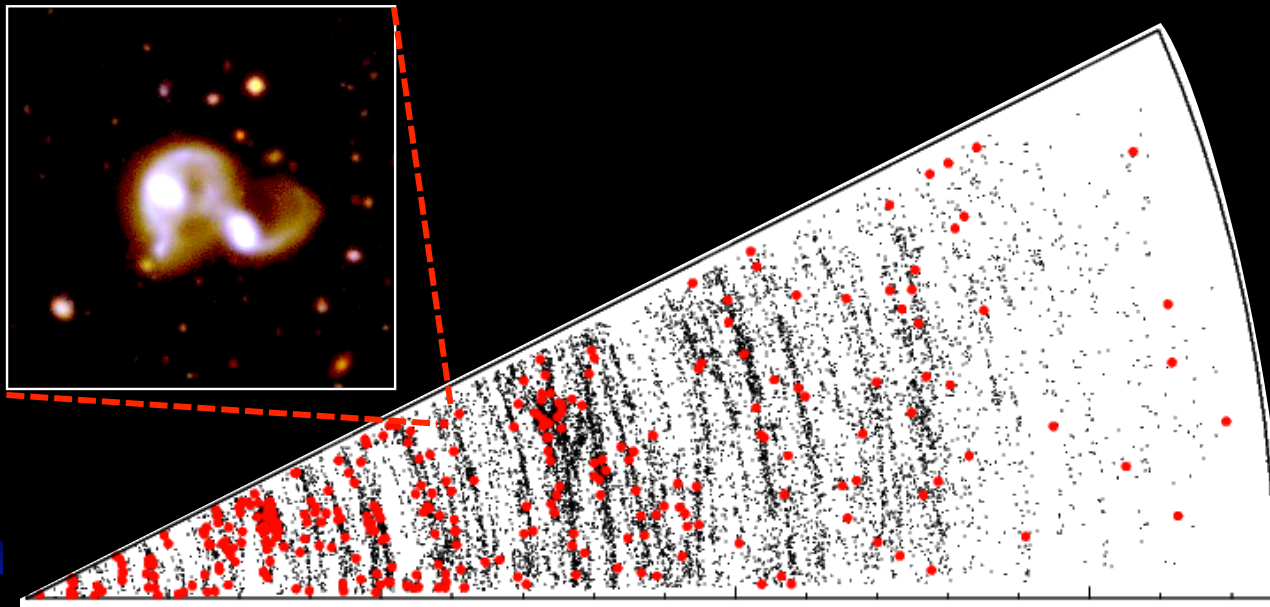


Infrared Bright Galaxies in Galaxy Redshift Surveys



Ho Seong HWANG¹,

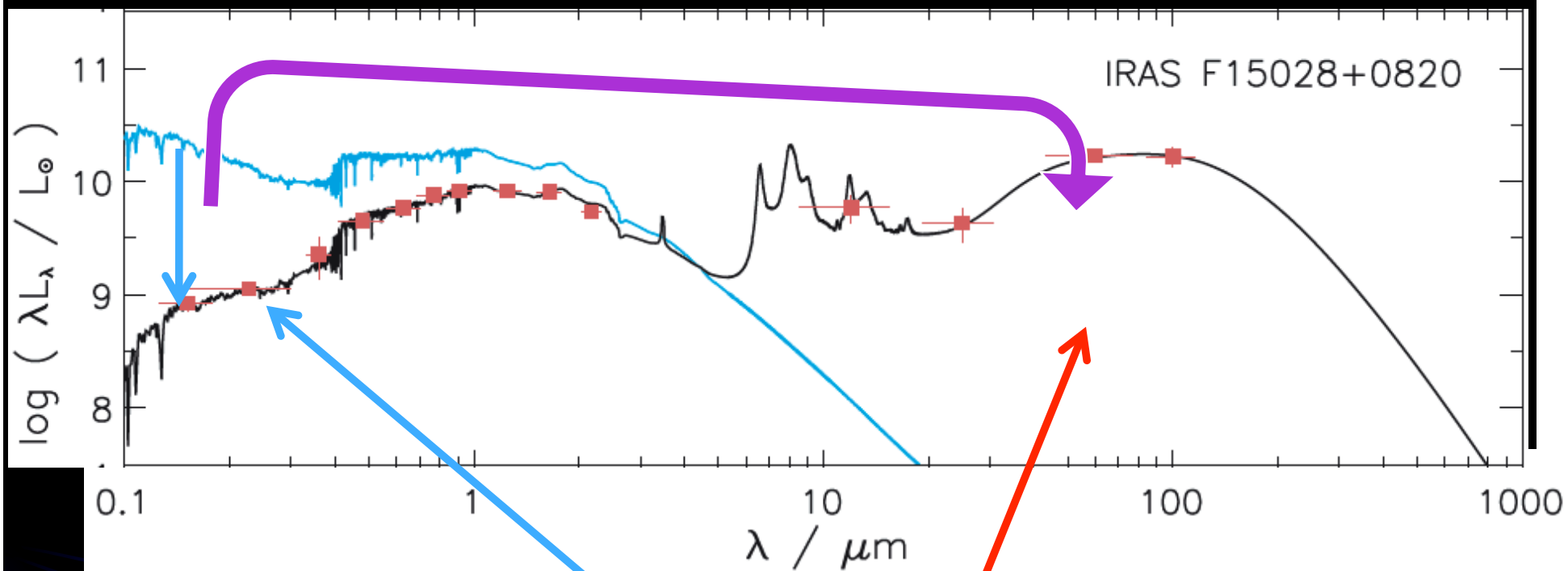
Margaret J. Geller¹, Michael J. Kurtz¹, Ian P. Dell'Antonio², Daniel G. Fabricant¹

¹SAO, ²Brown University

2012 November 1

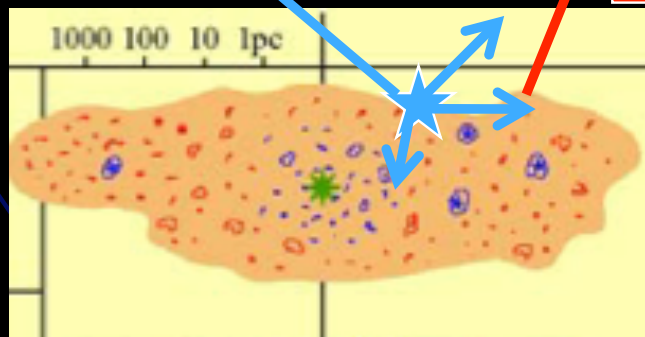
The 5th KIAS Workshop on Cosmology and Structure Formation

