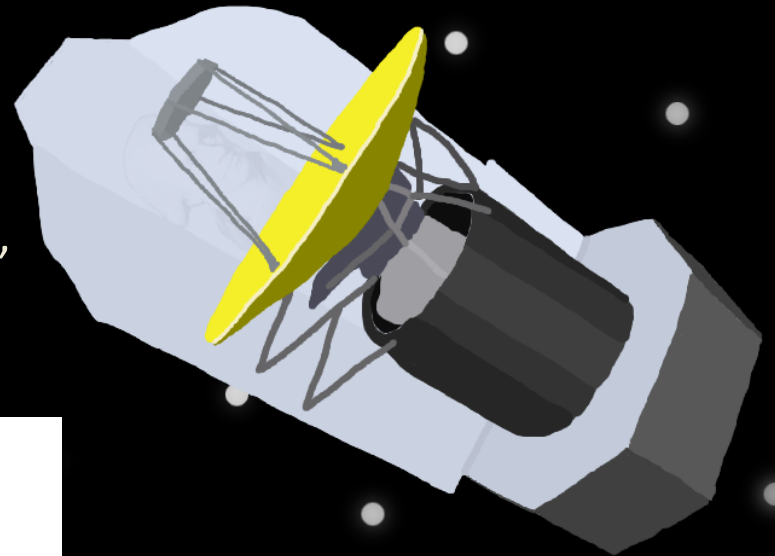


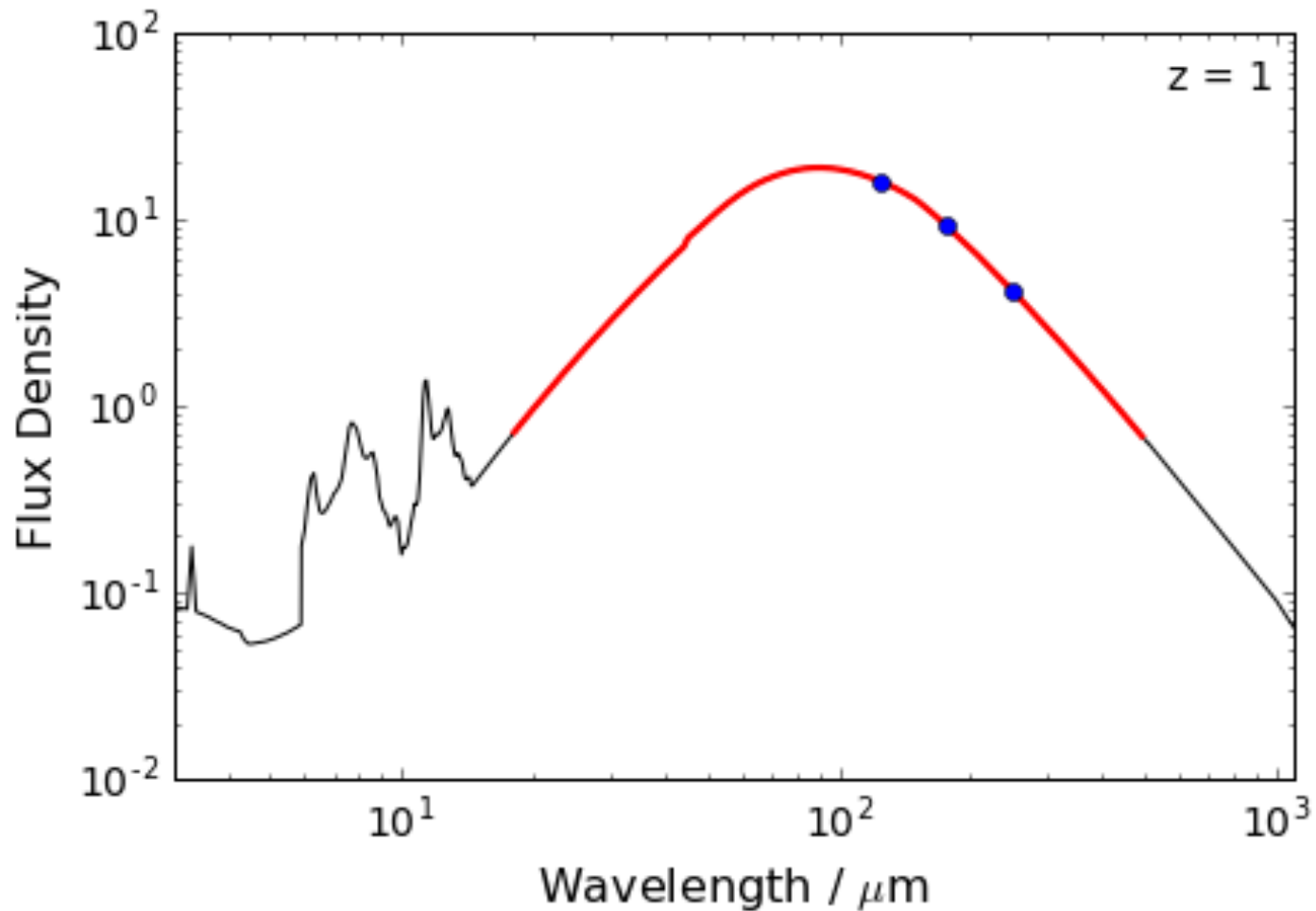
Beating Herschel's Confusion limit to explore the Galaxy Main Sequence

