

## ALMA's First Antenna Arrives at Operations Support Facility (OSF)

On April 20th, the pedestal assembly of the first ALMA VertexRSI production Antenna successfully left Antofagasta port, crossing the City escorted by the local Police on its way to OSF to join the other elements of the telescope, including the backup structure and the invar cone that joins them. On 2007 April 27 at 3:15pm the crane hangers were removed and the first Vertex RSI antenna pedestal assembly was pointed skyward, bolted to its foundation outside of the Vertex hangar at the OSF. That evening, the first Southern Hemisphere (proto)starlight fell upon an ALMA production antenna. The second VertexRSI antenna is poised to follow as its pedestal is assembled in Kilgore, Texas prior to shipping. The second antenna will be erected inside the VertexRSI site erection facility recently finished at the OSF.



**Figure 1** The first ALMA production antenna reached the OSF and assembly was begun. Here the VertexRSI pedestal stands on its pad to the right of the partially assembled backup structure in front of the site erection facility at the OSF.

Three Mitsubishi antennas are scheduled to arrive in Antafagasta from Osaka, Japan, within the next few weeks. Their assembly will then begin at the Mitsubishi laydown area at the OSF.



**Figure 2 The access platforms were being installed on the VertexRSI antenna at press time.**

The third type of antenna, from the AEM consortium, will be delivered to the OSF next year. It will be assembled in a third area near the OSF, the AEM laydown area. Work on construction of this facility has begun. The work should be completed by the end of June.



**Figure 3** During the celebration of the completion of a roof on the OSF warehouse, members of the local community joined ALMA and others as a pachamama or 'payment to the Earth' ceremony was held, in which harmony is sought. Photo: R. Simon

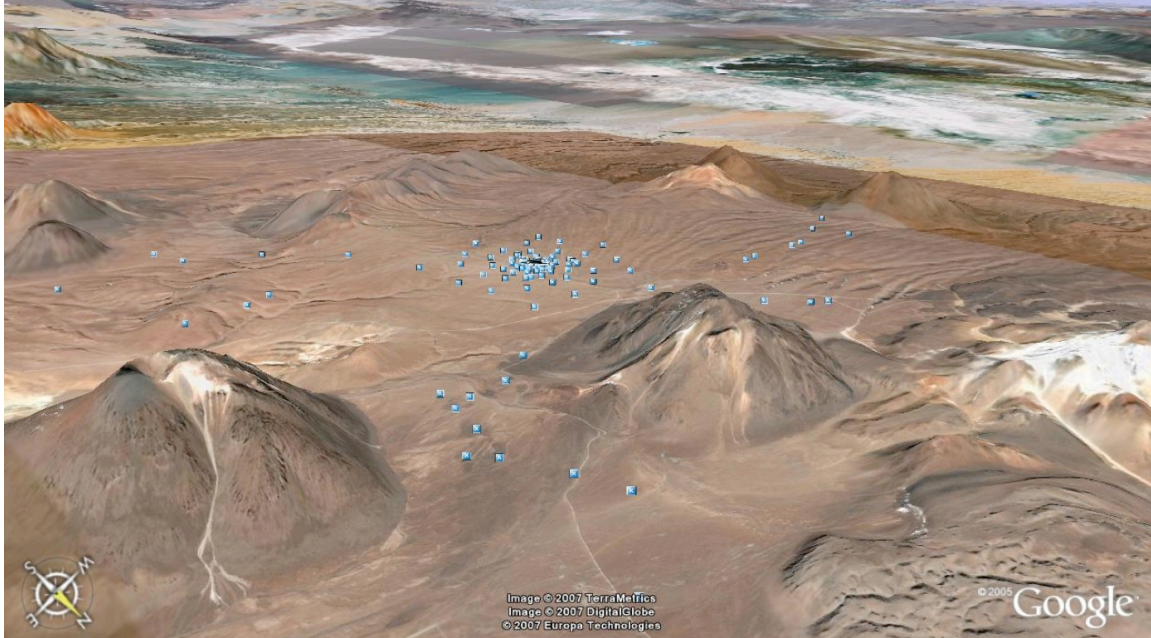
On 2007 March 10 a ceremony was held at the Operations Support Facility (OSF) to celebrate the completion of the roof structure on the OSF technical facility building. Held in the nascent OSF warehouse, the crowd of workers and others heard speeches from, among others, the Mayor of San Pedro de Atacama, Sandra Berna. The facility, which will host about 100 people during operations, consists of three main buildings: the technical building, hosting the control center of the observatory, the antenna assembly building, including four antenna foundations for testing and maintenance purposes, and the warehouse building, including mechanical workshops. The warehouse should be available later this year with the whole building slated for completion by January 2008.



**Figure 4 The Technical Building at the Array Operations Site will be dedicated as part of the NRAO 50th anniversary celebration.**

At the 16400 elevation Array Operations Site, the Technical Building construction has finished. The building now has temporary power and internet connections and is being readied to receive the first quadrant of the ALMA correlator later this year. The dedication of the building will be a featured event of the NRAO 50<sup>th</sup> Anniversary Celebration on 14 June. The ceremony will be carried to NRAO sites via video.

The design of the antenna configuration and of the road and fiber network interconnecting the antenna foundations has been completed, and bids received to construct this critical infrastructure.

