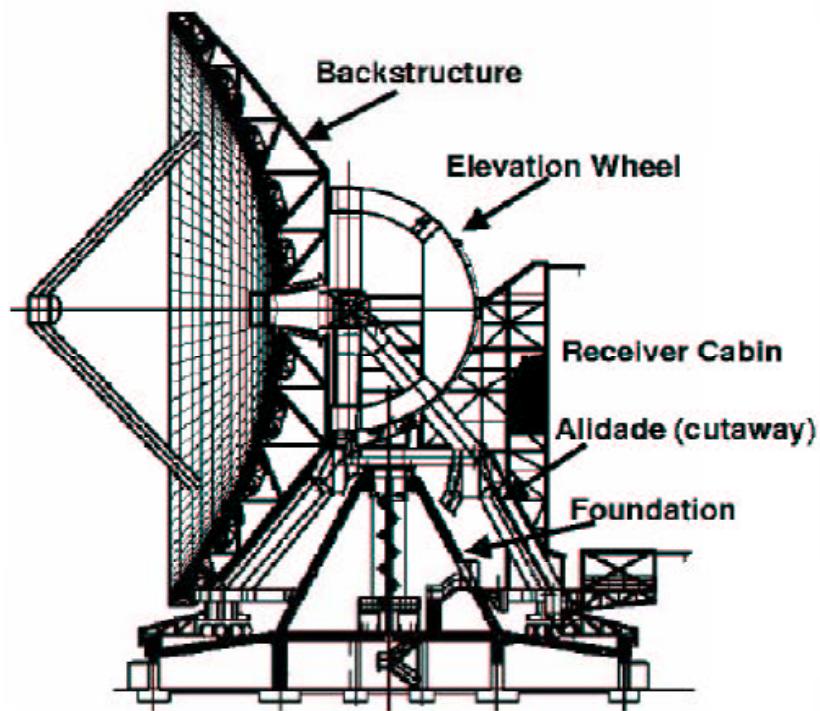


GRAN TELESCOPIO MILIMETRICO

MAYO 2009




GRAN TELESCOPIO MILIMETRICO



Parameter	Specification	
Diameter	50 m	
Surface Accuracy	75 microns (Goal: 70)	
Pointing Accuracy	1.0 arcsec (Goal: 0.6)	
Predicted Performance		
Wavelength	3.0mm	1.2mm
Aperture Eff.	0.65	0.40
Sensitivity (Jy/K)	2.2	3.5
Beam FWHM	15"	6"

Figure 2. Schematic of LMT structure and major performance metrics.



sitio GTM
Volcán Sierra Negra
(Tliltépetl) 4581m

Pico de Orizaba
(Citlaltépetl) 5800m

- excelente apoyo logístico (cerca de pueblos grandes/ciudades)
- solo 2 horas de viaje desde el INAOE con 110 km de autopista y 13 km de carretera de acceso al observatorio

Localización del Gran Telescopio Milimétrico



latitud del GTM ~ +19 degs (como Mauna Kea, Hawai)



Vista del sitio, con el camino de acceso a la derecha

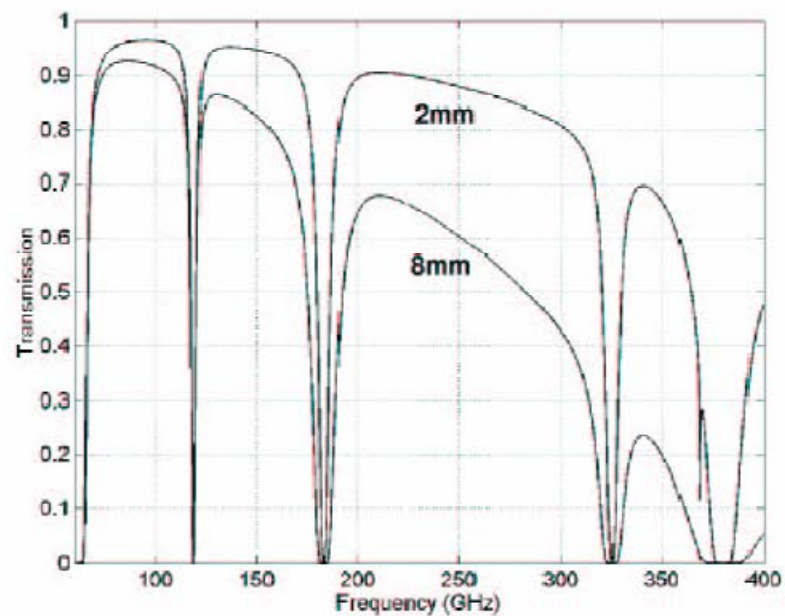
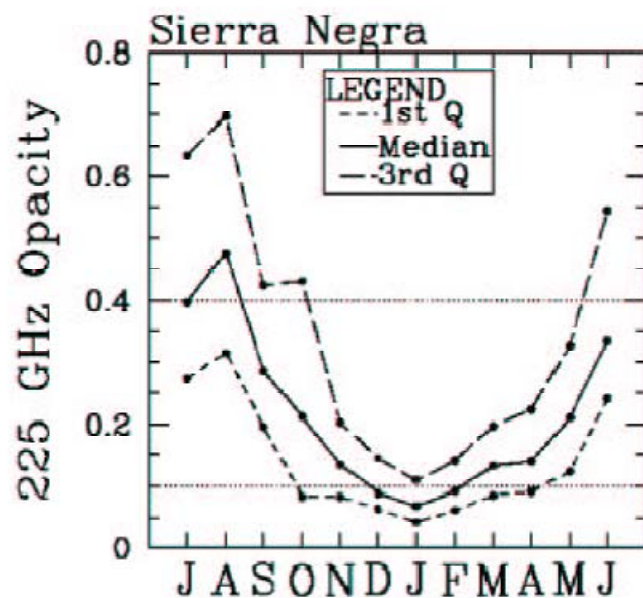


Figure 4. (left) Results of site opacity measurements at 225 GHz during 1997-2002. Median and quartile values are shown. Dotted lines show approximate levels of 2mm and 8mm of precipitable water vapor. (right) Transmission curves corresponding to 2mm and 8mm precipitable water vapor cases.



















Pista soldada por Pailería de San Luis Potosí

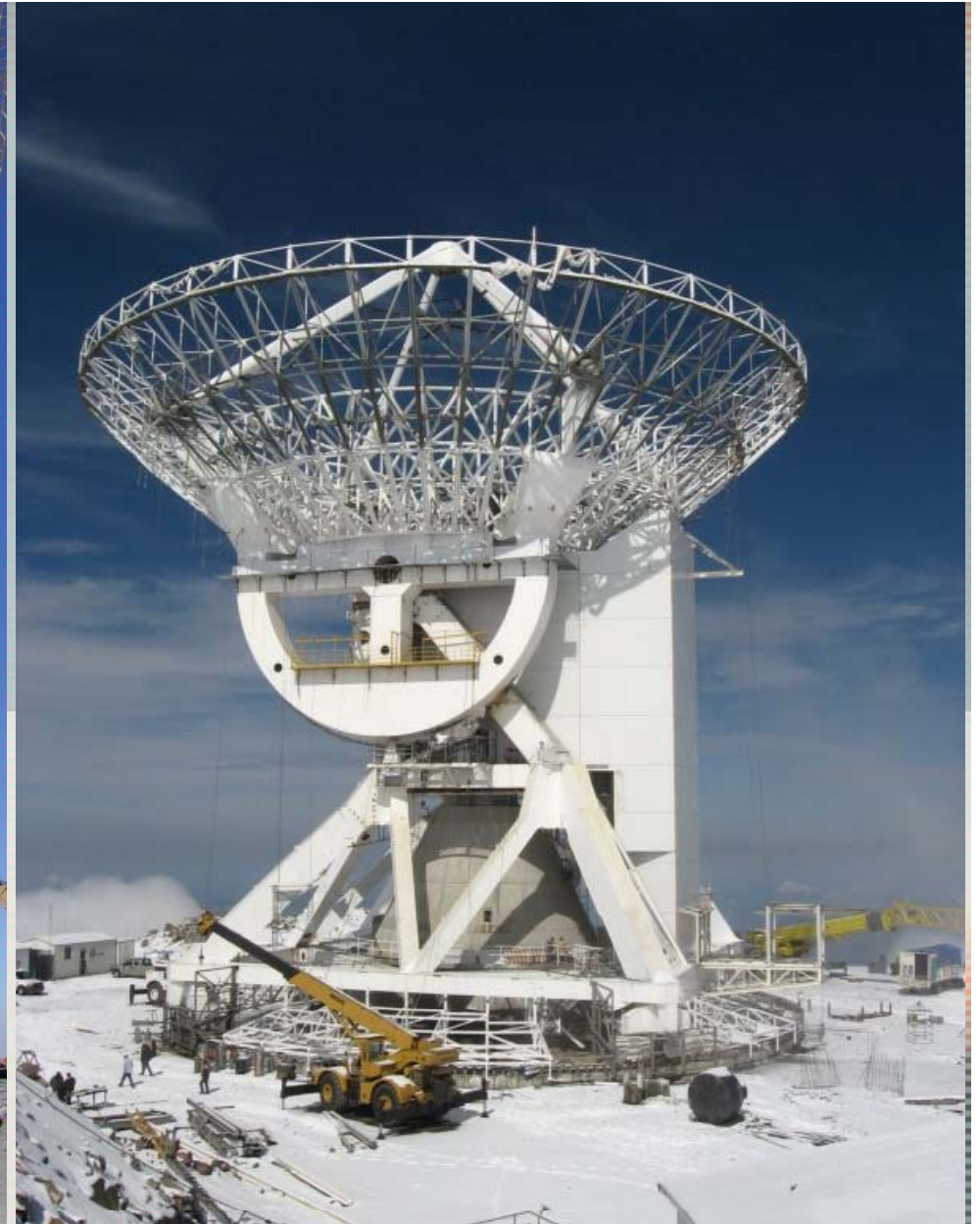


Estructura de la antena alineada en el suelo



Levantando la estructura de la antenna en Noviembre, 2005





Instalación de la cubierta protectora, que es la protección térmica, para cubrir la estructura de acero de 2,183 toneladas