When Galaxies form Stars



UV

IR : Dust
heated by UV

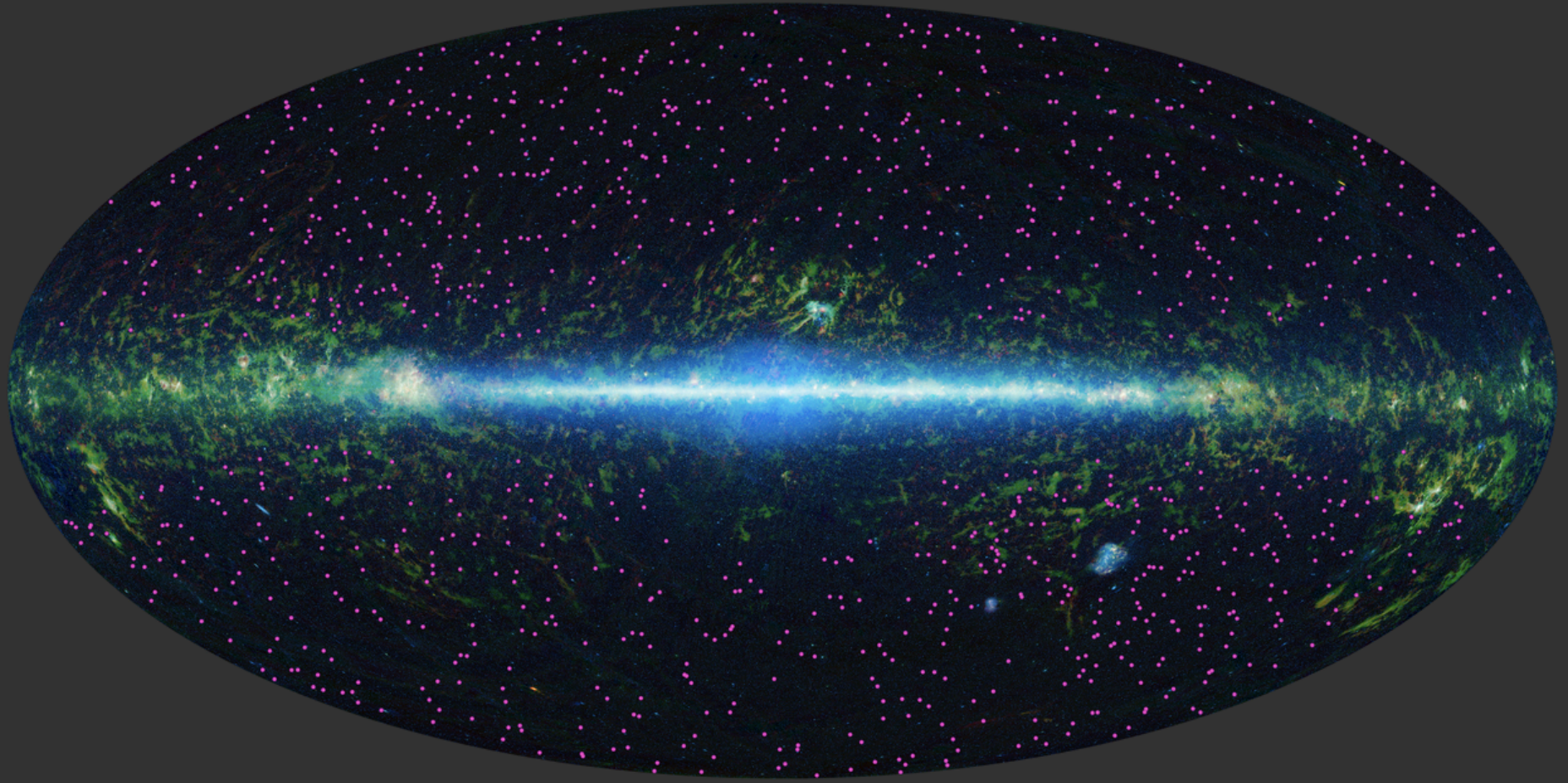


Important role of Dusty galaxies - Cosmic Star Formation Rate Density



Takeuchi+05; Bouwens+10

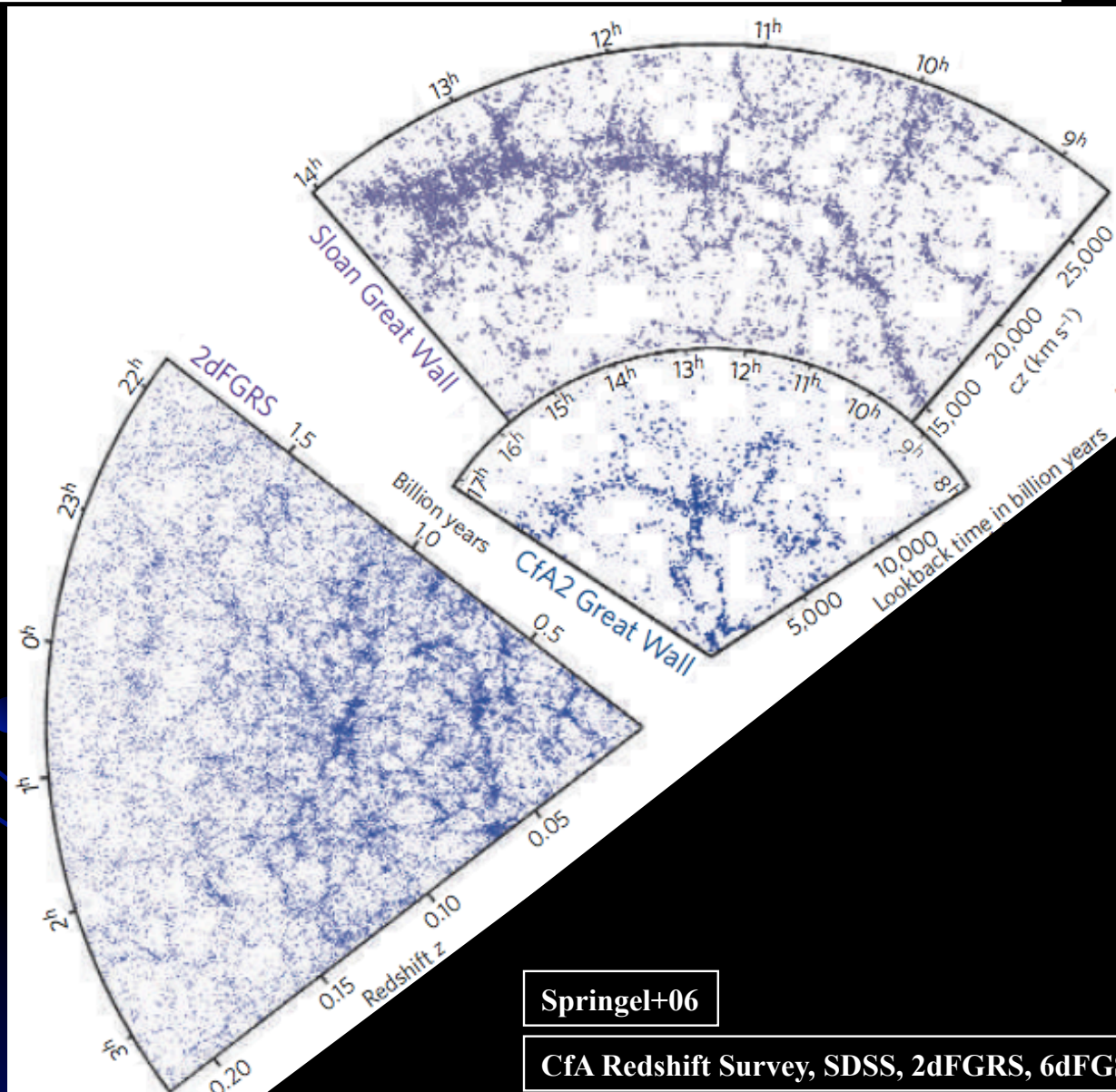
Infrared Surveys



WISE All sky (hot DOGs)

- IRAS, AKARI, WISE, ...
- ISO, Spitzer, Herschel, SPICA, JWST, ...

