The nature of the brightest sub-mm galaxies in the UDS field

A NOEMA antenna by night and day
(Image credit: IRAM)

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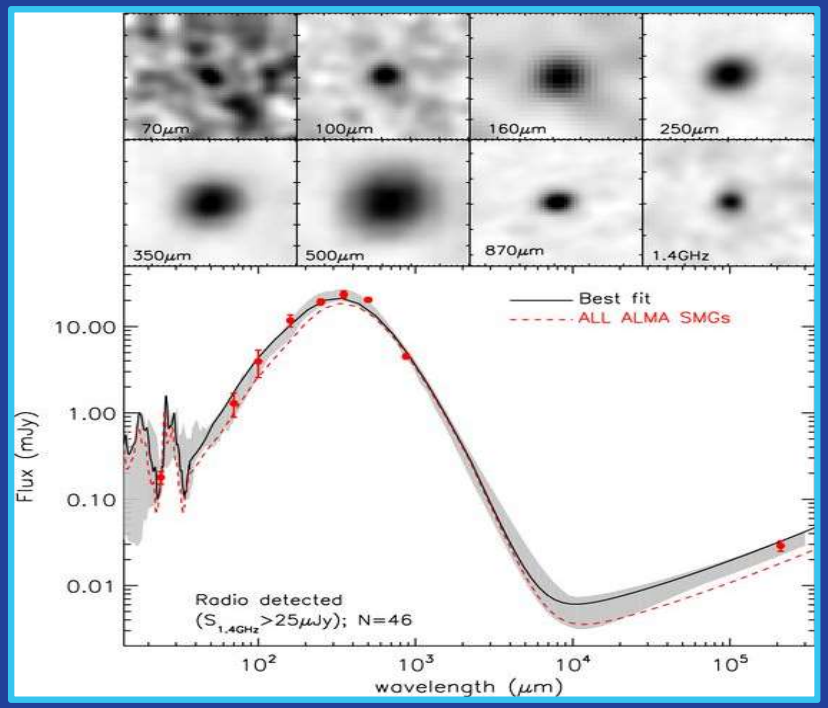
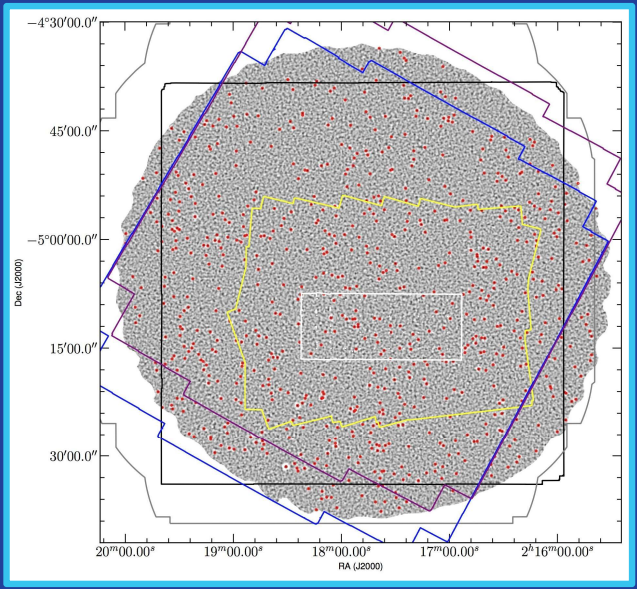
Submillimetre galaxies - background

- Typical star formation rates ~10^{2-3} M_o/year
- High-redshift, dust obscured → light re-processed into far-IR → observed at mm/sub-mm wavelengths
- Important tools for studying star formation and galaxy evolution
- Suggested to evolve into local elliptical and spheroidal galaxies
- **How do the brightest of these objects differ from the general population?**



An SMG SED (Swinbank et al. 2014)

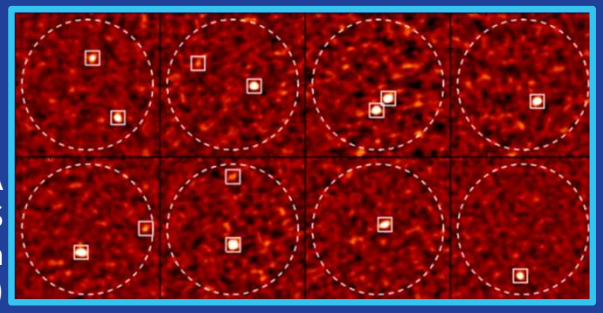
NOEMA and the AS2UDS survey



Coverage of the AS2UDS sample (Stach et al. 2019 in prep)

