

Dust Emission as a Probe to Galaxy Evolution in the Distant Universe

Wei-Hao Wang (Academia Sinica), Amy J. Barger (University of Wisconsin-Madison), Lennox L. Cowie (University of Hawaii), Chian-Chou Chen (University of Hawaii), Hsiao-Wen Chen (University of Chicago)

Thermal emission from dust is a unique tracer of galaxy formation and evolution in the distant universe. Unlike observations in the optical wavebands, observing dust emission in the submillimeter is not affected by extinction and thus can better trace the bolometric luminosity from star formation in galaxies. Furthermore, the Rayleigh-Jeans portion of the dust emission has a spectral slope that can nearly cancel the effect of luminosity distance, making the observed flux of distant galaxies almost invariant across a broad range of redshift, from $z \sim 1$ to up to $z \sim 10$. In this talk, I will introduce our recent studies of distant galaxies conducted in the submillimeter waveband, which take the above advantage of dust emission. In particular, I will present our JCMT SCUBA-2 survey of distant galaxies and our SMA followup. I will also briefly mention an ALMA pilot study on the dust emission from distant gamma-ray burst host galaxies.