Motor de elevación



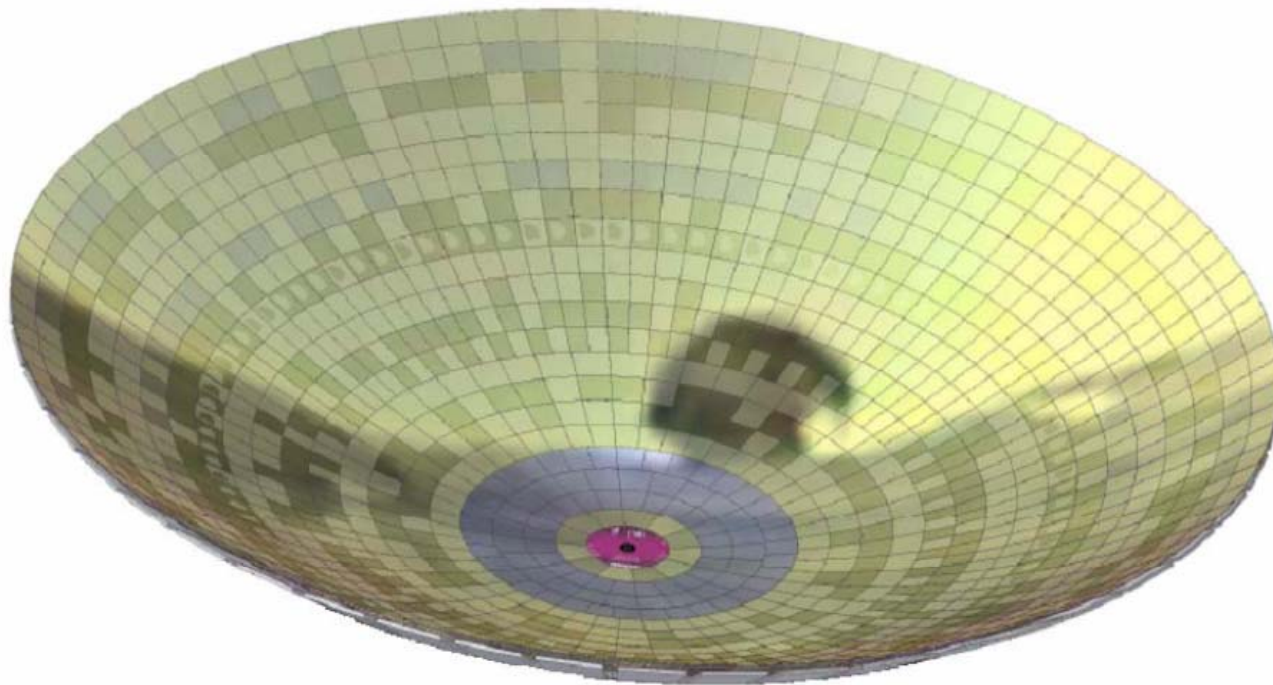
Movimiento azimutal



Sotanos dentro del cono de concreto

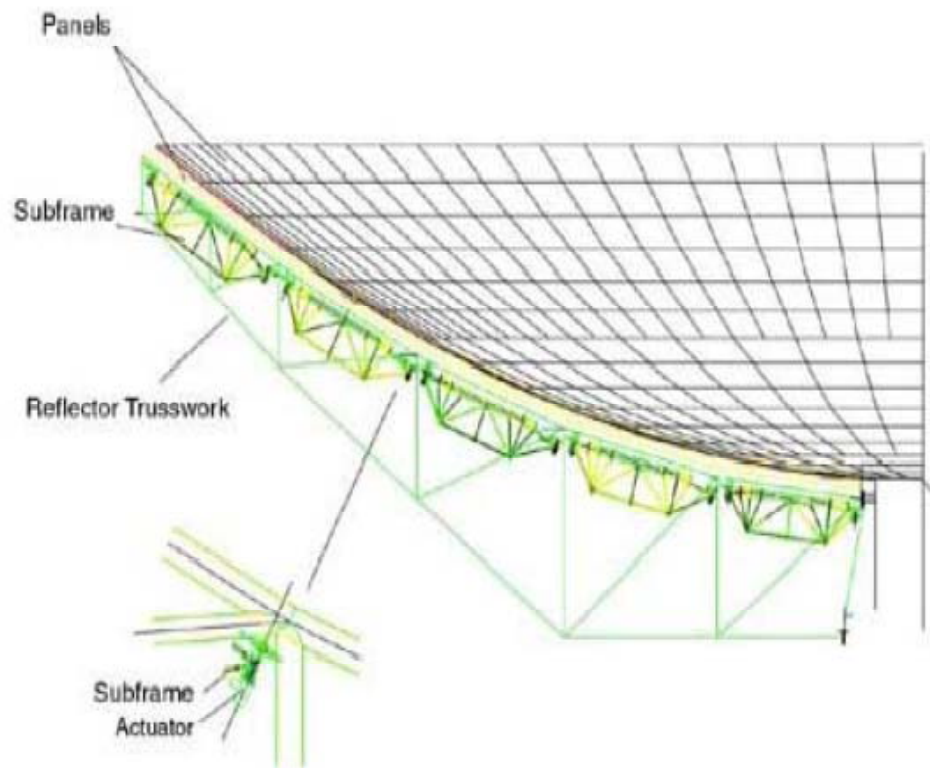
The main reflector is a 50 m diameter parabolic dish with the following parameters:

- Inner diameter 3.25 m
- Outer diameter 50 m
- Focal length 17.5 m

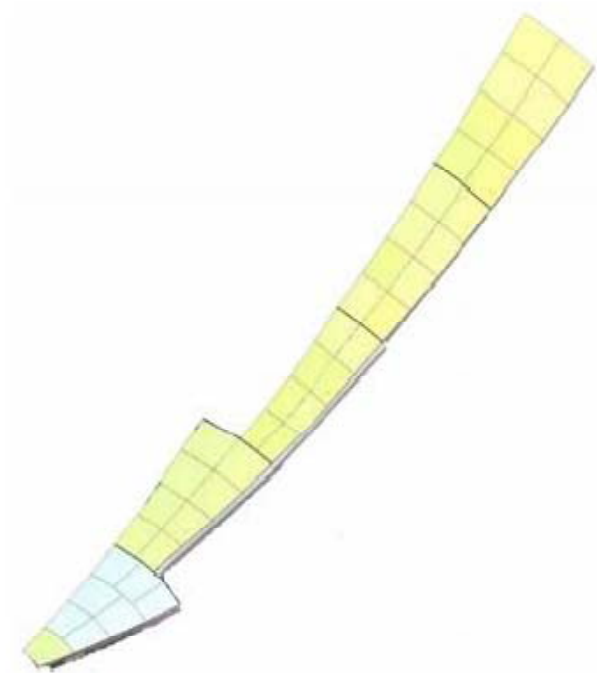


Main reflector surface

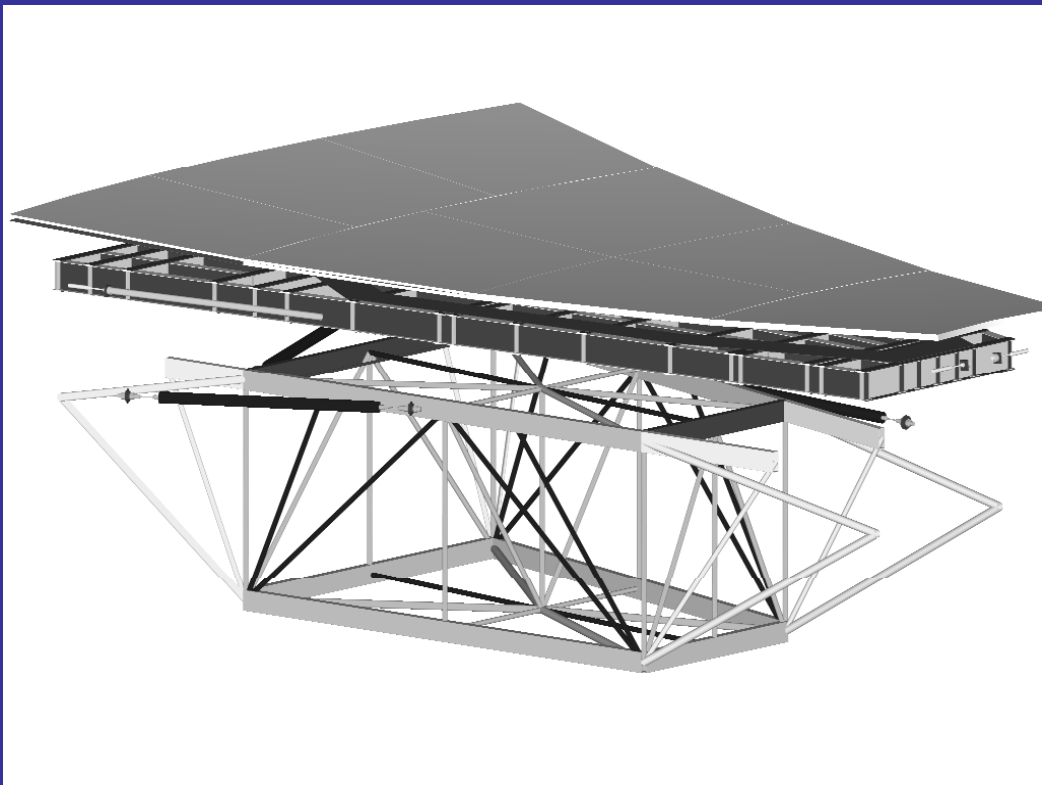
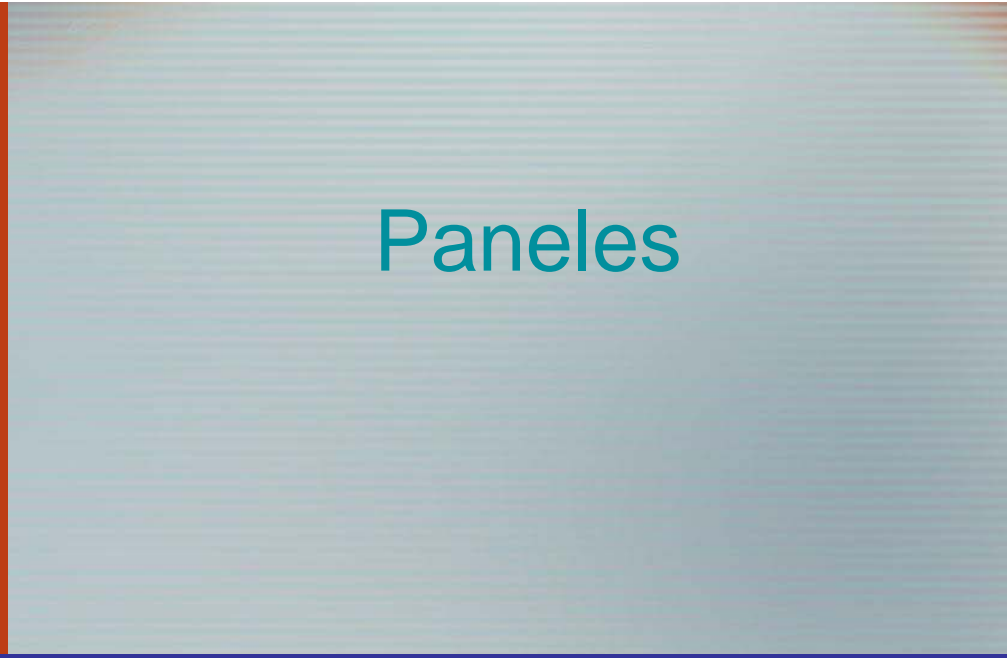
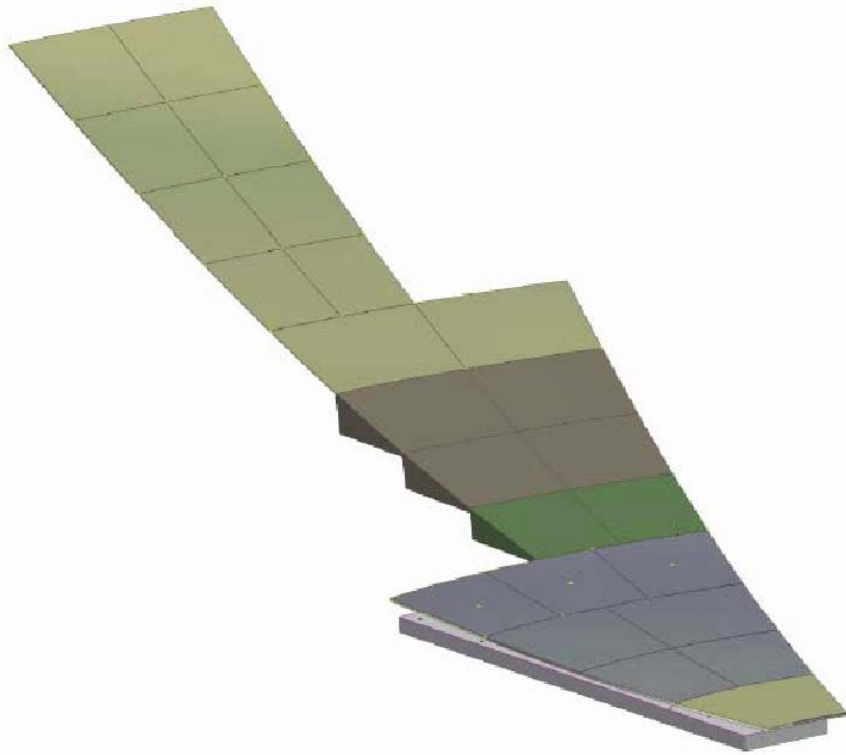
The primary reflector is subdivided in 5 rings, consisting of identical surface segments within each ring. The surface segments are composed of a sub-frame interfacing with the backup structure via a motorised alignment mechanism, a base plate and the reflector panels attached to the base plate via adjustable supports.