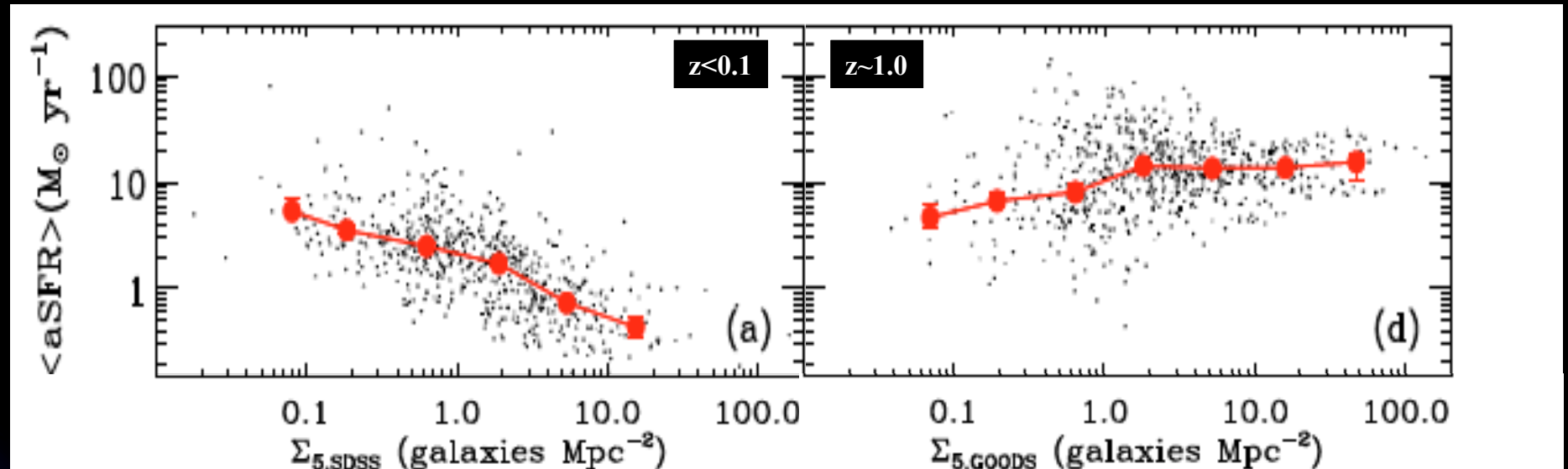
Redshift Surveys



Springel+06

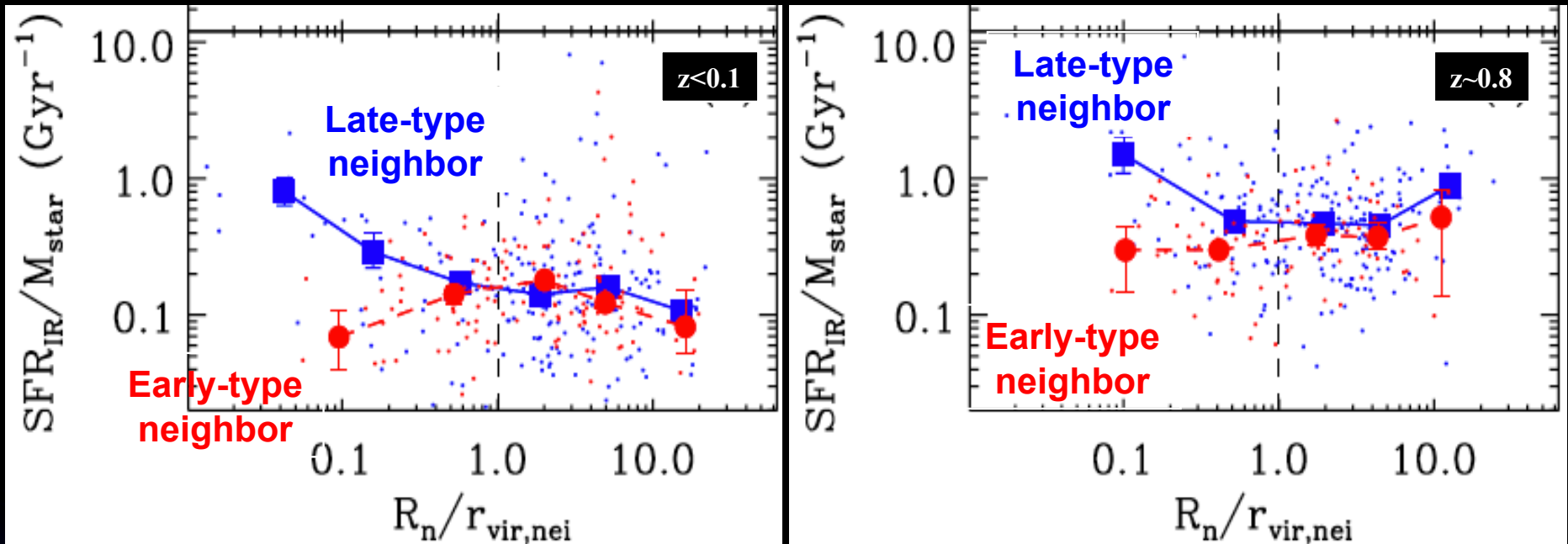
CfA Redshift Survey, SDSS, 2dFGRS, 6dFGS, ...

Combination of IR and Redshift Surveys



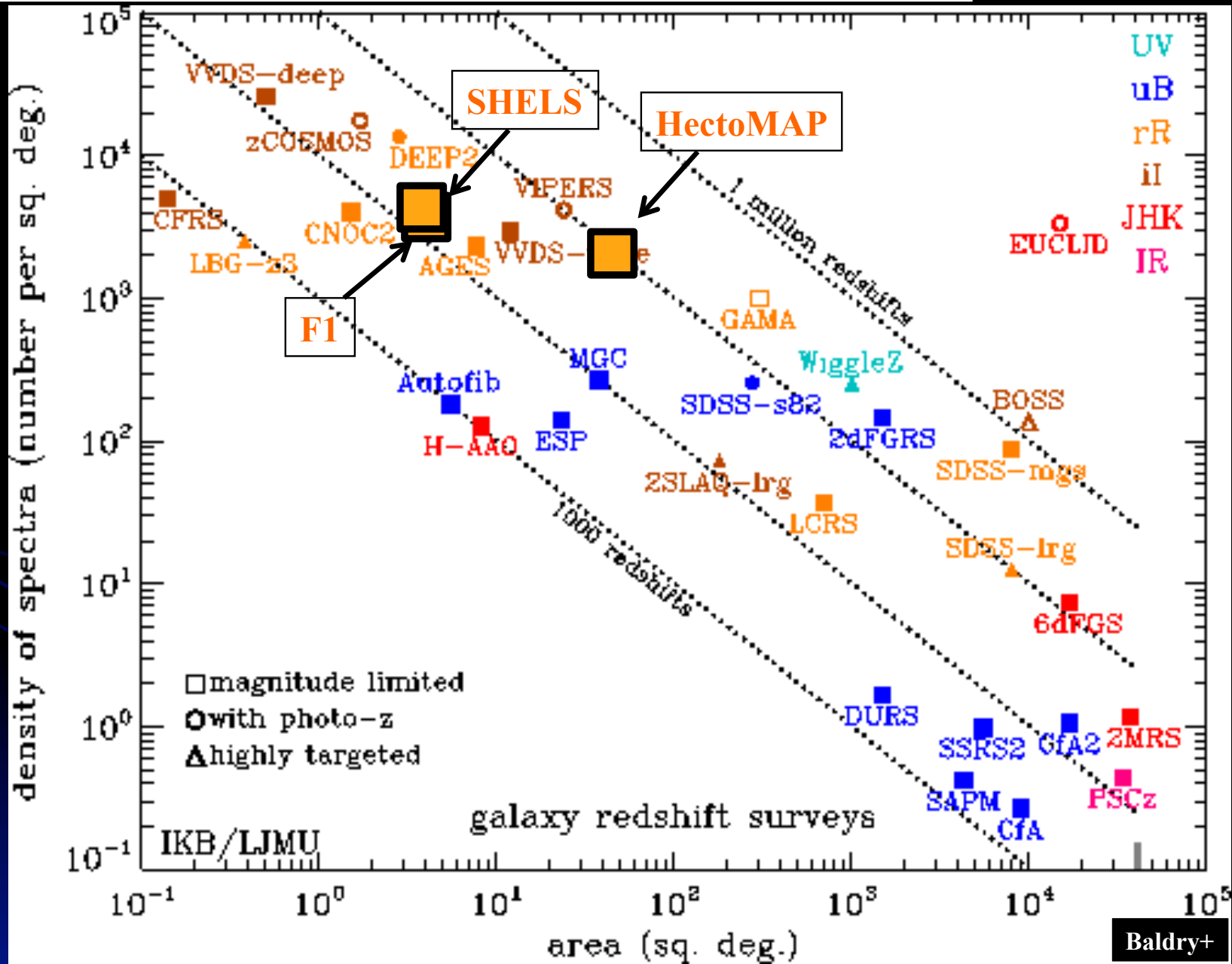
Reversal of SFR-Density relation
(Elbaz+07; Hwang+10)

