X09b   ALMA lensing cluster survey (ALCS): Overview and initial results

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Recent ALMA observations have unveiled the presence of faint (i.e., sub-mJy at $\lambda \sim 1$ mm, significantly fainter than the classical bright submillimeter galaxies), dusty star-forming galaxies, which are often invisible in the deepest near-infrared images taken with the *HST* and 8-m-class telescopes. They seem to represent the bulk population of massive galaxies at $z > 3 - 4$ and beyond, which have been completely missed by the LBG selection using *HST*/WFC3. Due to its faintness, however, detailed physical characterization of the faint dusty star-forming population remains a challenge. Here we present an overview of the ALMA lensing cluster survey (ACLS), one of the cycle-6 large programs of ALMA. It aims at obtaining high-resolution ($\sim$arcsec) 1.2-mm images of high-magnification regions of 33 lensing clusters with a depth of 60 μJy (1σ). The sample is taken from the best-studied massive clusters including CLASH, HFF, and RELICS. We have detected 137 continuum sources above 5σ, and we find a significant number of near-infrared-dark, magnified (but intrinsically faint) dusty star-forming galaxies. Initial outcomes, including the discovery of a galaxy group at $z = 4.32$ lensed by the massive galaxy cluster ACT-CL J0102-4915 (aka *El Gordo*) at $z = 0.87$, associated with a near-infrared-drop ALCS source (Caputi, Caminha, Fujimoto, Kohno et al. 2021, ApJ, 908, 146), will be reported.