

# The ALMA at Chajnantor

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The international Atacama Large Millimeter Array will be constructed on the high (5050 m) plateau southwest of Cerro Chajnantor, Chile, about 40 km east of the village of San Pedro de Atacama. Measurements since 1995 have demonstrated this is a premier site for observations at millimeter and submillimeter wavelengths, with exceptional atmospheric conditions, i. e., transparency and stability.

The ALMA will consist of sixty four antennas, each 12 m diameter. These antennas are transportable so the array can be reconfigured to provide a variety of observational capabilities. Instead of discrete configurations, the ALMA will use a flexible reconfiguration scheme. By moving a few antennas, the array size can be increased or decreased slightly in a self-similar manner. In operation, the array will be reconfigured continuously, cycling from the smallest to the largest configuration and back with a schedule adjusted to meet scientific demand. In total, the ALMA configurations will have more than 225 antenna stations and span a 100:1 dynamic range from 150 m to 14 km effective diameter. The most compact configuration is designed for maximum surface brightness sensitivity, the intermediate configurations, about 250 m to 4 km diameter, are designed for high quality imaging with Gaussian synthesized beam shapes to minimize sidelobes and reconstruction errors, and the largest configuration is designed for maximum resolution.

Only the actual components of the ALMA telescope, i. e., the antennas, the receivers, the associated electronics, and the necessary infrastructure will be installed at the high altitude site. As far as possible, the array will be operated and maintained from a lower altitude (2900 m) Operations Support Facility about 25 km from from the telescope. Every effort will be made to minimize the number of people working at high altitude. The OSF will have shops, labs, offices, and residence facilities. During construction, the antennas will be assembled and outfitted at the OSF then transported along a private road to the array site for integration into the growing array. During operations, an antenna will be transported back to the OSF if it requires major maintenance.

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