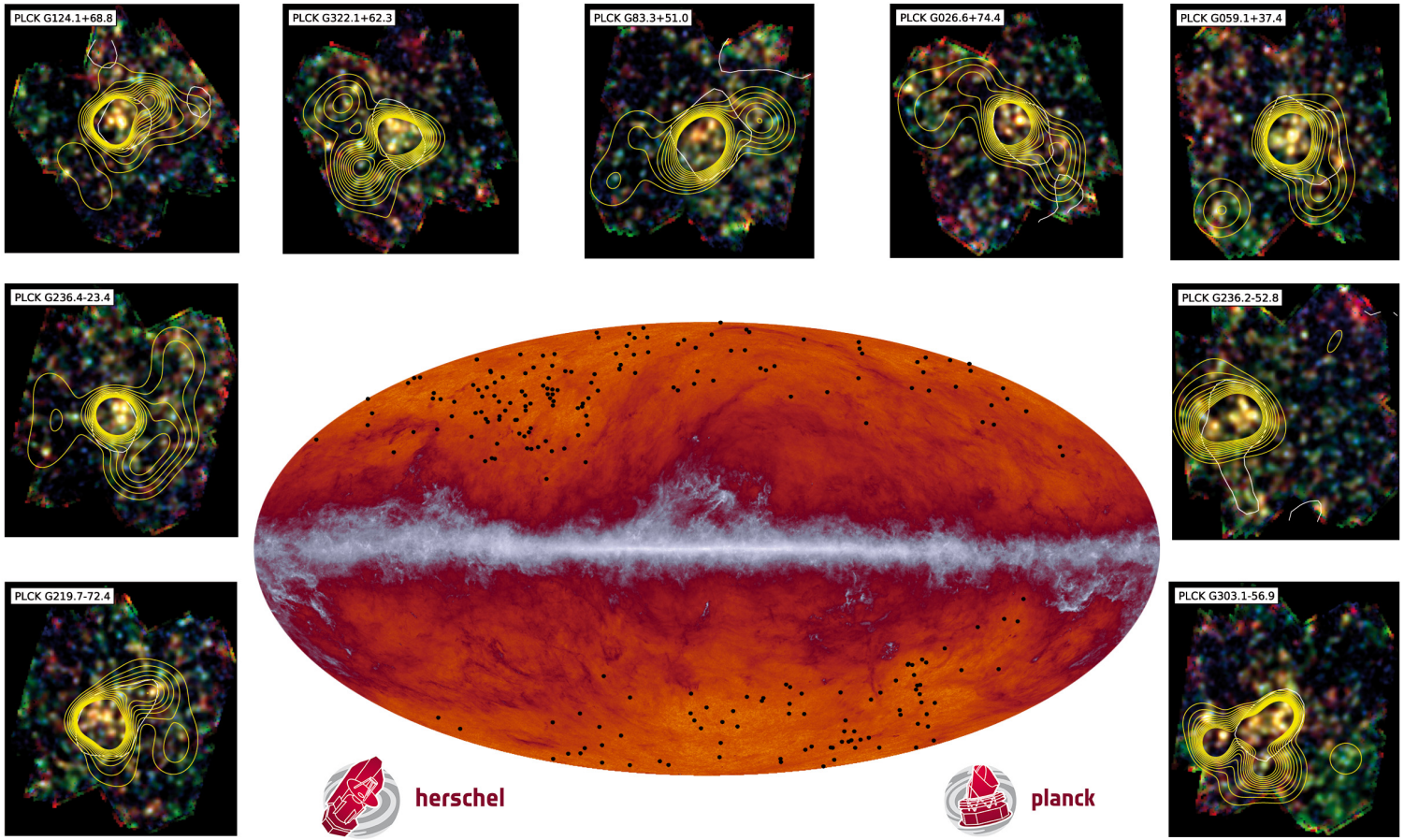




Dusty proto-clusters

Planck collaboration XXXIX (2016, arXiv:1508.04171):

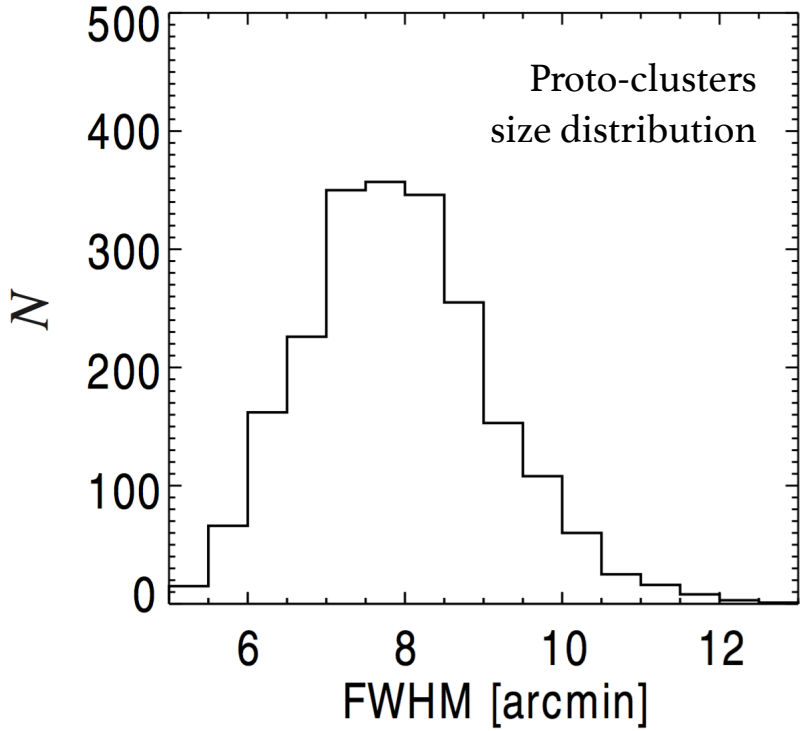
2151 candidate proto-clusters over 26% of the sky



Planck intermediate results XXVII (2015, A&A, 582, A30)

Dusty proto-clusters

SMI FoV (10'×10') is perfectly suited to map the proto-clusters



SPICA will

- Identify the proto-cluster members and measure their redshift (e.g. PAH)
- Confirm the LS structure/structures
- Study both SF and AGN activity in these dense environments

Conclusions

SPICA will help to understand

- Clustering of dusty galaxies down to L_{IR}~10^{11} $L_{\odot}$, out to z~4, and as a function of AGN activity

- SFR vs AGN activity in early stages of the formation of massive galaxy clusters