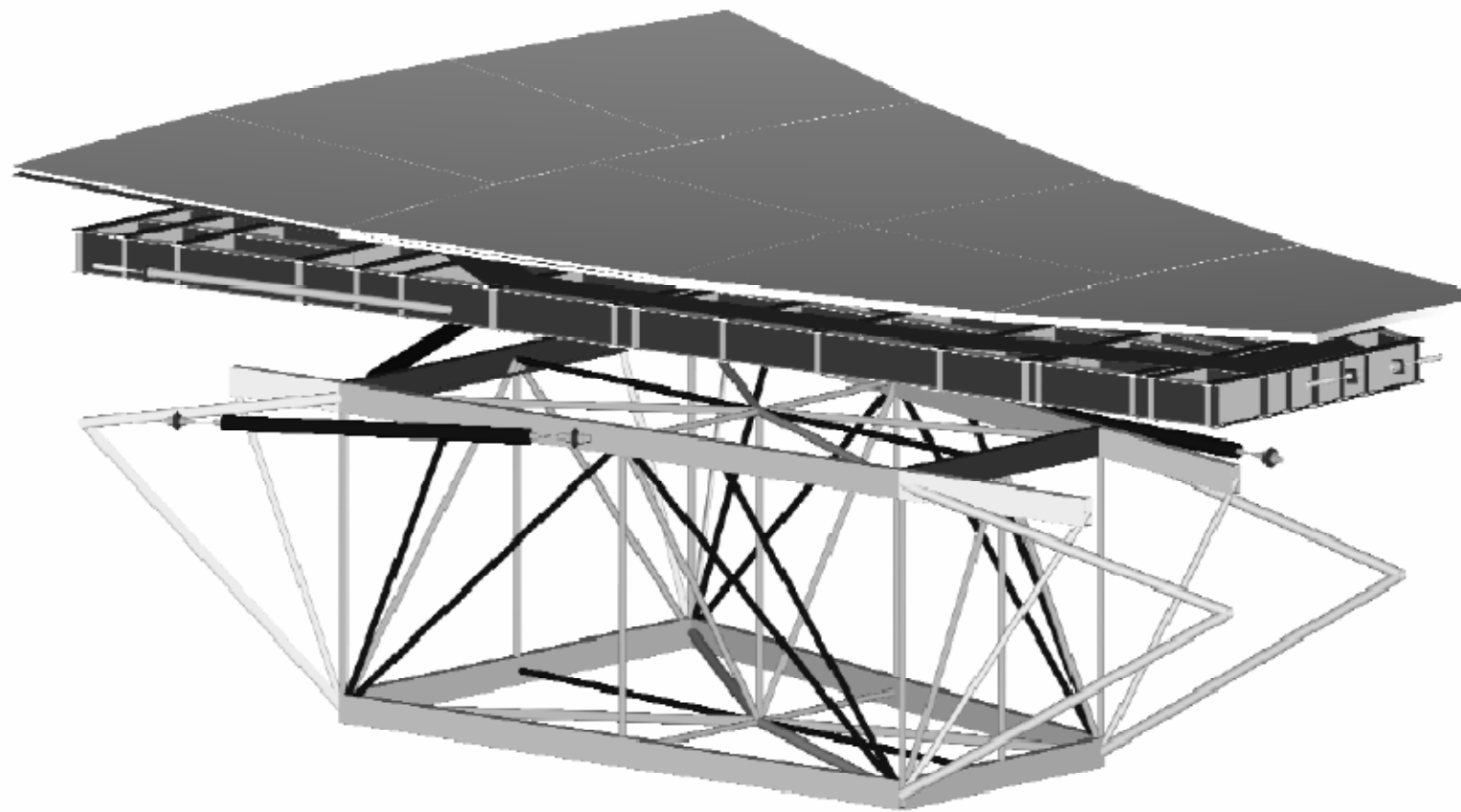


Surface segments



Sector of typical panels





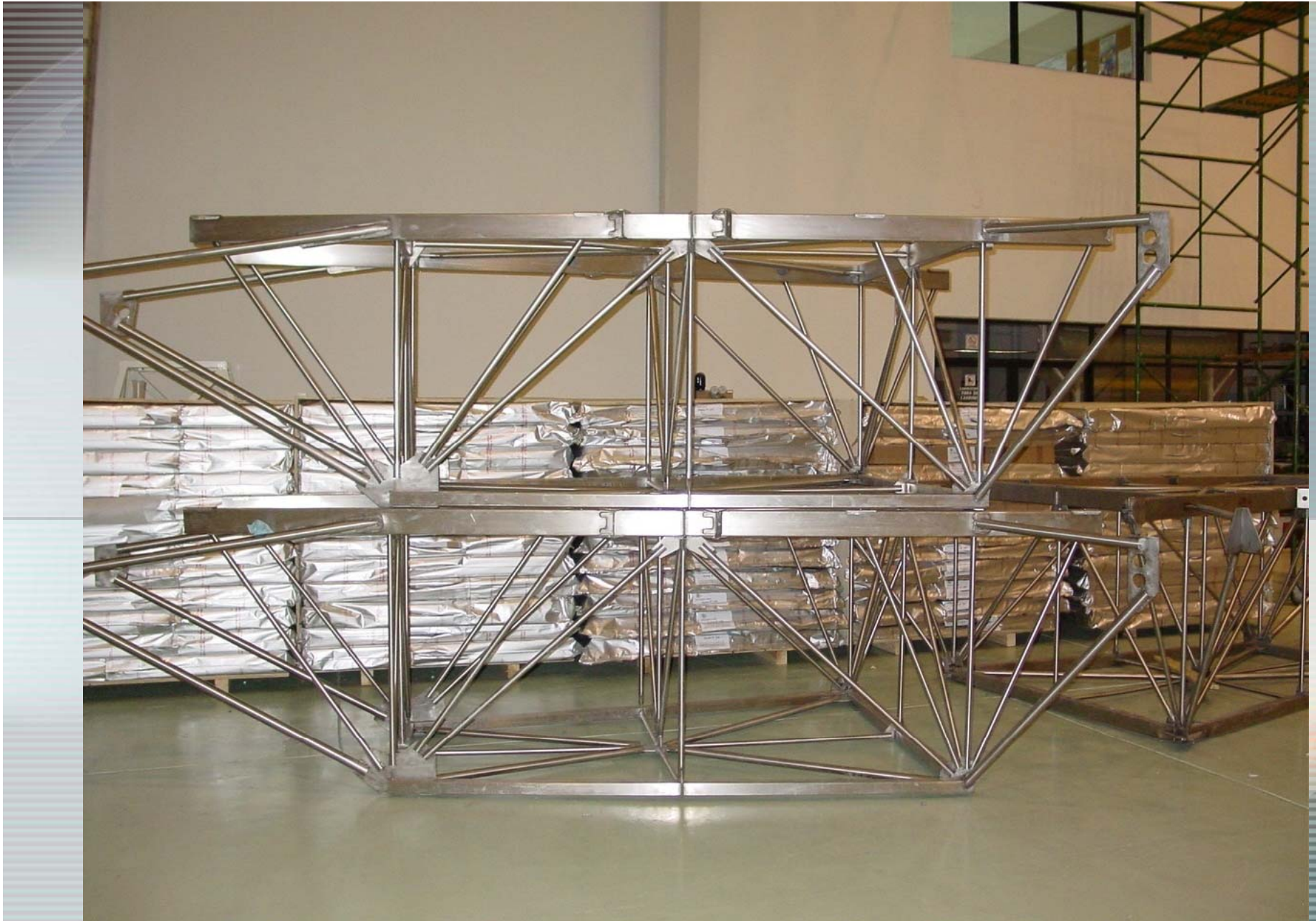
Typical surface segment



MOBILIO PERSONAL







Marcos de acero

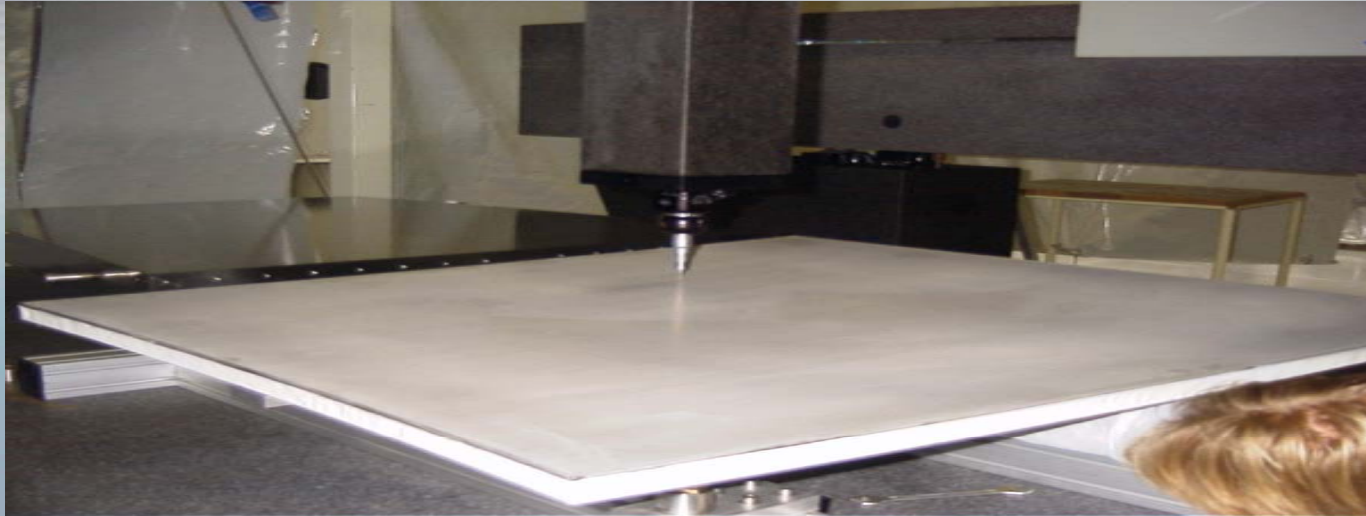


Adjusters

PANELS

Membranas de níquel electroformado