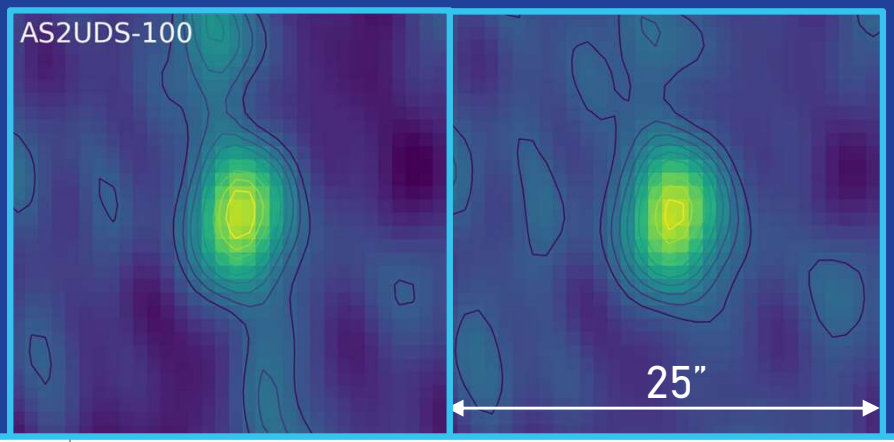
The NOEMA interferometer (Image credit: IRAM)

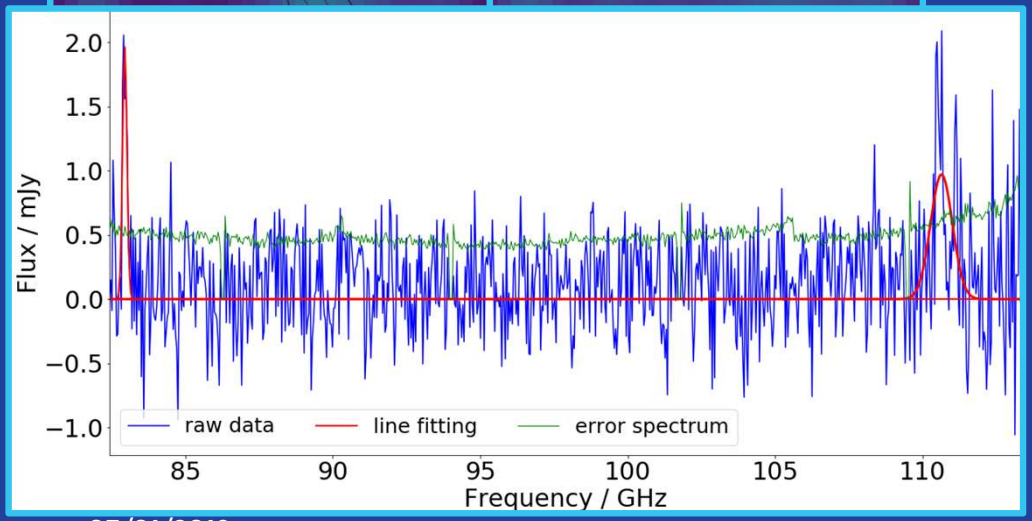
- 716 ALMA-observed sub-mm sources in the UKIDSS Ultra Deep Survey field (708 catalogued at >4.3σ)
- NOEMA - 10 x 15m radio antennae, 2550m altitude
- Lower resolution than ALMA but greater bandwidth (32 GHz) – good for CO line searches
- 10 brightest sources have fluxes of 10-13mJy at 870 microns