Combination of IR and Redshift Surveys

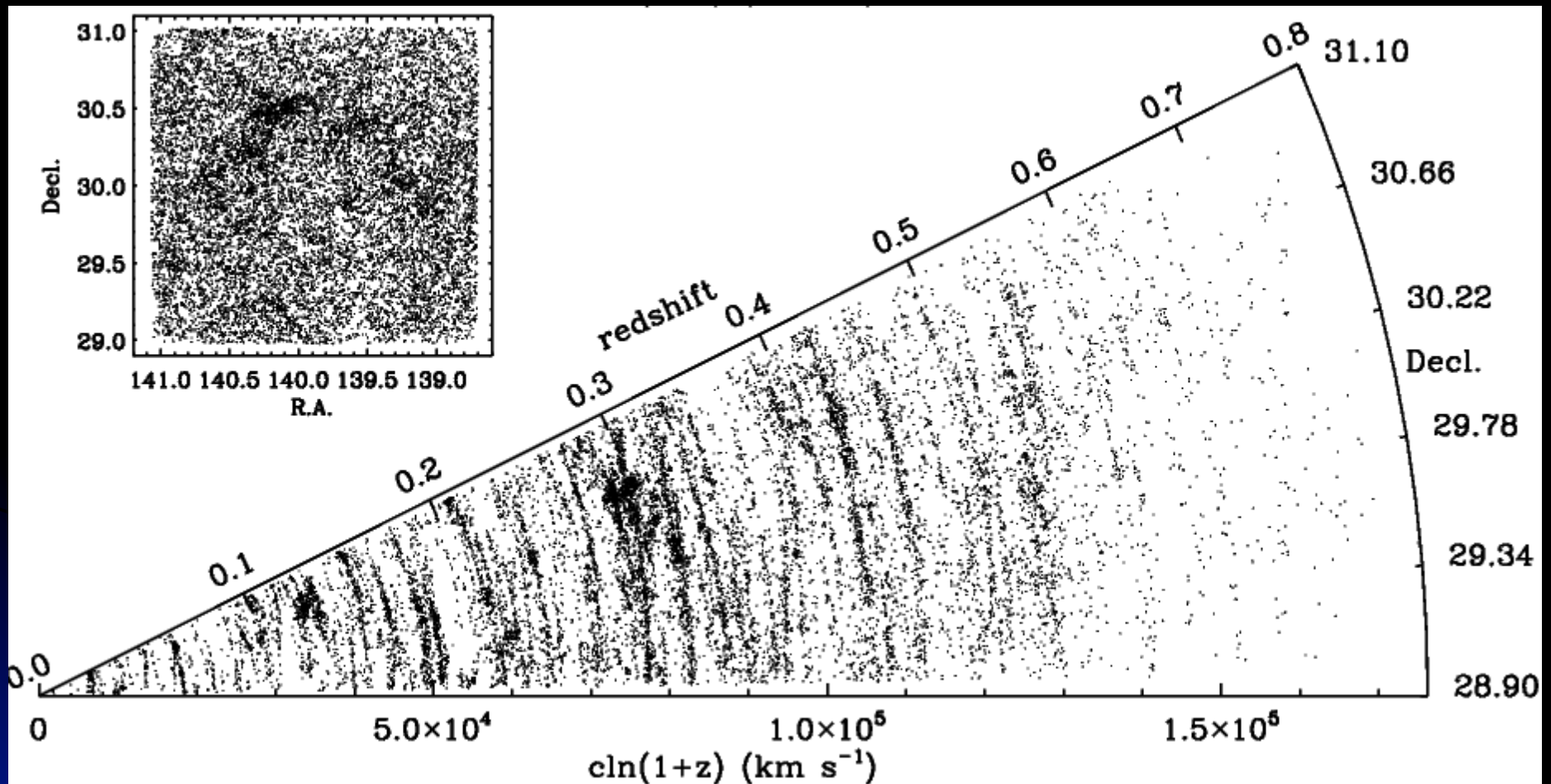


Important Role of Nearest neighbor galaxies
Hwang+11 (Geller+06; Park & Choi 09)