Barras laterales

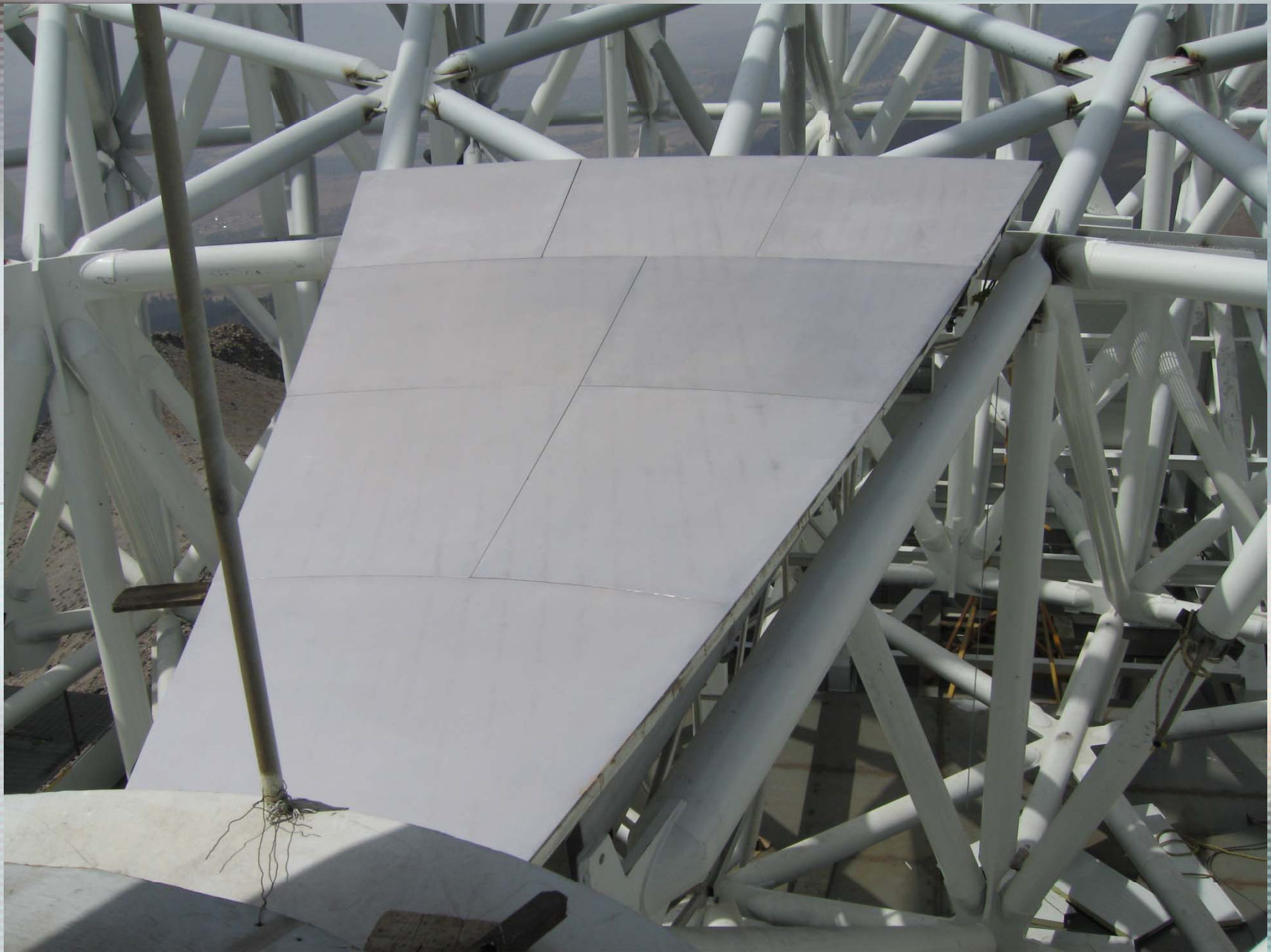
Ajustadores



Barras axiales



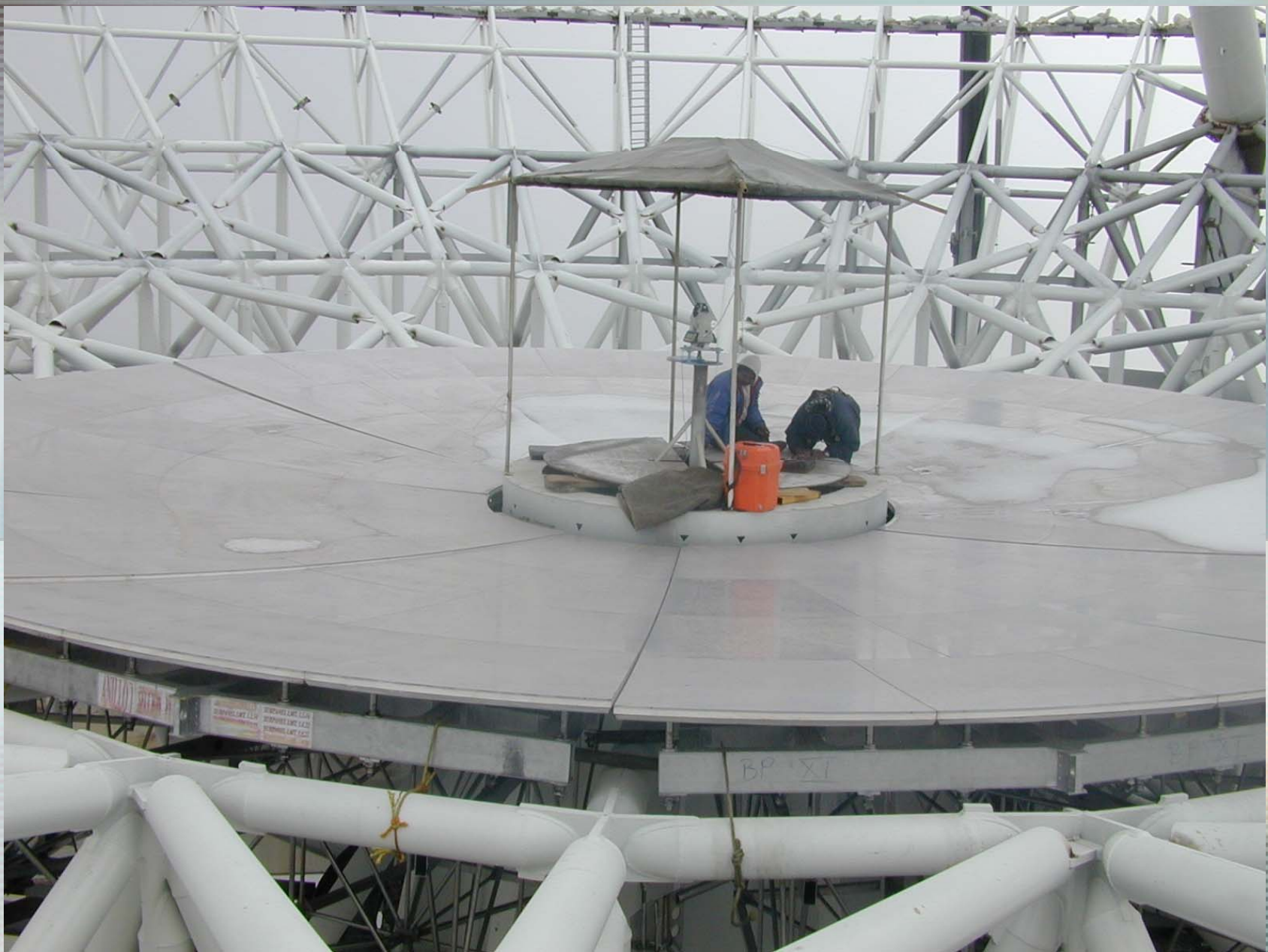




Primer panel instalado



Paneles del anillo 1



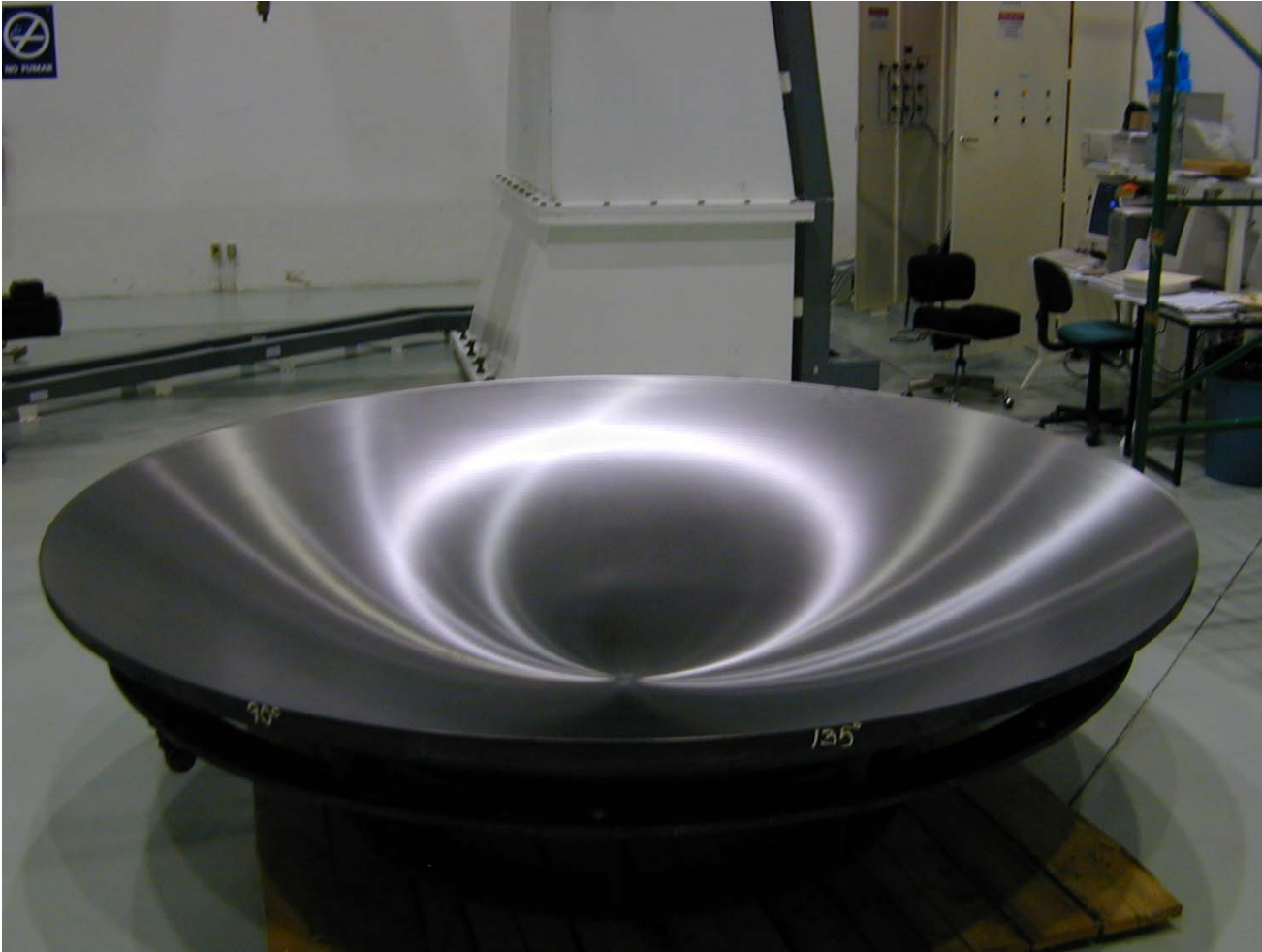
Alineando paneles del anillo1



INAOE

Pulidora para el molde del secundario.

