

Extragalactic Science Splinter Group Summary

In our 1.5 hour session, we discussed the many science needs brought up in the extragalactic science session during day 1, but did not try to cull one or two top science priorities. The conclusion that we came to, based on the realities of the state of technology, programmatics, and science was that the science-needs warrant two FIR observatories with different time horizons: [a single aperture observatory](#) and a [spatio-spectral interferometer](#).

Examples of [key science drivers](#) and their [very different spatial resolution](#) requirements:

High sub-arcsecond resolution and high sensitivity:

- To resolve clumps of high- z , H_2 and low metallicity dust emission which peaks at shorter wavelengths than for solar metallicity
- To resolve structure involved in massive molecular outflows in local merger systems, FIR P-Cygni and absorption line profiles of OH and H_2O are key

High sensitivity with low spatial resolution:

- Large scale structure, galaxy evolution, star formation: spectroscopic surveys covering large areas to beat resolution set by confusion, cross correlation with other surveys
- To calibrate/anchor the distribution of H_2O and carbon over cosmic time
- Large scale Sunyaev-Zel'dovich surveys to get the masses of clusters / extended emission