Current Galaxy Redshift Surveys

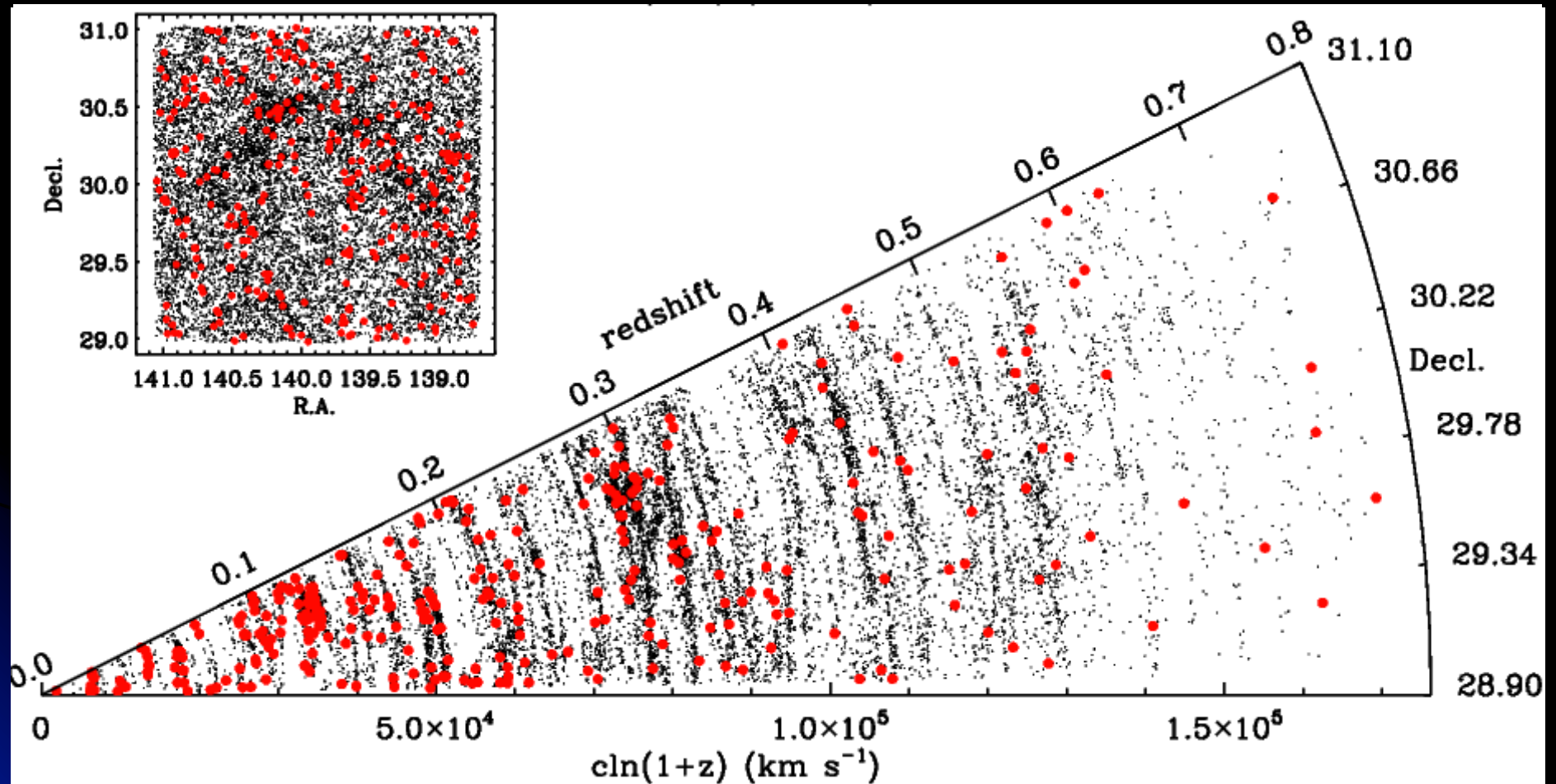


SHELS: Smithsonian Hectospec Lensing Survey



Geller+05;10;12

SHELS: Smithsonian Hectospec Lensing Survey



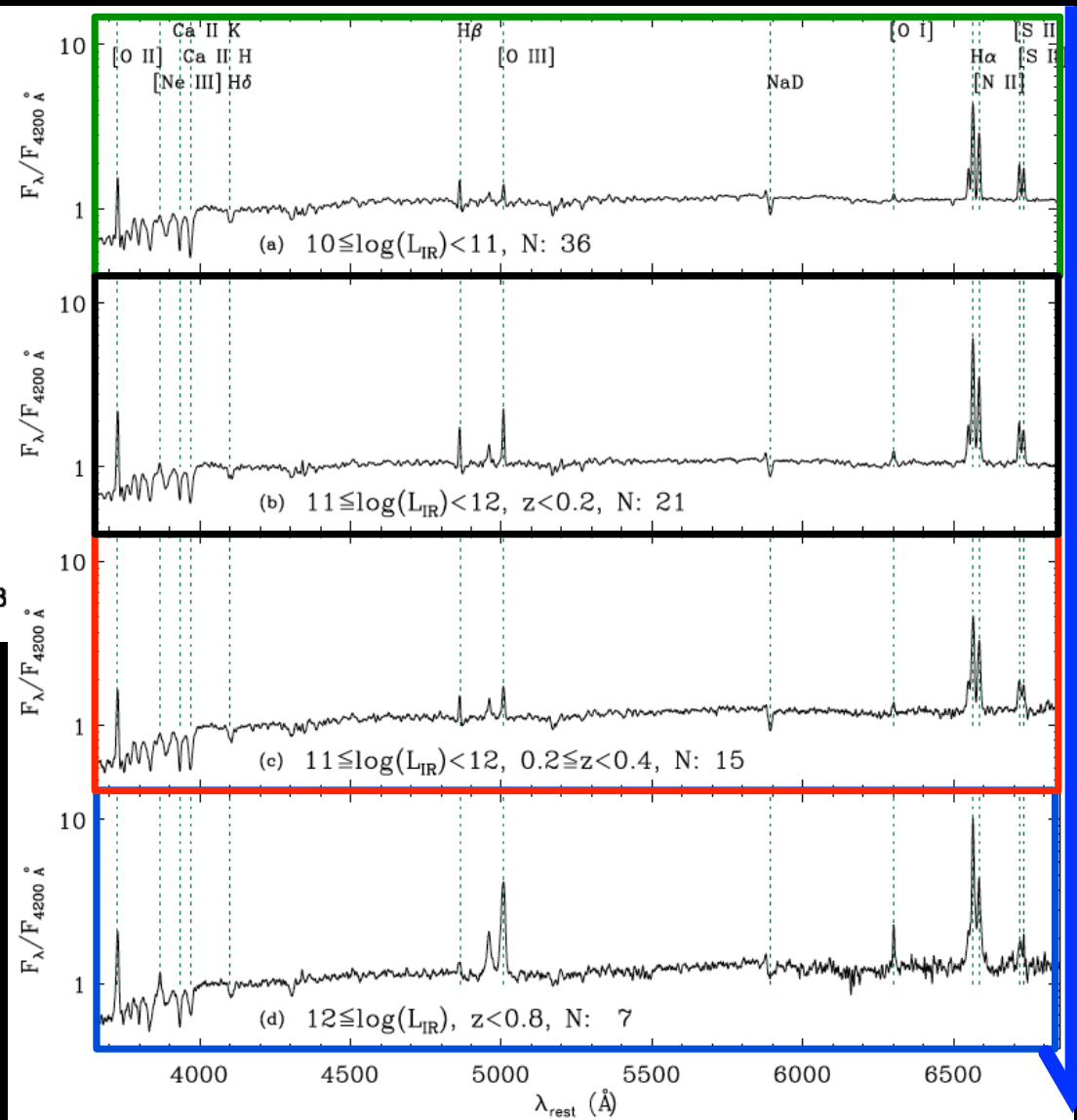
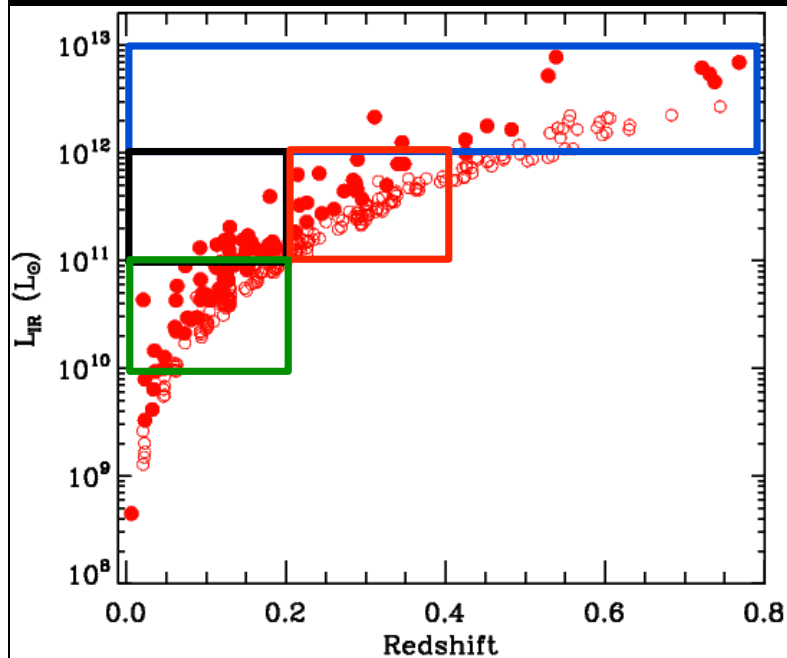
WISE 22 μm selected Galaxies (Hwang+12)

➤ **Combination of IR (WISE) and Redshift (SHELS) Surveys**

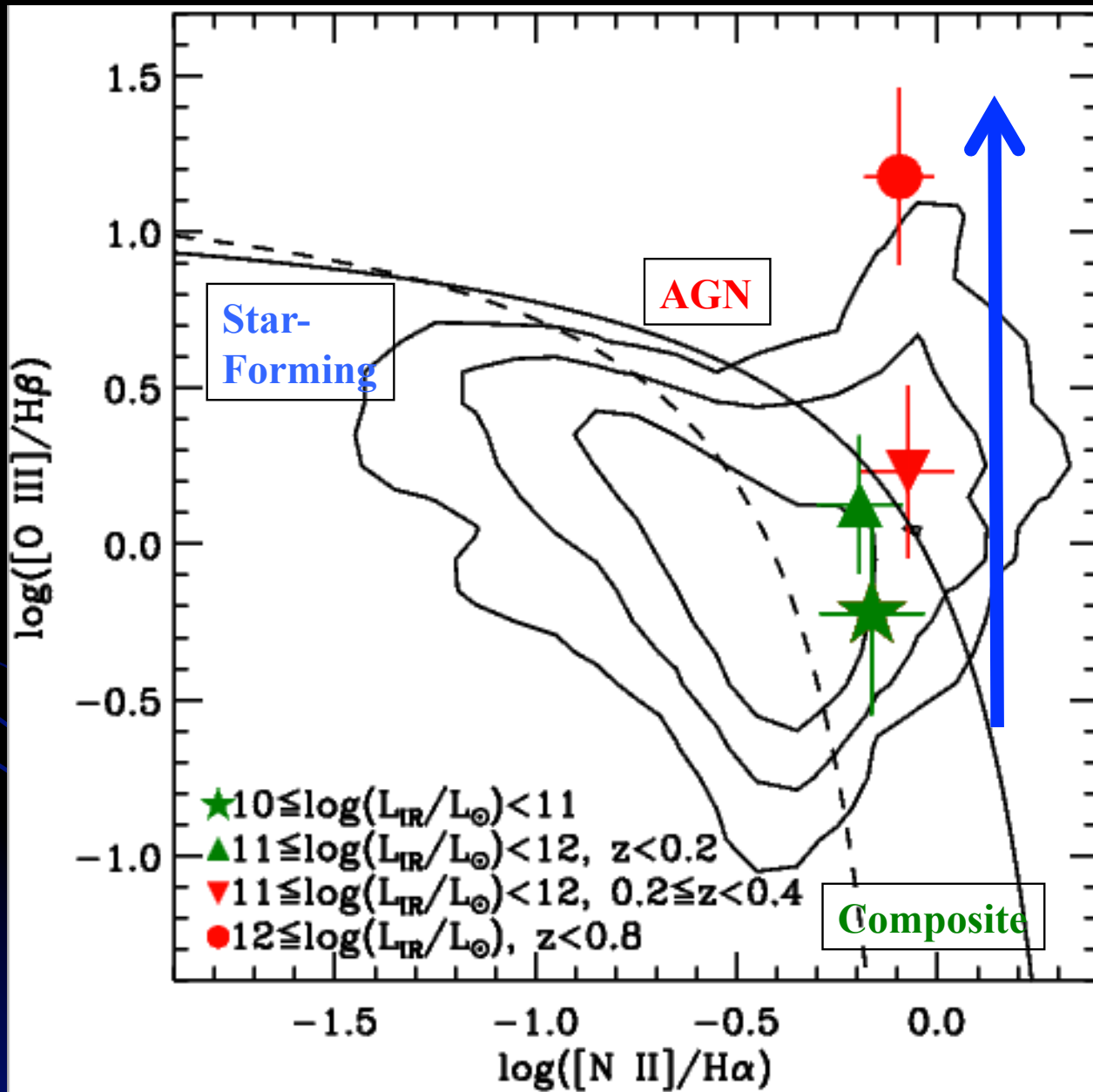
➤ **Interplay between AGN and SF activity**