Precisión del molde es 9.5μ rms

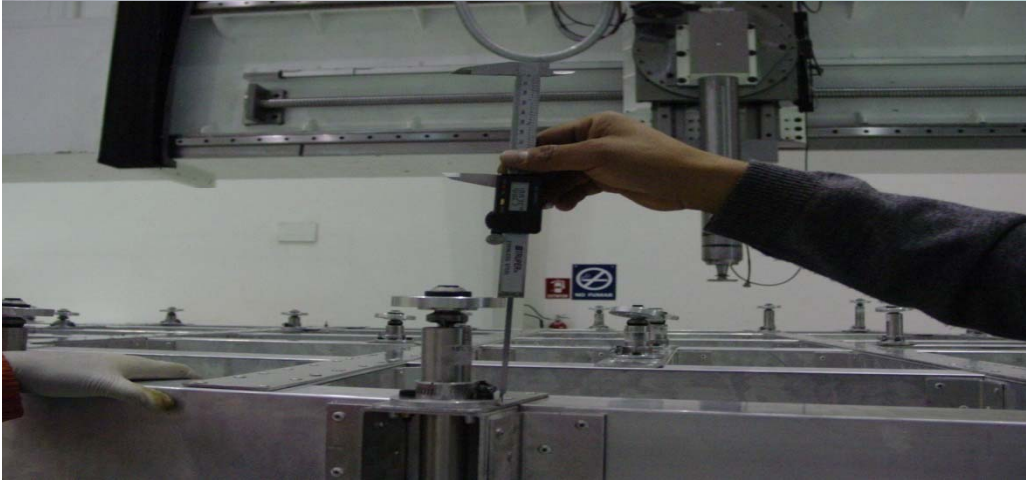


INAOE

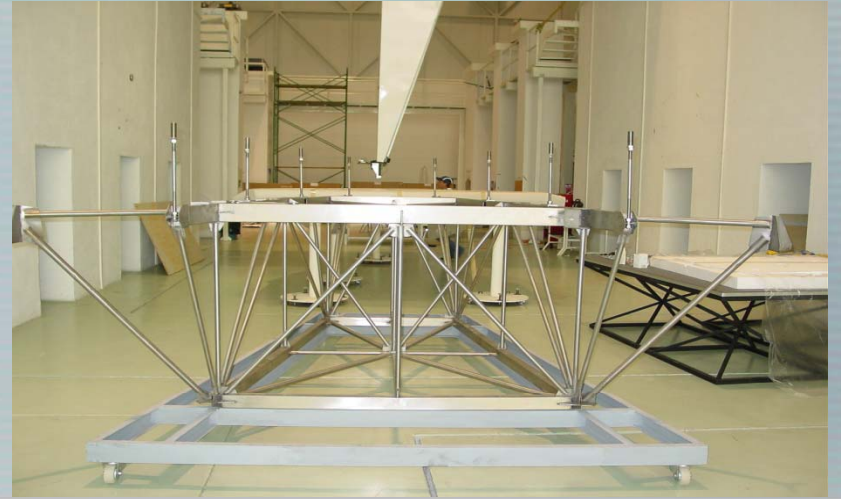
INAOE construye el reflector secundario.

Metrología

Ajustadores



Subframes



Alineación con máquina de medición tridimensional certificada



Baseplates





INAOE

Máquina de medición de coordenadas



Reflector secundario de fibra de carbono



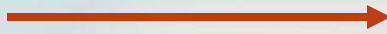
10 11:51AM



7 12:19PM



Parte trasera



Parte reflectora de 2.61
m de diametro





Dr. Gustavo Chapela, Director General de CONACYT, en mayo de 2006

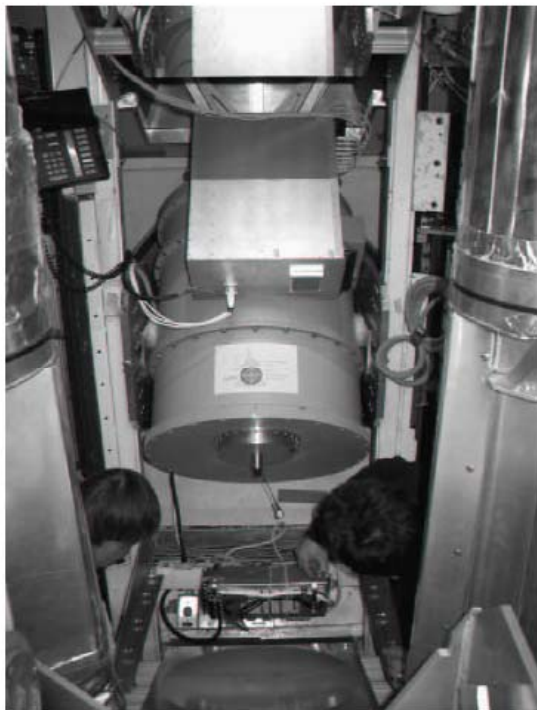


Figure 9. (left) AzTEC in receiver cabin of the JCMT during commissioning in 2005; (right) AzTEC map of OMC1 source at 1.1 mm wavelength.