William J. Pearson (SRON)

L. Wang (SRON), P.D. Hurley (Sussex),
K. Małek (LAM), V. Buat (LAM),
D. Burgarella (LAM), D. Farrah (Virginia Tech),
S.J. Oliver (Sussex), D.J.B. Smith (Herts),
F.F.S. van der Tak (SRON)



Why even try?



Beating Confusion

Multi-wavelength input catalogue



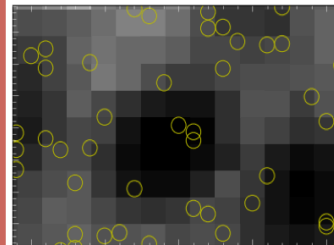
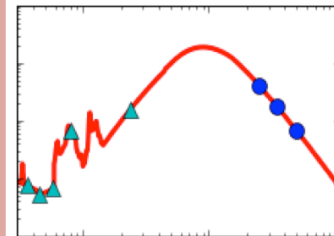
Use CIGALE to fit SEDs to the multi-wavelength data and predict the SPIRE flux densities



Using the CIGALE predictions as flux density priors to de-blend SPIRE maps in XID+



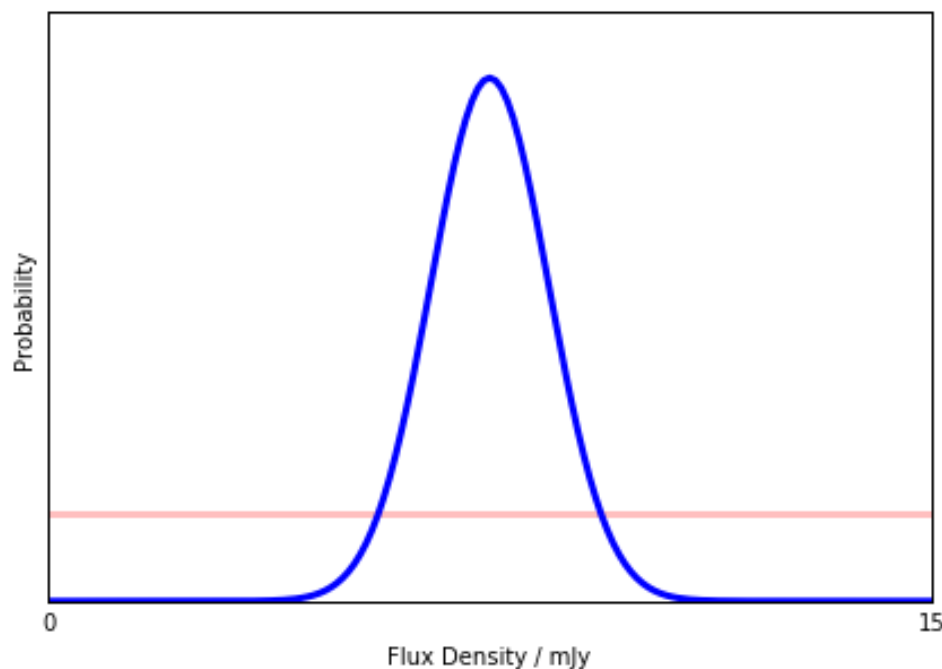
Id	FUV Flux	NUV Flux	...
0	1.26	1.3	237
...	1.53	1.1	175