➤ **What triggers their activity through cosmic time
(Evolution of environmental effects)**

WISE 22 μm selected Galaxies with redshifts

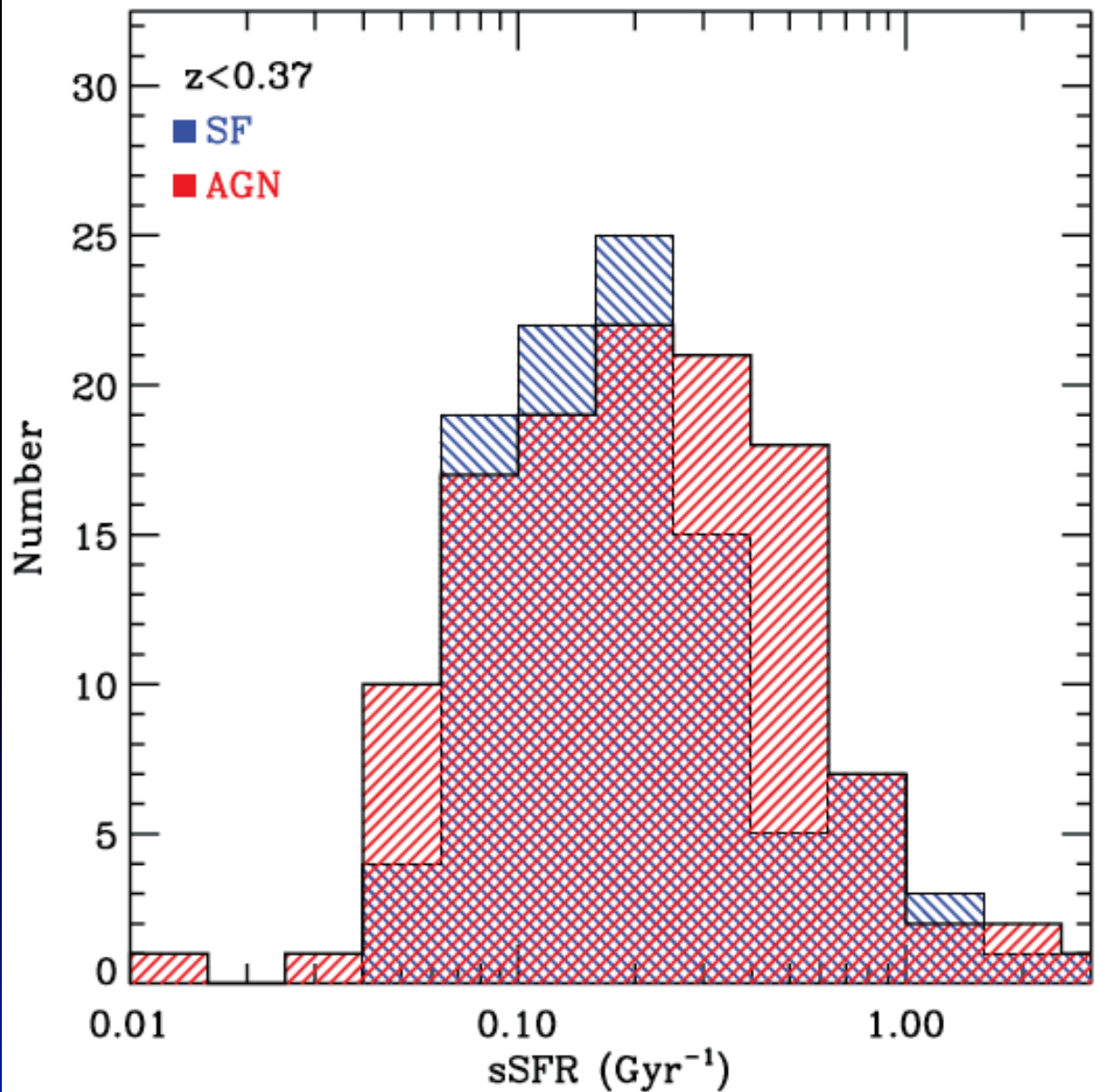


WISE 22 μm selected Galaxies with redshifts



Hwang+12
(Also Veilleux+95,02;
Yuan+10; Hwang+10)