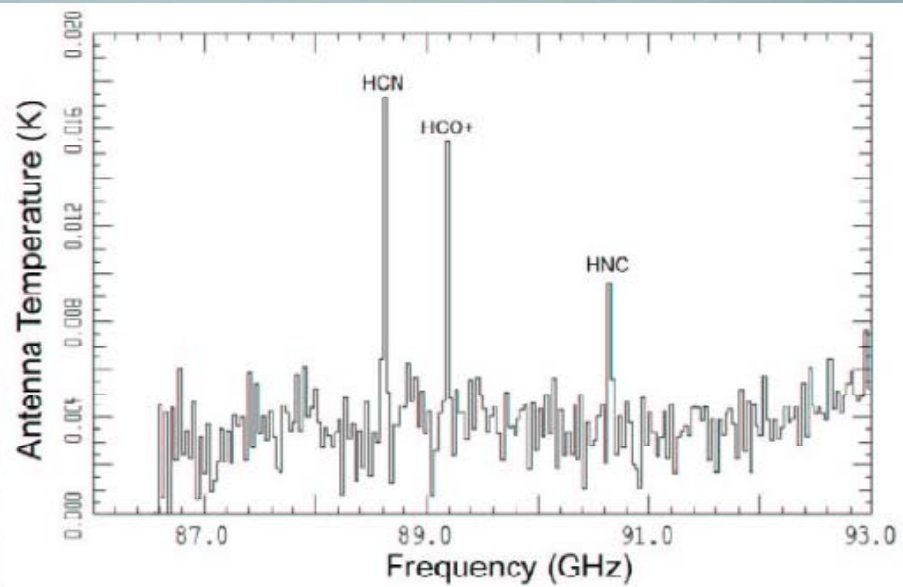
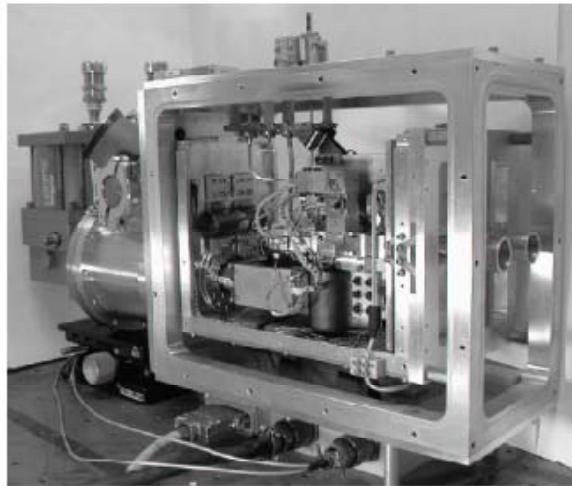
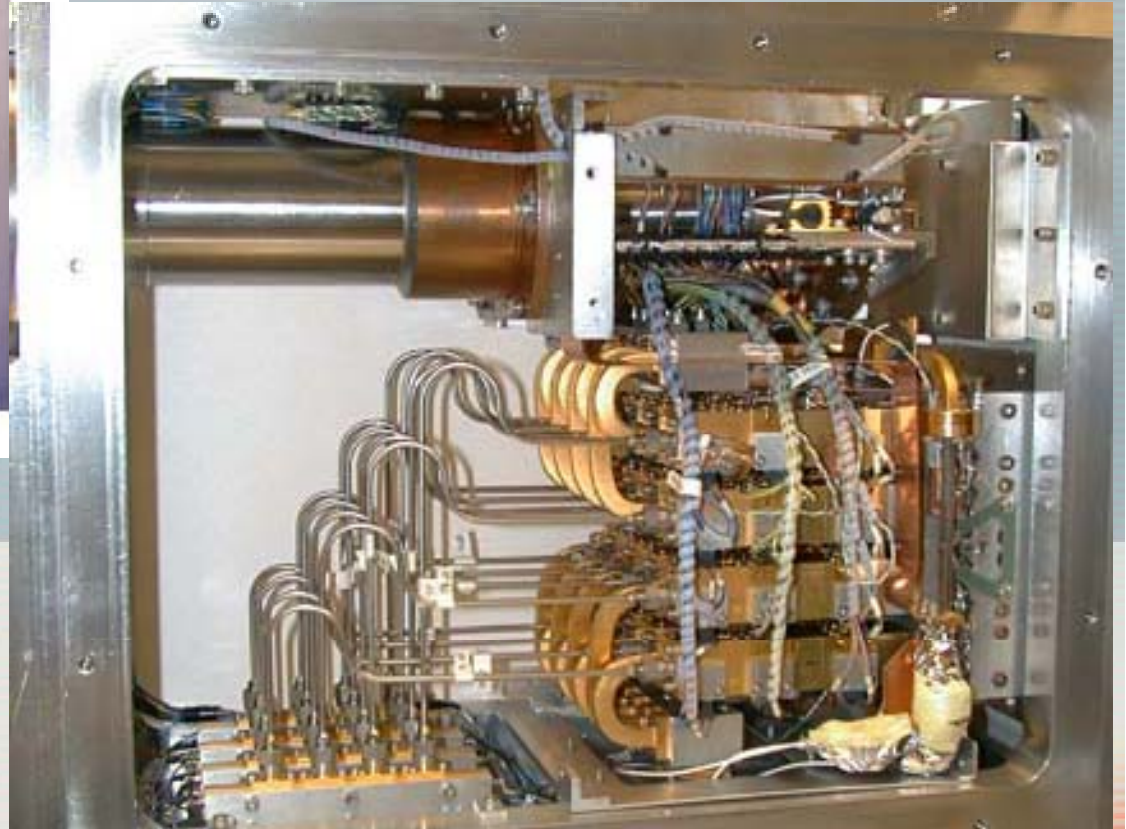
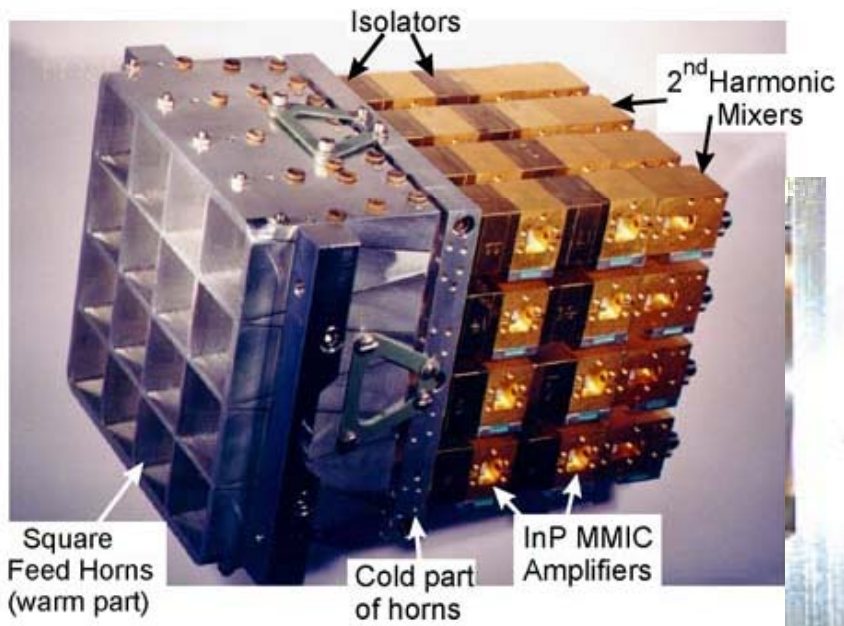
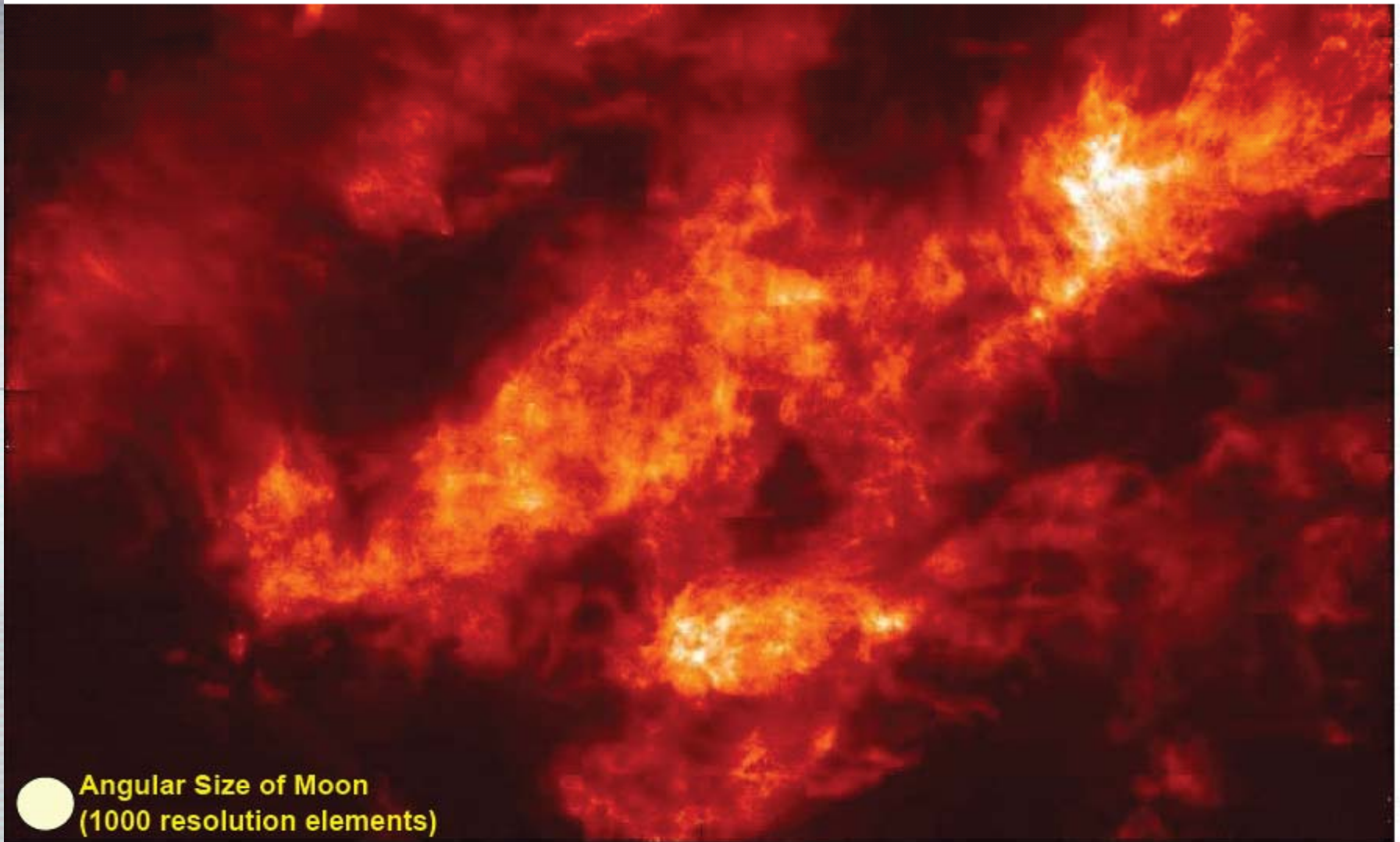


Figure 10. (left) Photograph of Redshift Search Receiver dewar interior; (right) Test observation of 6 GHz portion of the spectrum of IC342, showing millimeter-wave spectral lines of HCN, HCO⁺, and HNC.