XID+

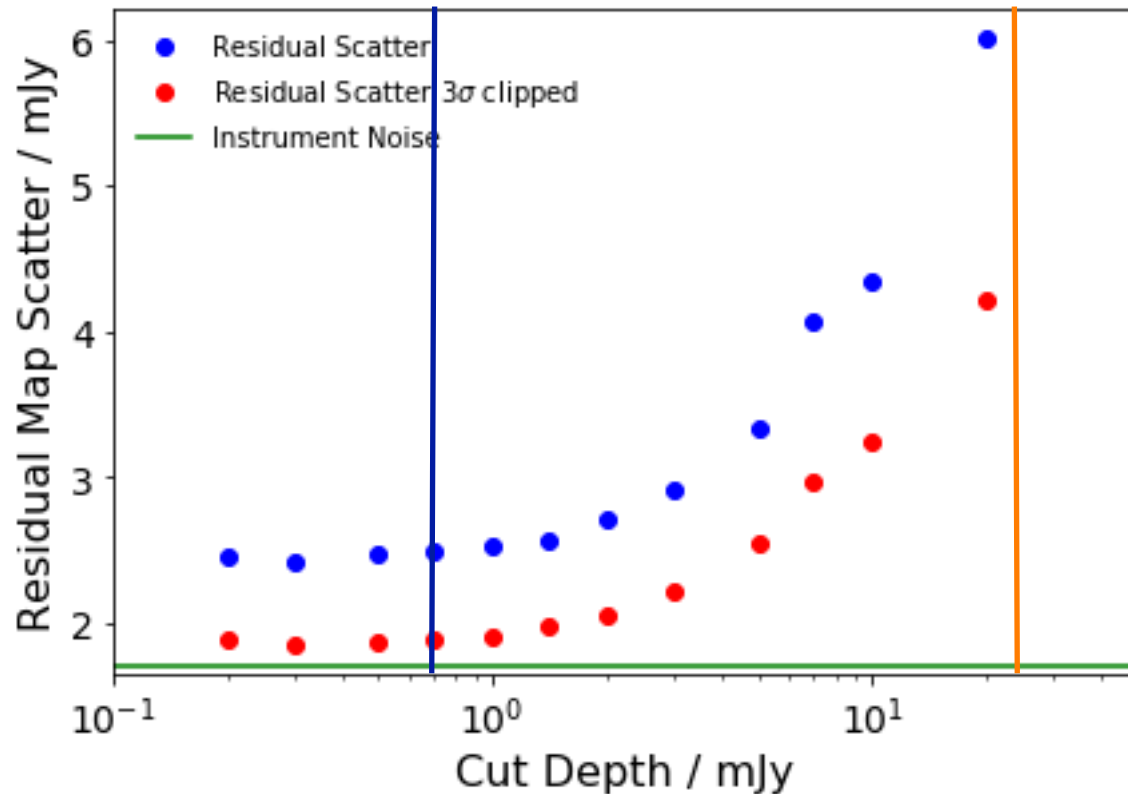
Hurley et al. 2017

- Bayesian De-blending tool
- Assigns fluxes to all objects in input catalogue
- Comes with a flat prior
- **We introduced an Informed Gaussian prior**