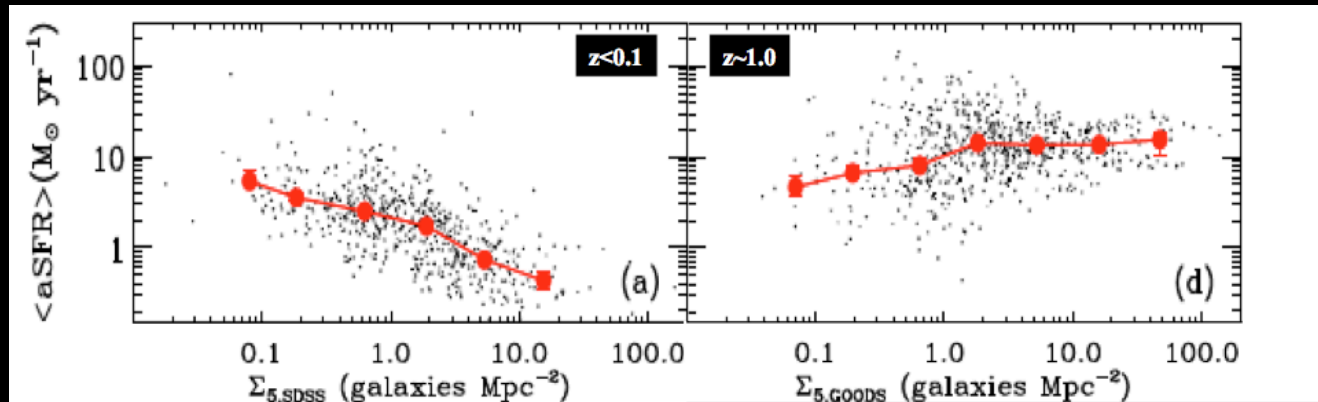
AGN vs. Star-forming Galaxies



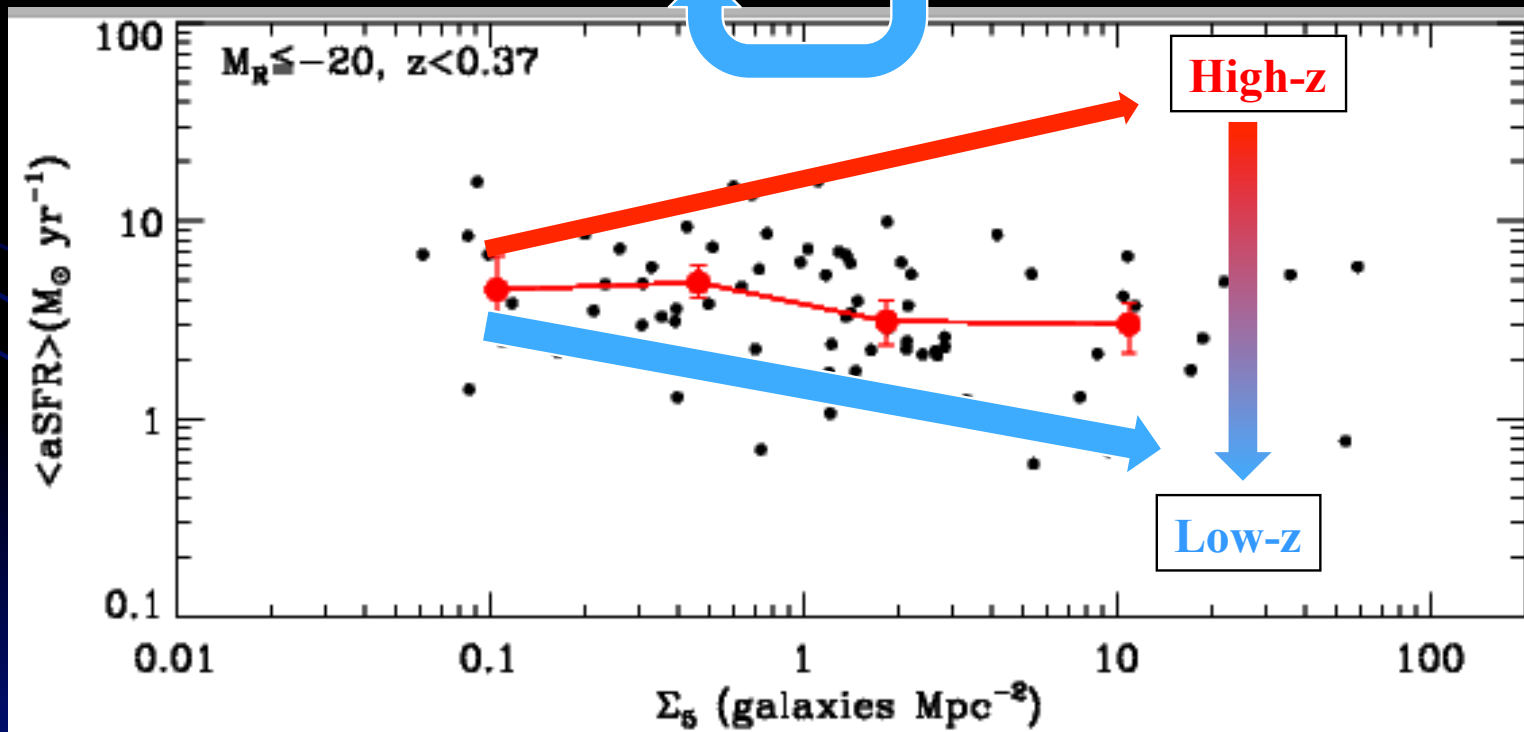
SF ← AGN

- Suppress?
(Ho 2005; Page+12)
- Increase?
(Gu+06; Rovilos+12)
- No difference?
(Silverman+09; Mullaney+12)

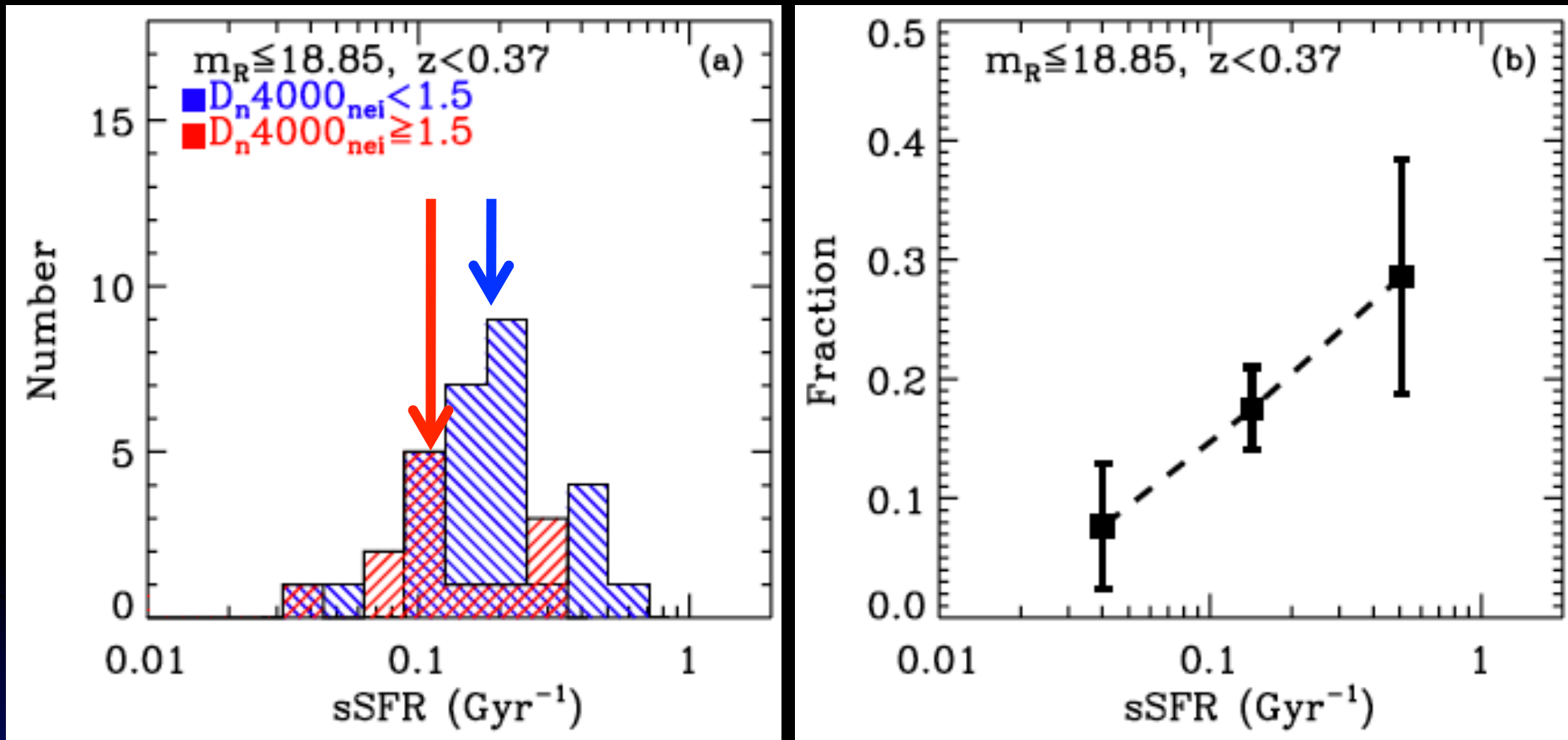
Combination of IR and Redshift Surveys



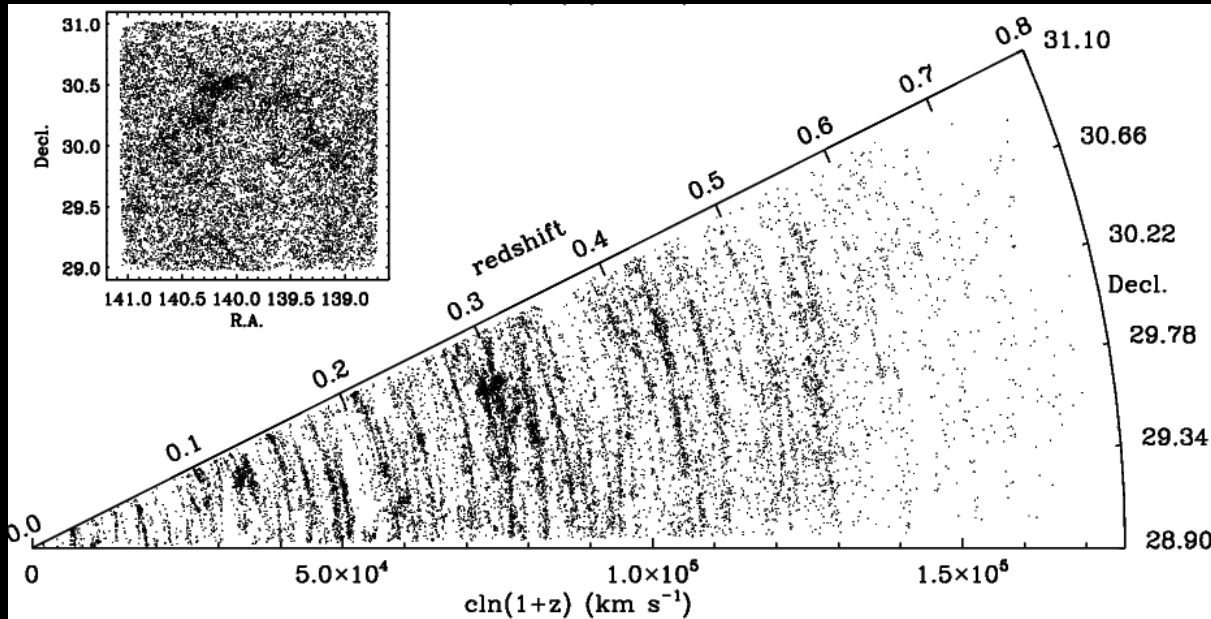
Reversal of SFR-Density relation
(Elbaz+07; Hwang+10)