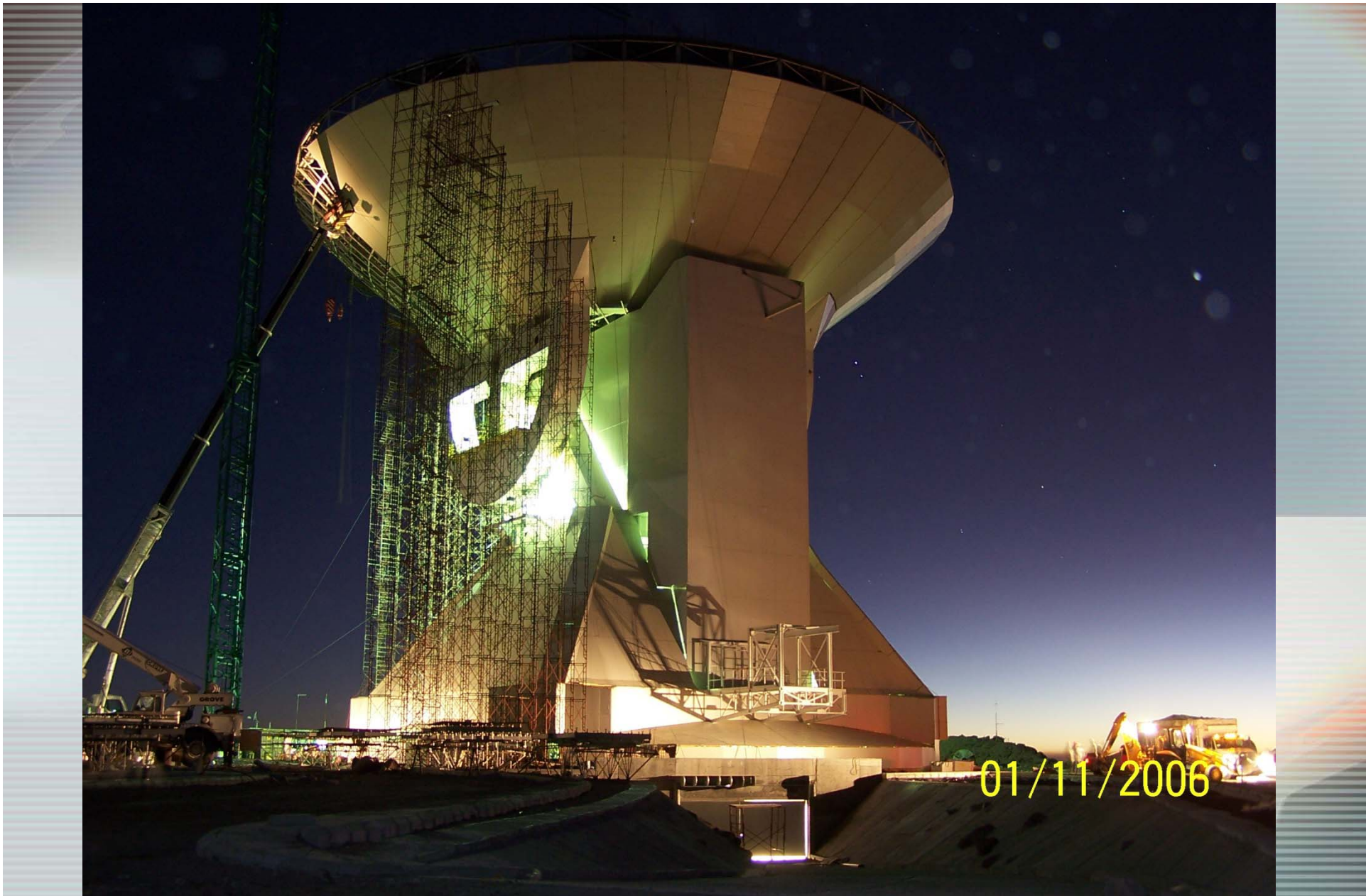
SEQUOIA



Taurus Molecular Clouds observed with UMass 14m Antenna and SEQUOIA



4 2 0 -2 -4
R.A. Offset (deg.)



LA CUBIERTA PROTECTORA FUE TERMINADA EN NOVIEMBRE 2006

Current

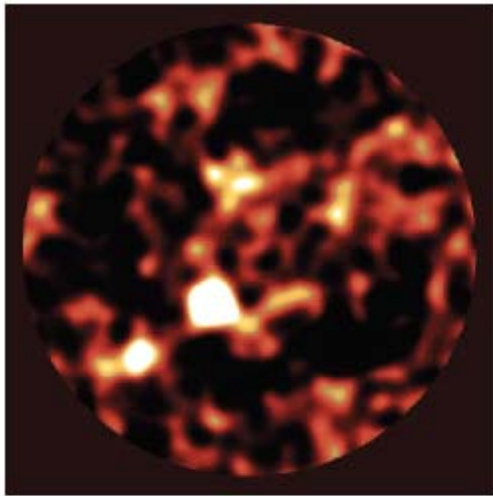
State of the Art

James Clerk Maxwell Telescope

6 square arcmin

50 hours

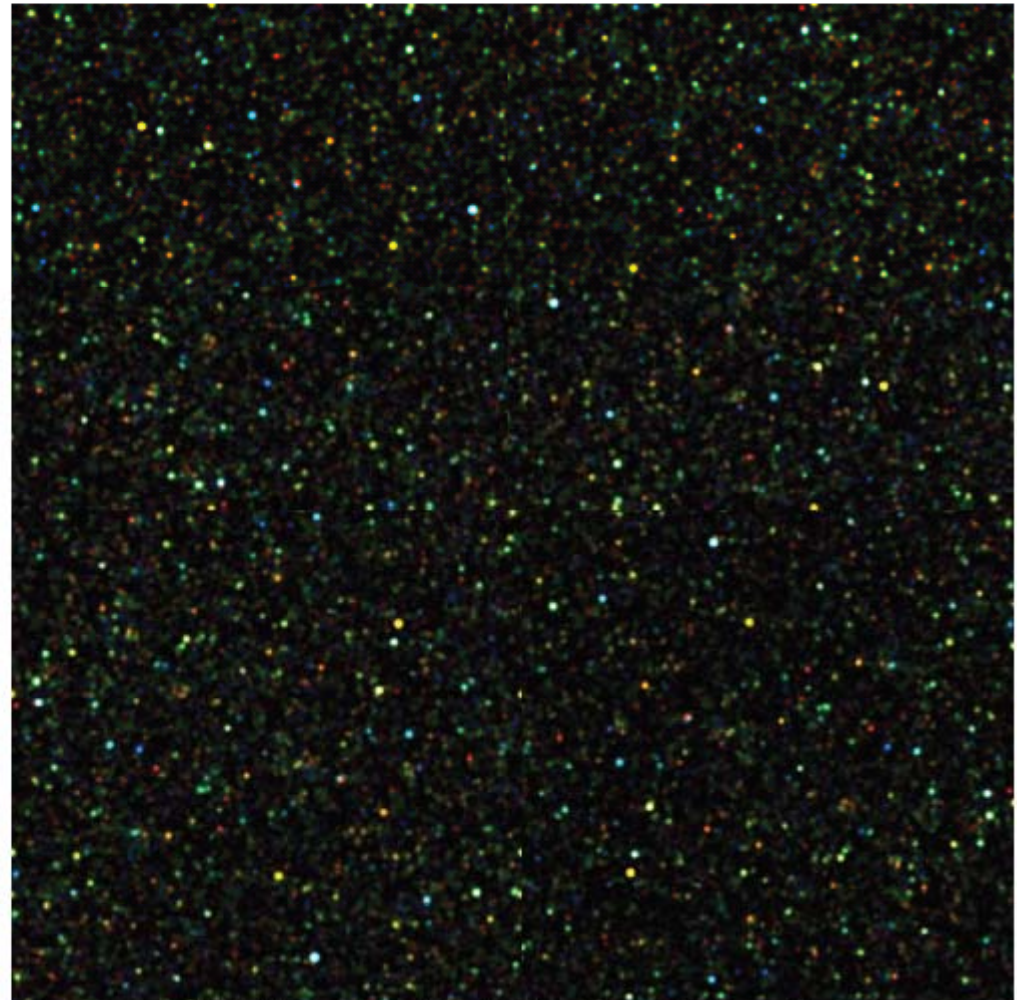
1-sigma = 0.6 mJy



Ref: D. Hughes *et al*
Nature 1998

~5 sources detected
~500 citations to paper

LMT SURVEY OF 25 Square Arcmin



50 Hours with 1-sigma=0.02 mJy

LMT Detects > 600 sources

Time for ALMA to complete the same field ...

- To same flux sensitivity: 100 hours
- To same brightness sensitivity: 10000 hours



Quantitative Comparisons of Other MM-wave Telescopes relative to LMT

Red indicates that LMT is better

<i>Telescope Type Year of Operation</i>	<i>GBT Single 2006</i>	<i>CARMA Array 2006</i>	<i>LMT Single 2007</i>	<i>ALMA Array 2008</i>	<i>ALMA Array 2012</i>
<i>Sensitivity to Point Sources</i>					
<i>Line (3mm)</i>	0.6	2.5	1.0	1.1	0.3
<i>Continuum (1mm)</i>	-	19	1.0	2.9	0.7
<i>Sensitivity to Extended Emission</i>					
<i>Line (3mm)</i>	2.3	3.3	1.0	3.3	2.5
<i>Continuum (1mm)</i>	-	25	1.0	8.8	6.6
<i>Mapping Speed (Point Sources)</i>					
<i>Line (3mm)</i>	15	4.5	1.0	1.1	0.1
<i>Continuum (1mm)</i>	-	1108	1.0	34	2.2
<i>Mapping Speed (Extended Emission)</i>					
<i>Line (3mm)</i>	348	7.7	1.0	10	5.8
<i>Continuum (1mm)</i>	-	1908	1.0	324	182

LMT compares favorably with ALMA and will compete with ALMA as the best place for certain experiments

- El impacto en la tierra de un asteroide con un diámetro de 140 metros sería equivalente a la explosión de una bomba de 500 megatonnes. Suficiente para destruir una ciudad grande y para crear un tsunami de 100m de altura. Hay alrededor de 500,000 asteroides, de los cuales unos pocos miles tienen probabilidades altas de impactar a la tierra en menos de 50 años



ESTADO ACTUAL DEL RADIOTELESCOPIO