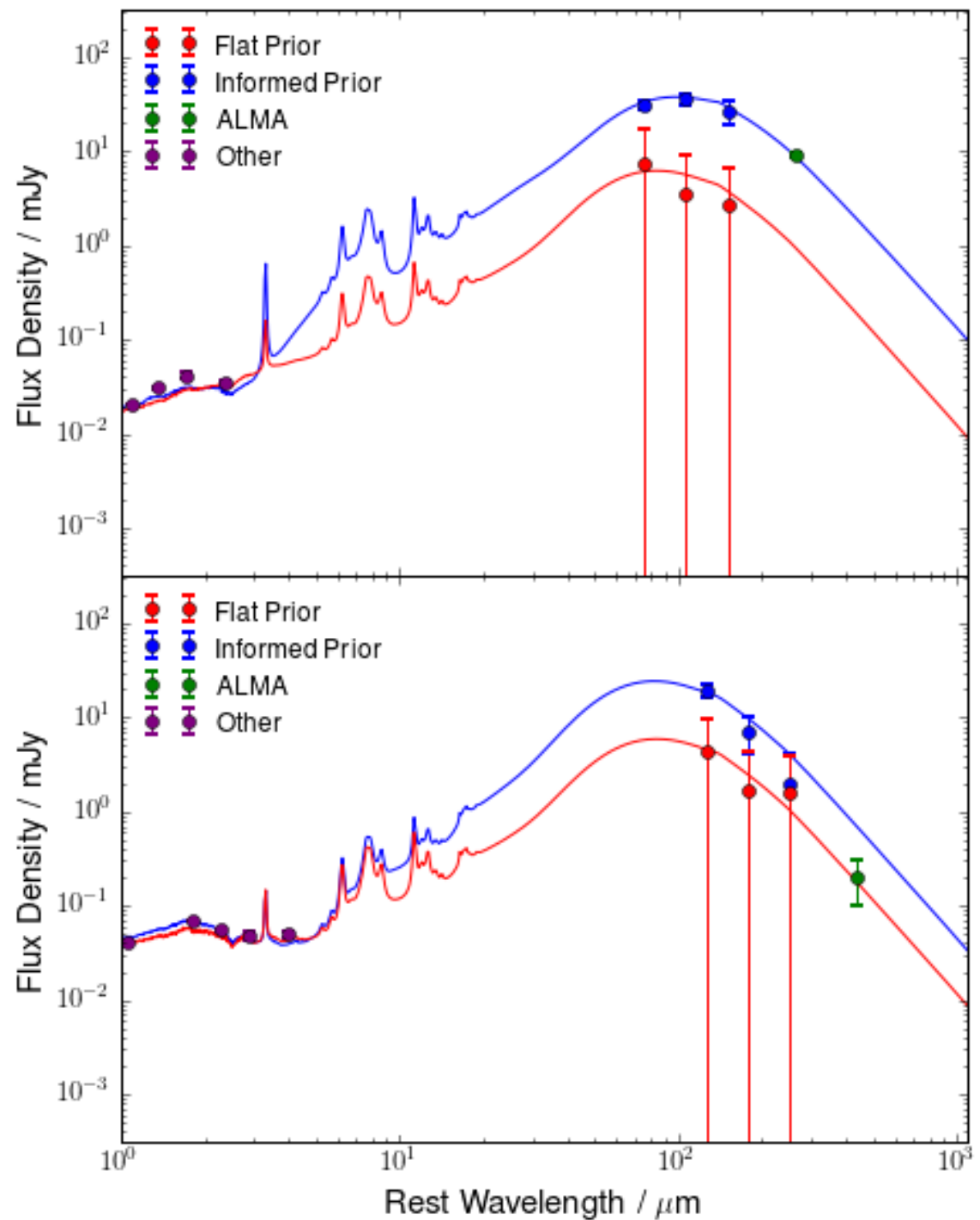


Pearson+ 2017

How deep can we go?



ALMA Comparison

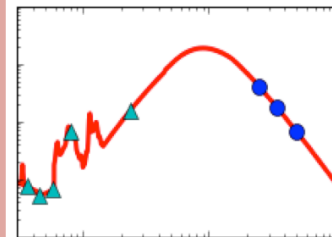


Beating Confusion

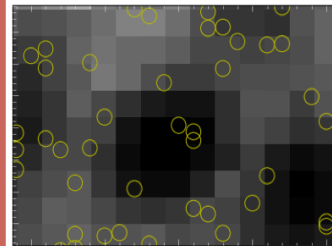
Multi-wavelength input catalogue

Id	FUV Flux	NUV Flux	...
0	1.26	1.3	237
...	1.53	1.1	175

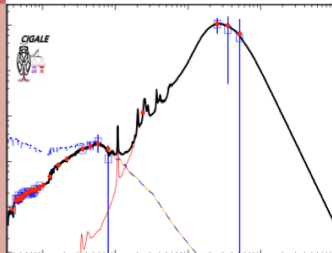
Use CIGALE to fit SEDs to the multi-wavelength data and predict the SPIRE flux densities



