

Status report of Atacama Large Millimeter/submillimeter Array (ALMA) project

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<http://www.nro.nao.ac.jp/alma/J/index.html>

Several large millimeter/submillimeter array projects were conceptualized in the 1980s (i.e., MMA, LMA/ LMSA and LSA) as next generation instruments to achieve higher sensitivity and spatial resolution. Such arrays were planned to observe emission from cool atomic gas, molecular gas and dust in the universe, from which stars, planets, and galaxies are formed. In addition, specific quantitative studies, such as, estimation of kinetic energy, and gas mass and density distribution law in protoplanetary disks and molecular envelopes around newly born stars, are important goals for such arrays.

With an aim to realize an ultimate synthesis telescope at millimeter/submillimeter wavelengths, the Atacama Large Millimeter/submillimeter Array (ALMA) is being built by a collaboration between Europe, North America, and Japan, located on the Chajnantor Altiplano in the Atacama Desert of northern Chile. The Japanese funding started in 2004. The ALMA will be completed as a construction in 2012, and will be operated by trilateral partnership.

To enhance scientific quality of ALMA, the Atacama Compact Array (ACA) and millimeter/submillimeter receivers will be built by ALMA Japan (ALMA-J). The ACA is a millimeter/submillimeter short-spacing imaging system consisting of four 12-m antennas for Total Power observation (TP array) and twelve 7-m antennas for interferometry (7-m array).

In this report, we present the progress status of ALMA, mainly on the ALMA-J's activities: the ACA 12-m antenna, ACA Correlator, submillimeter receivers, a millimeter receiver, and other facilities for site infrastructure that ALMA-J cooperatively contributes to with Europe and North America.