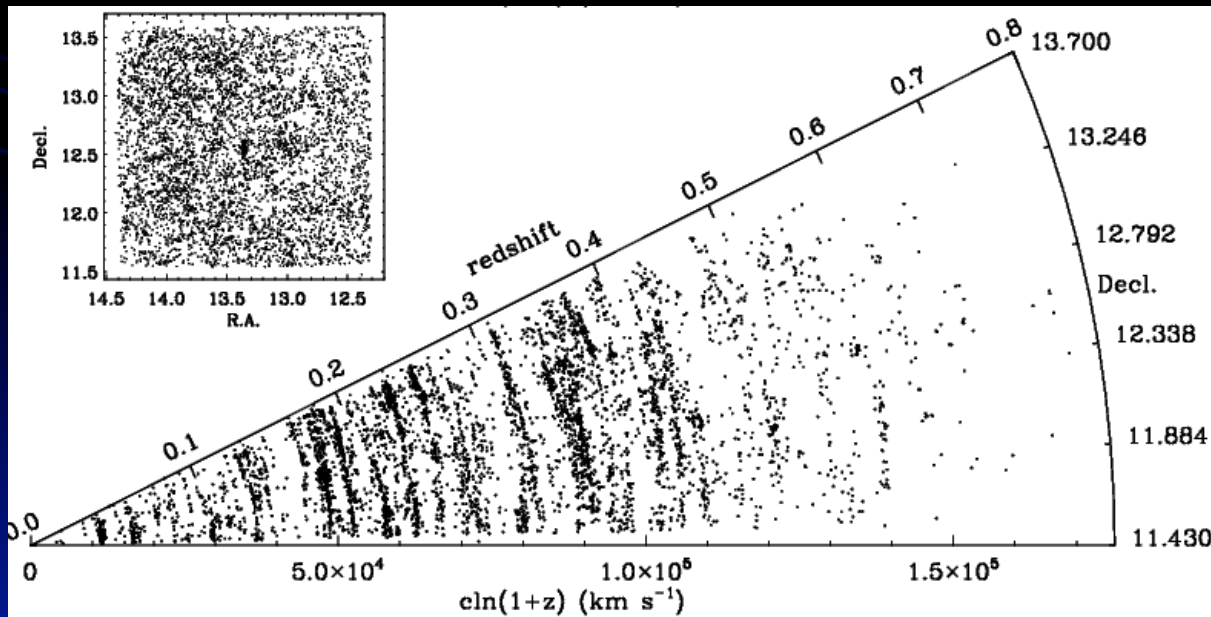
Role of the Nearest Neighbor Galaxy in Changing sSFR



Cosmic Variance – More Large Fields



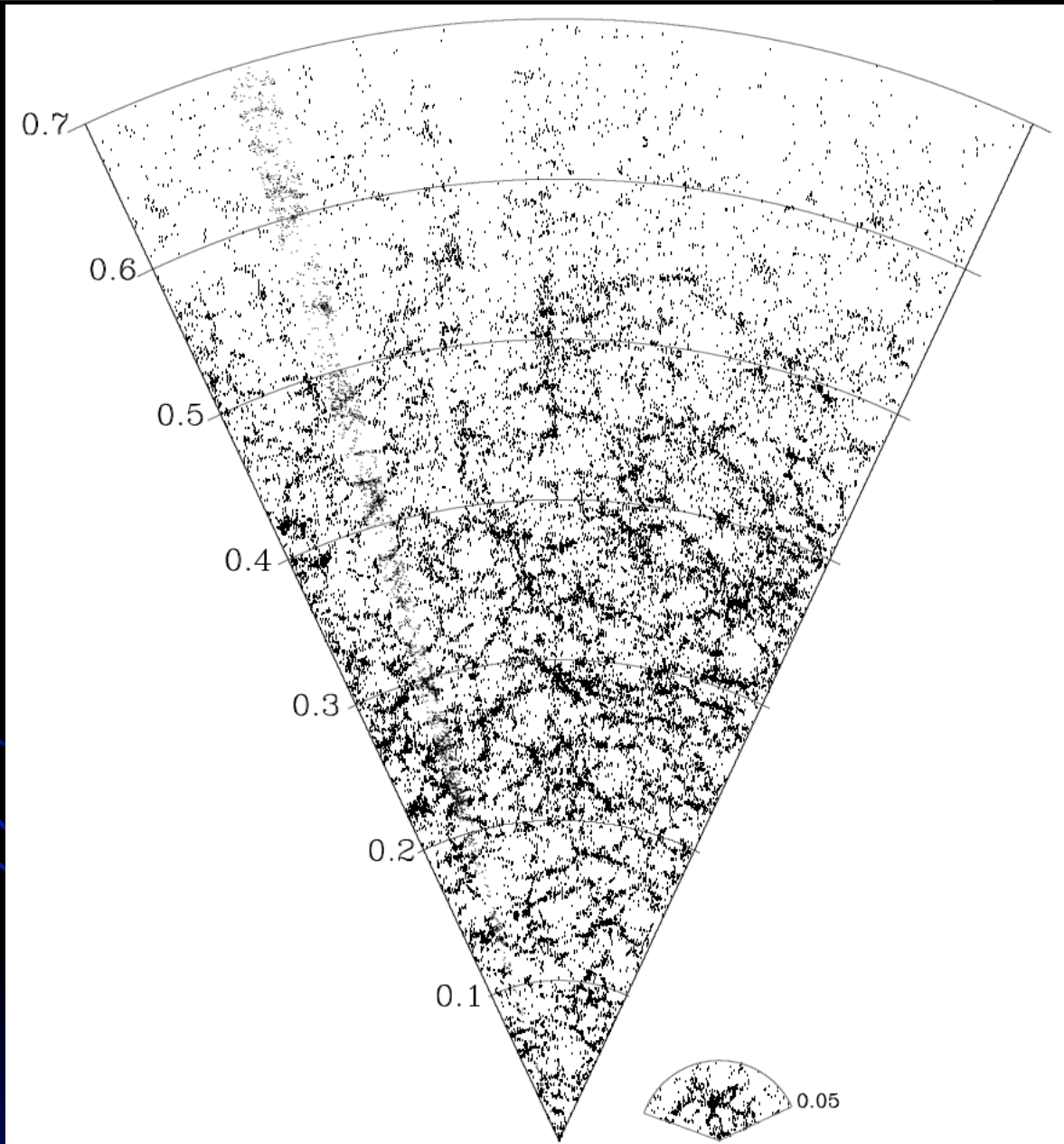
SHELs (DLS F2 field)



F1: another 4 deg² DLS field



Cosmic Variance – More Large Fields



HectoMAP: 50 deg²
(Geller+11)

Conclusions

➤ **Combination of IR and Redshift Surveys**

- **What triggers their activity through cosmic time
(Evolution of environmental effects)**
- **Interplay between AGN and SF activity**

Thank you!