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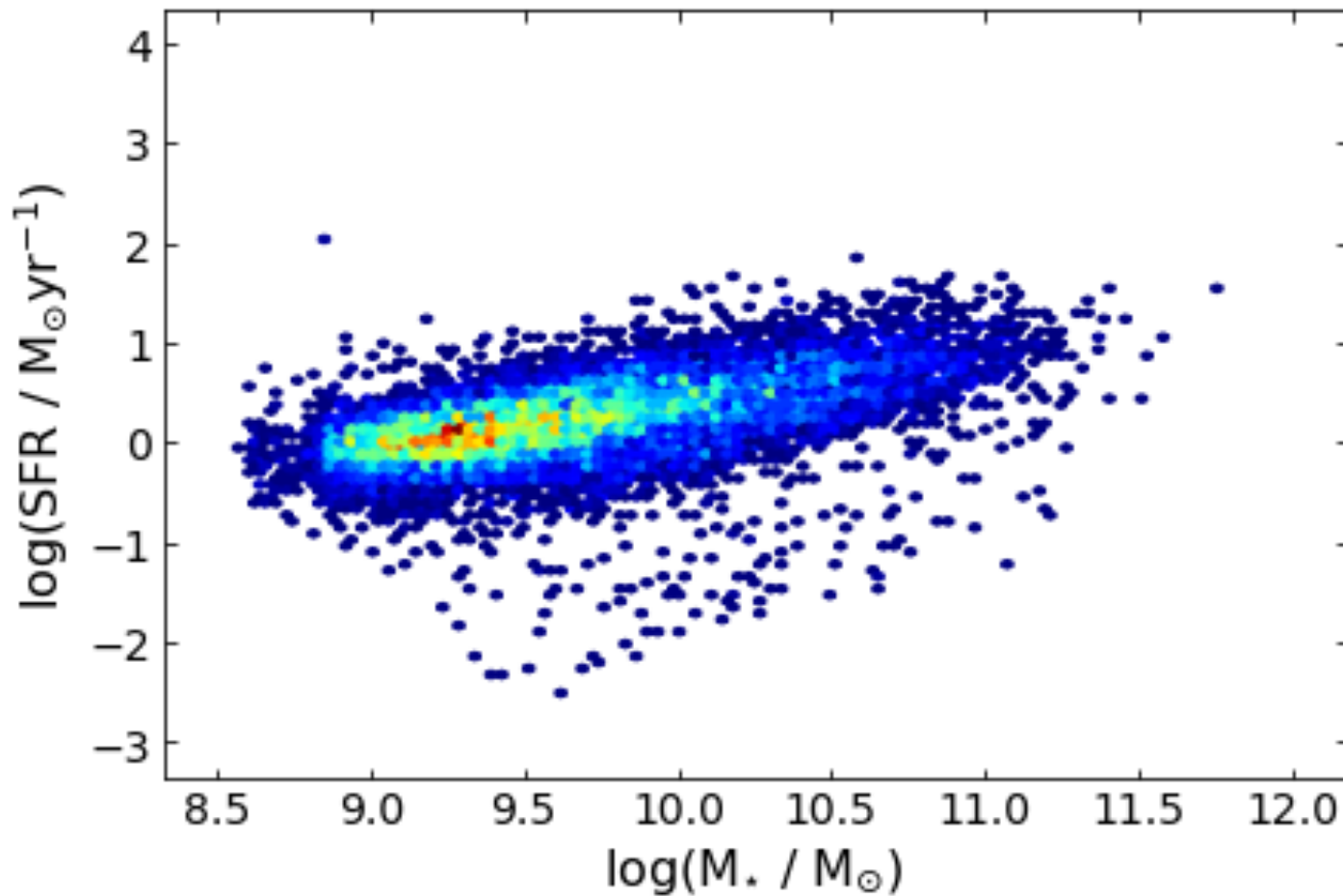


Use multi-wavelength data and de-blended SPIRE flux densities in CIGALE to derive M_* and SFR