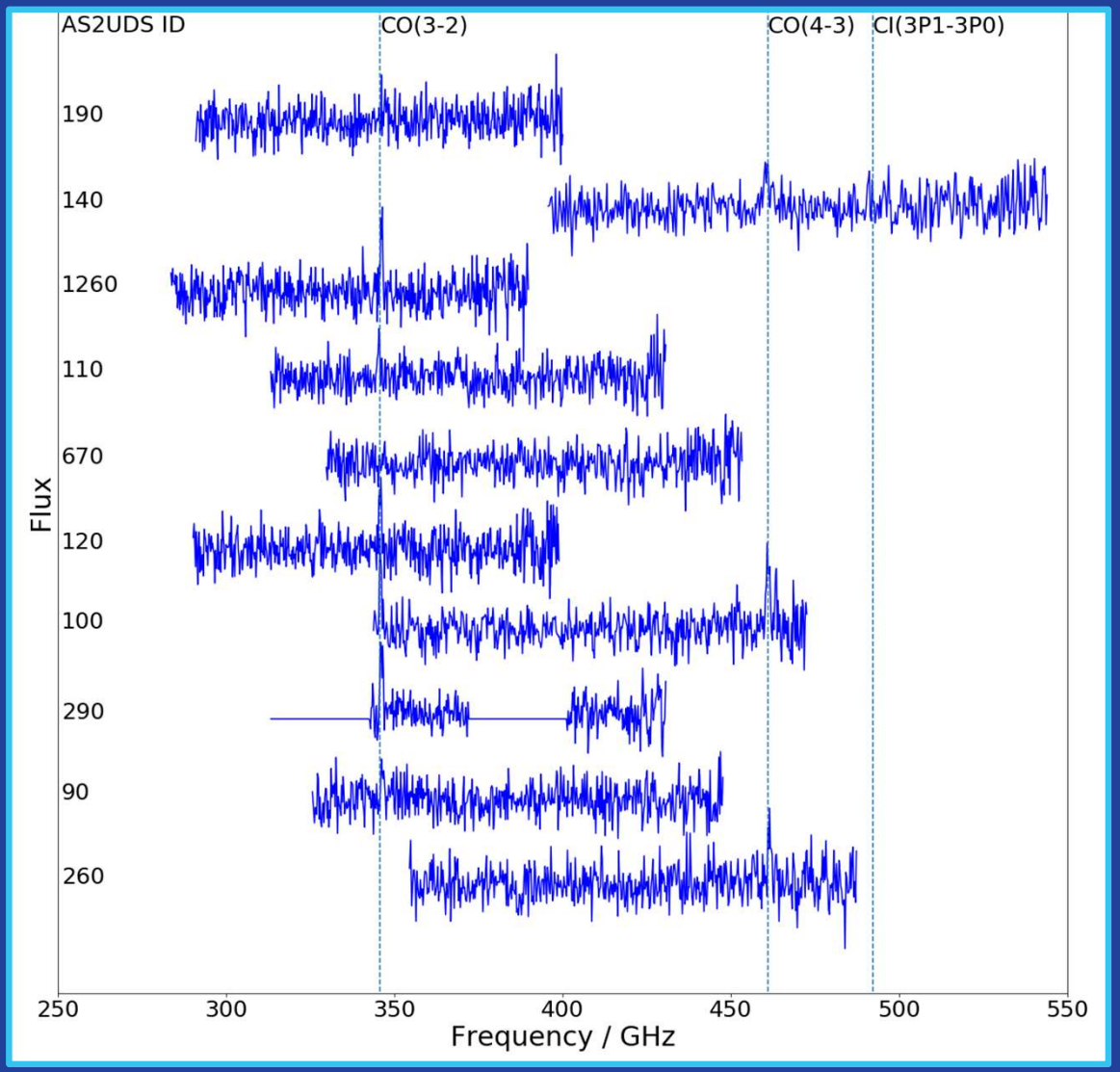


Some of the ALMA maps of the UDS SMGs (Simpson et al. 2015)

Early results

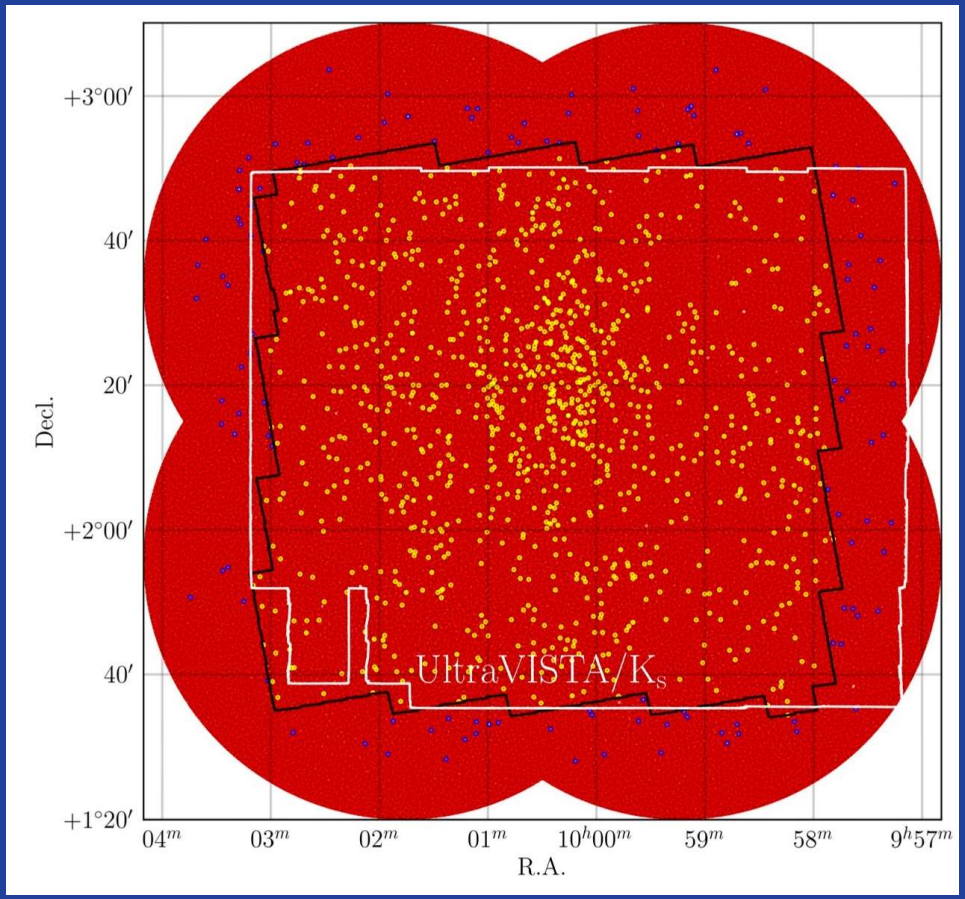






Conclusions and future work

- Detected CO emission lines in ≥7 out of 10 sources
- Want to establish redshift distribution, gas/dynamical masses of our sample
- Blind line searches for potential companion sources
- Similar follow up on COSMOS field (~12-16 mJy)



Coverage of the COSMOS field by SCUBA-2 (Simpson et al. 2019 in prep)