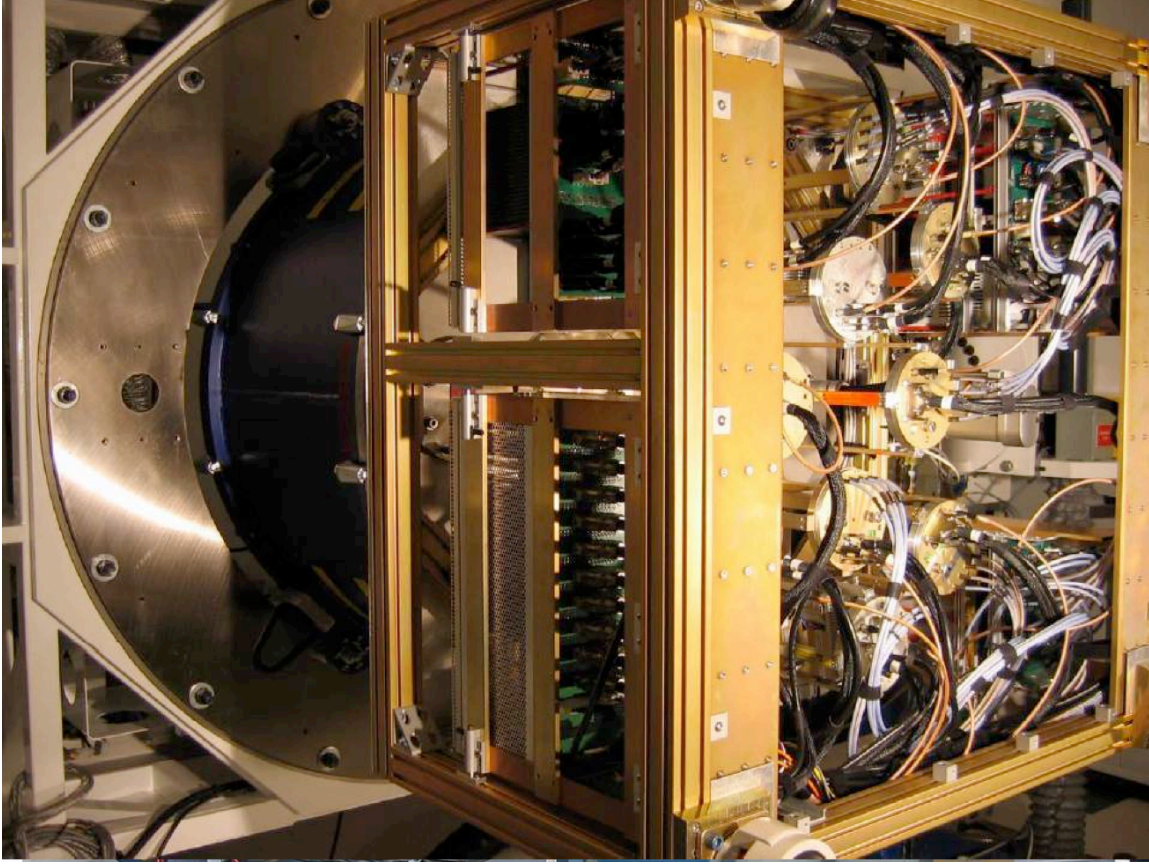


**Figure 5** From the central cluster near the Technical Building, the ALMA array configuration stretches across the Array Operations Site, providing mean baselines of 14km in its largest extent.

In Santiago, the growth of staff has exceeded the capacity of the JAO headquarters in Las Condes. Plans are proceeding for construction of the permanent headquarters next to ESO in Vitacura. As the new building is not expected to be completed soon temporary space has been secured at the University of Chile Department of Astronomy quarters at Cerro Calan.

The ALMA Board held the first of its 2007 meetings in Tokyo at the National Center of Sciences of Japan. Dr. Yoshiro Shimura, President of the National Institute of Natural Sciences, welcomed the Board members to Tokyo with remarks on the bright future of ALMA. The Master Agreements for ALMA Goods and Services between North American partners and ESO, and the National Astronomical Observatories of Japan were signed in March and May, providing the detailed framework for construction of ALMA.

At the ALMA Test Facility (ATF) on the Very Large Array Site, equipment needed to test and verify performance of the ALMA production antennas has been proven. A holography system and an optical pointing telescope, items critical for the preparation of the antennas, were accepted and shipped to the Operations Support Facility. During the coming months, the ATF will concentrate on radio pointing, installation of preproduction electronics and the two station correlator. By late summer, interferometry will be a focus of efforts there.



**Figure 6 The ALMA Front End package, incorporating the dewar, receiver cartridges and oscillators is now under test at the NTC. In this view, the panels are removed. This package will be installed on the first antenna at the OSF in Fall 2007.**

The two station correlator was built at the NRAO Technology Center (NTC) to replace the prototype correlator which has been in New Mexico for several years with a current design. At the Front End Integration Center at the NTC the first ALMA Front End (receiver package and associated electronics) has undergone beam shape measurements for the first four ALMA frequency bands.

The Science group developed a new version (v2.0) of the Design Reference Science Plan. The goal of the ALMA Design Reference Science Plan (DRSP) is to provide a prototype suite of high-priority ALMA projects that could be carried out in 3--4 years of full ALMA operations. The DRSP serves as a quantitative reference for developing the science operations plan, for performing imaging simulations, for software design, and for other applications within the ALMA project. Since v1.1 was released, Japan has joined the project, enhancing ALMA's capabilities. DRSPv2.0 expands v1.1 to include science which takes advantage of these expanded features.

ALMA's role in the search for and study of exo-planets and planetary systems has been developed at a number of scientific conferences over the past years. In December 2006 the NSF-NASA-DOE Astronomy and Astrophysics Advisory Committee (AAAC) established an ExoPlanet Task Force (ExoPTF) as a subcommittee to advise NSF and NASA on the future of the ground-based and space-based search for and study of exo-planets, planetary systems, Earth-like planets and habitable environments around other stars. A white paper describing ALMA's role in this endeavor was submitted to the ExoPTF. The ExoPTF will recommend a 15-year strategy to detect and characterize aspects of exoplanets and planetary systems. ALMA Memo No. 475 addresses this topic.