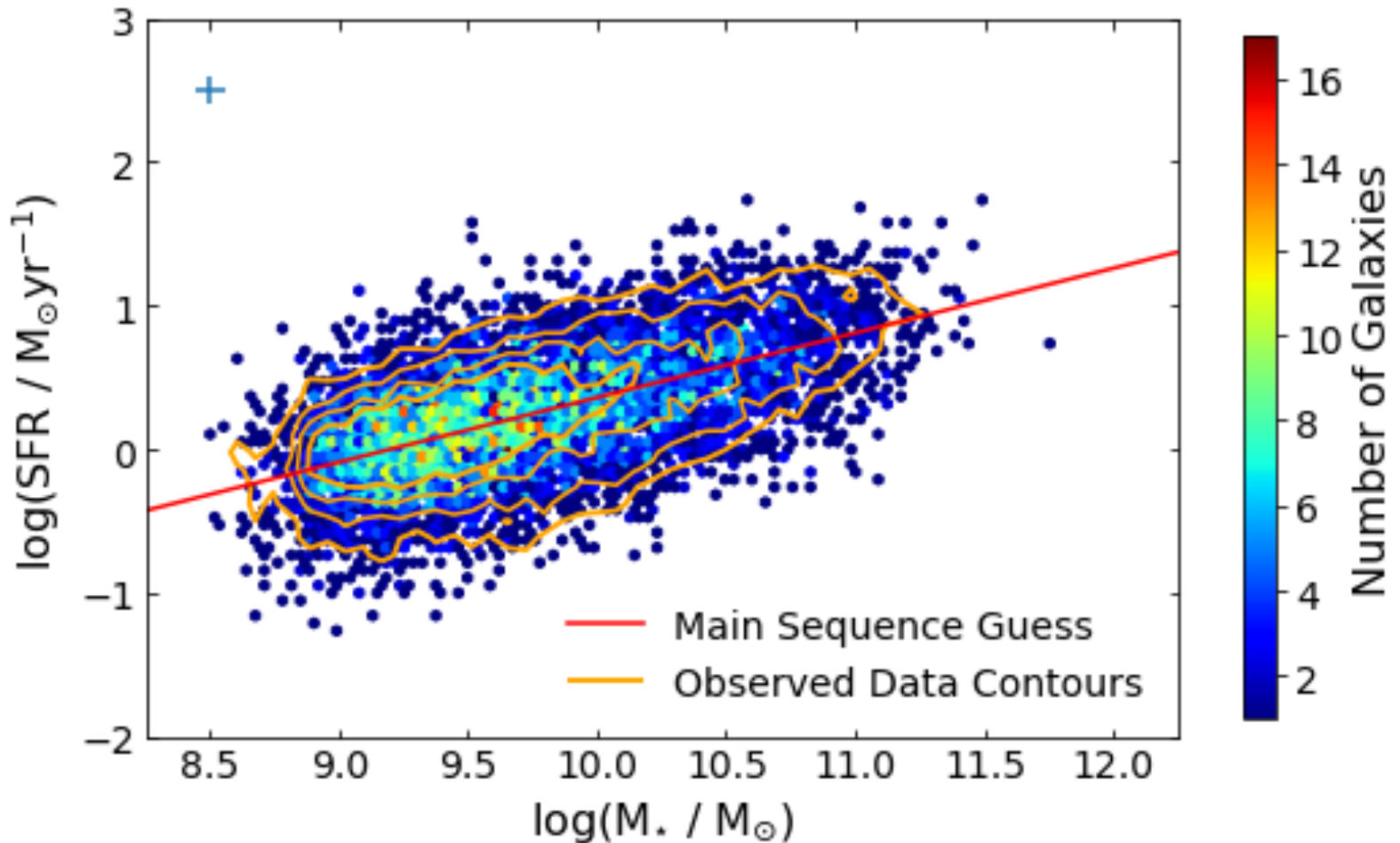
Pearson+ 2017

What is the 'Main Sequence'?

