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Herschel HerMES consortium ()
Herschel-ATLAS consortium ()

Presentation Requested: oral
Category: Assembly of Galaxies / Mass & Structure Evolution
Question: What have we learned or can we learn about galaxies at the Epoch of Reionization with ALMA / what are the synergies with other telescopes? What is the role of ALMA, JVLA and SKA (and other telescopes) for confirming galaxies where Lyman alpha is not detected (i.e. at putative z > 7.5)

The most luminous, dusty star-forming galaxies at high redshift discovered by Herschel

Optical and near-infrared deep surveys are now finding galaxies at very high redshifts. However, they are typically small, not massive and present star formation rates up to several hundred solar masses per year (e.g. Finkelstein et al. 2013, Nature, 502, 524). The Herschel Multi-tiered Extragalactic Survey (HerMES, Oliver et al. 2012, MNRAS, 424, 1614), the largest project that has being carried out with the Herschel Space Observatory, has discovered a massive, maximum-starburst galaxy at a redshift of 6.34 (Riechers et al. 2013, Nature, 496, 329) and even more extreme sources at redshifts larger than 4 (Dowell et al. 2014, ApJ, 780, 75). A large number of similar high-redshift candidates have also been found in the Herschel ATLAS survey (Eales et al. 2010, PASP, 122, 499), the largest key project awarded on Herschel as an Open Time survey. The presence of such galaxies in the early Universe challenges current theories of galaxy fomation and evolution. We will describe the method we have developed to find these galaxies, the follow-up observations with different facilities and the main physical properties of these extreme young galaxies. Three ALMA cycle 2 projects (PIs Conley, Ivison, and Riechers) have been recently selected to measure the redshifts and the line and continuum properties of a sample of southern hemisphere, high redshift candidates selected from the SPIRE data of these two Herschel surveys.