

The Large Millimeter Telescope (LMT)

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The LMT is a 50 m diameter telescope for operation in the wavelength range of 1 to 4 mm from a high mountain site in central Mexico. The telescope is designed to address fundamental questions about the origin and formation of galaxies, clusters of galaxies as well as stars and planets. It is a joint project of the Mexican Instituto Nacional de Astrofisica, Optica y Electronica (INAOE) in Tonantzintla, Puebla and the University of Massachusetts at Amherst, MA, USA. The telescope is in the Detailed Design phase and completion of the installation at the site is scheduled for the middle of 2001. The Design Contractor is MAN Technologie of Gustavsburg, Germany.

The alt-azimuth telescope employs a paraboloidal reflector, composed of 5 rings of panel units, the positions of which can be actively controlled by actuators and a real-time measuring system. The reflector specification under operational conditions is 75 micrometer. The pointing will use a laser based active control system to achieve the specified pointing and tracking accuracy of 0.6". The subreflector of 2.6 m diameter will be capable of beam chopping and will also be adjusted in position for fast pointing corrections. The telescope has a large Nasmyth receiver room, directly behind the main reflector, which is stationary in elevation, but moves with the telescope in the azimuth coordinate. The flexibility of this room will be exploited to create an observing environment in which easy and remotely controlled change of receivers will enable us to apply queue observing scheduling, thereby taking full advantage of the best observing conditions and providing the largest number of scientific programs with guaranteed good data.

The LMT will have powerful initial facility instrumentation. A 32-pixel array of MMIC amplifiers will cover the 85-115 GHz band with an instantaneous bandwidth of 15 GHz, followed by a large digital correlator. The first half of this system is presently in use at the FCRAO 14 m telescope in Massachusetts. At 1.2 mm there will be a 144-pixel Bolometer array for high sensitivity continuum mapping. A partial version of this system will be used on the CSO in Hawaii this winter. These Systems are being developed at the University of Massachusetts. An SJS-receiver for the 1.3 mm band will be built at INAOE, as well as the equipment for the holographic measurement of the primary surface.

The site for the LMT is Cerro la Negra, a 4680 m high extinct volcano in central Mexico, less than two hours drive from the offices of INAOE. Weather monitoring and opacity measurements with a 230 GHz radiometer indicate excellent conditions for millimeter wavelength observations during most of the year. The latitude of 19 degrees is favourable for viewing the Southern sky.

In the presentation we will summarize the basic technical features of the telescope design and present a review of the current status and the planning of the project.