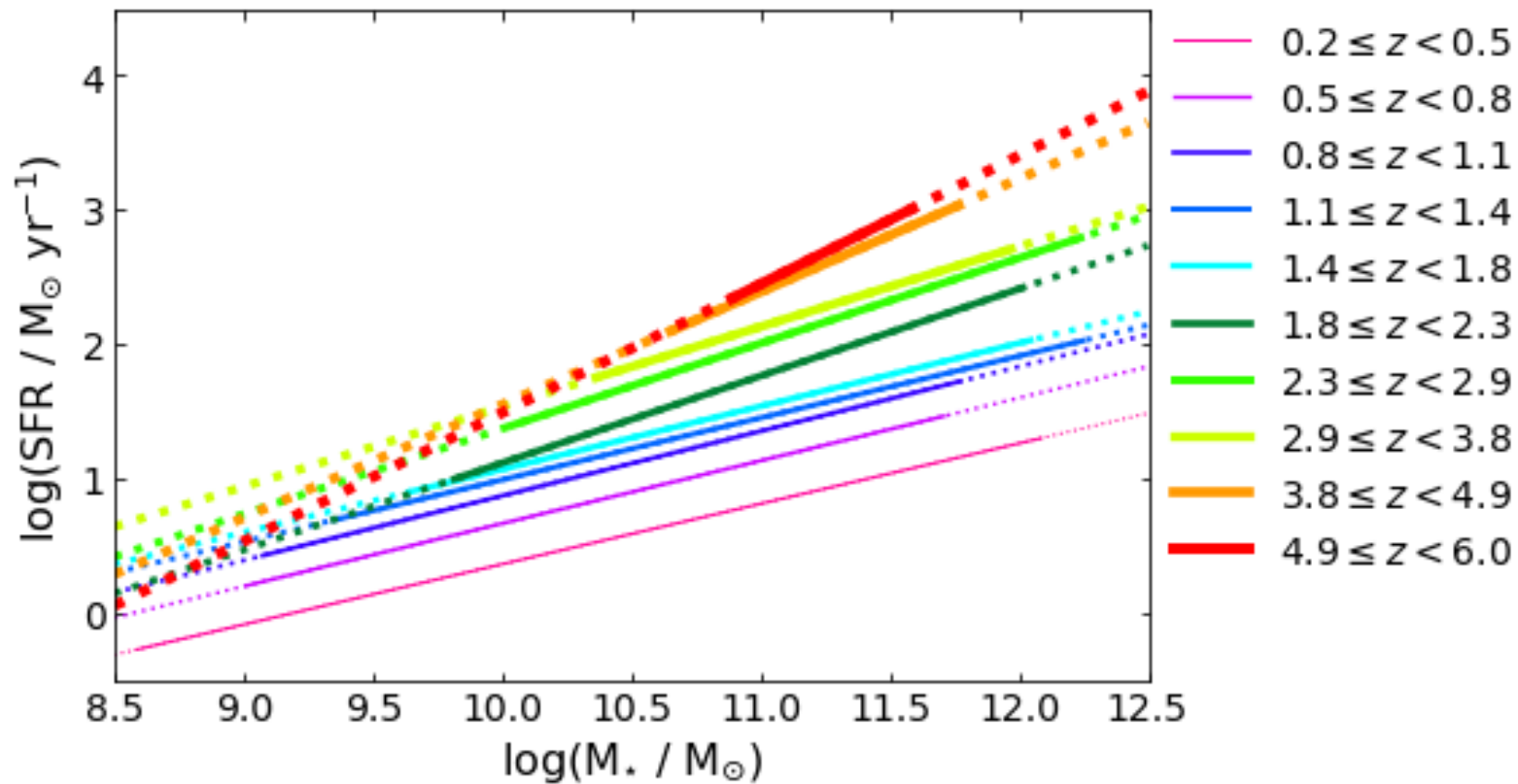


UVJ colour cut

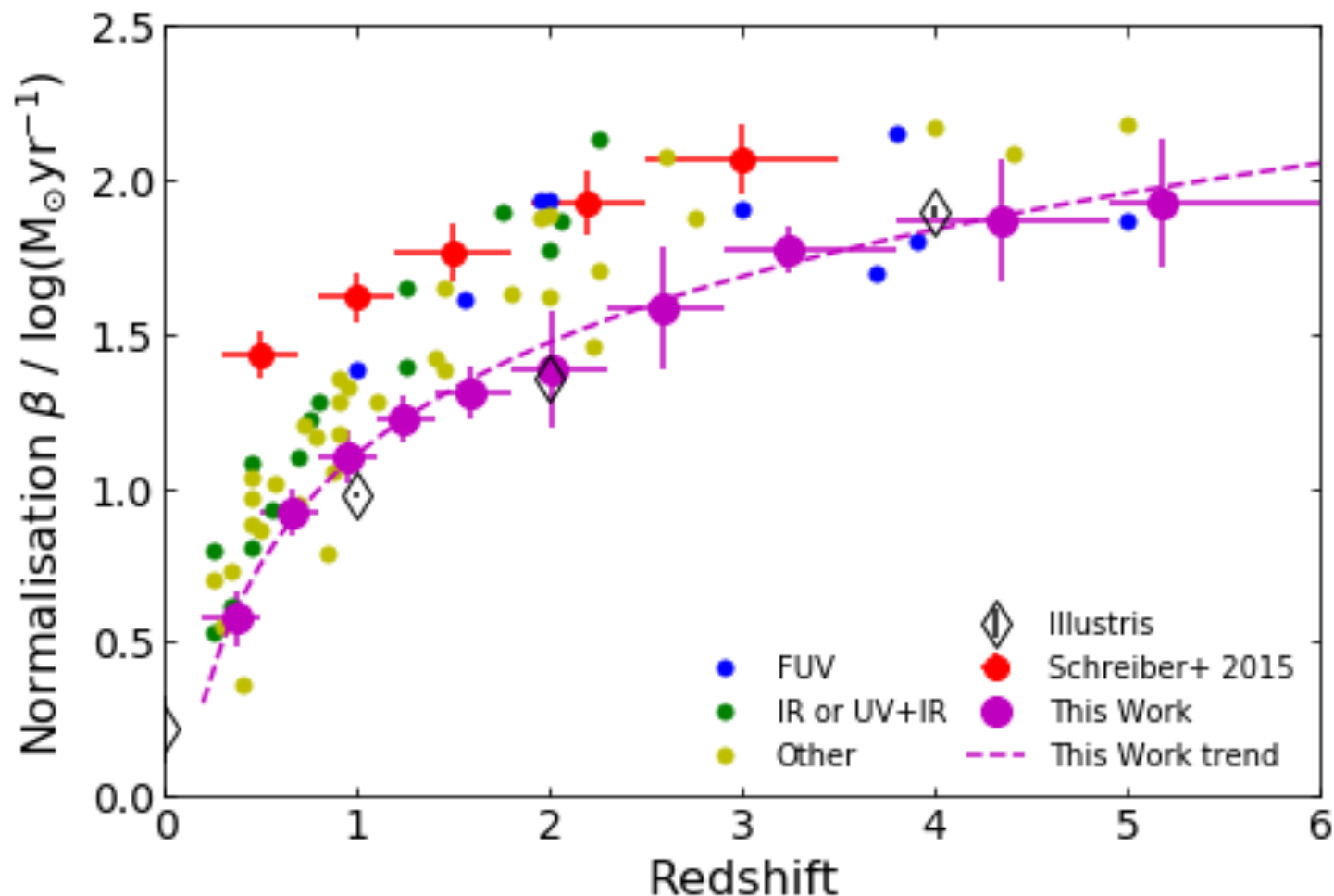
How do we find the MS?



Main Sequence Evolution

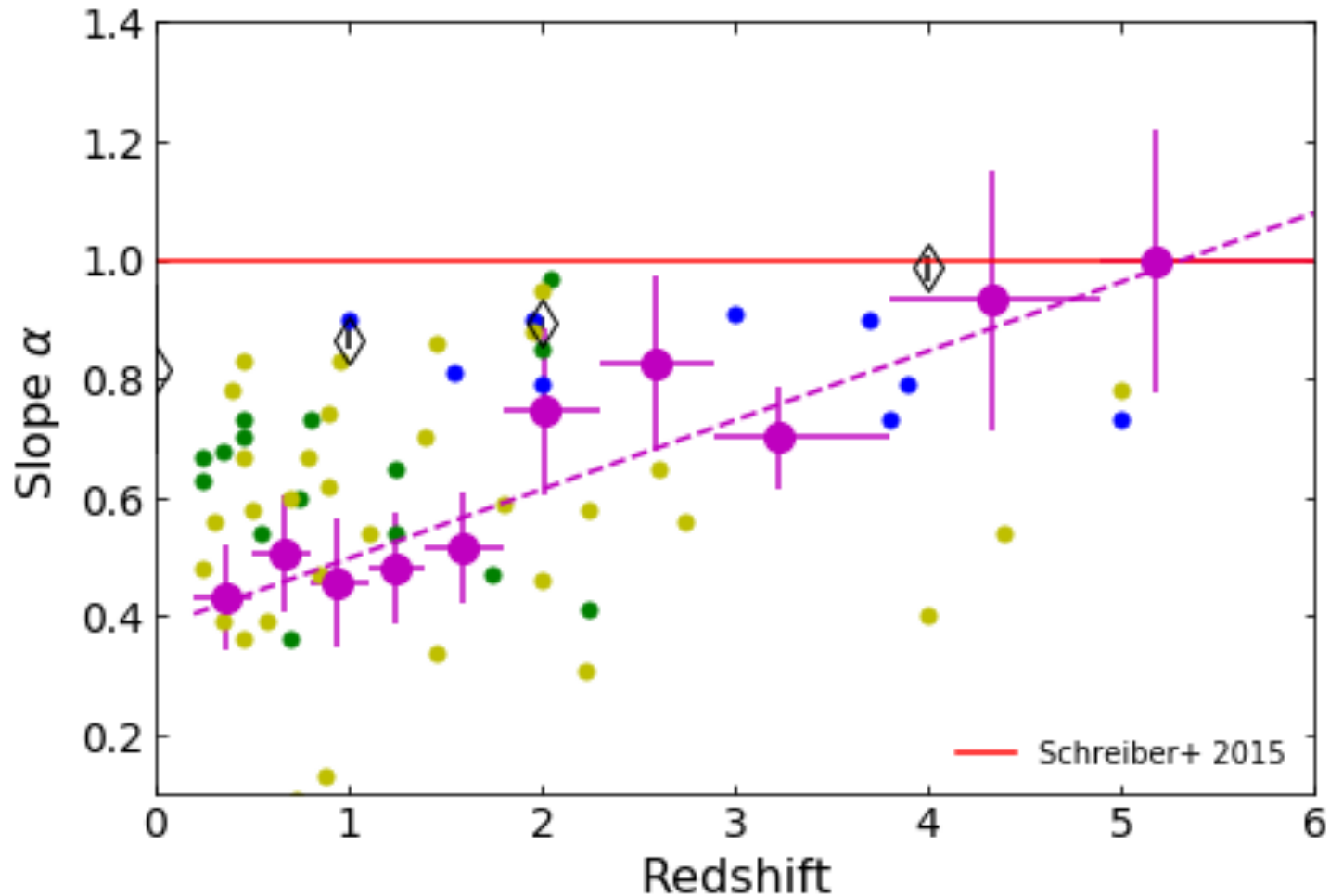


Main Sequence Evolution: Normalisation at $\log(M_*) = 10.5$



$$\beta(z) = 1.10 + (0.53 \ln(0.03+z))$$

Main Sequence Evolution: Slope



$$\alpha(z) = 0.38 + 0.12z$$

Summary

- Made a pipeline to de-blend SPIRE data
- Proven to work when comparing with ALMA
- Derived M^* and SFR using SED modelling
- Populated the SFR- M^* plane over $0.2 < z < 6.0$
- Found the MS over this z range
- Normalisation and slope increases with redshift