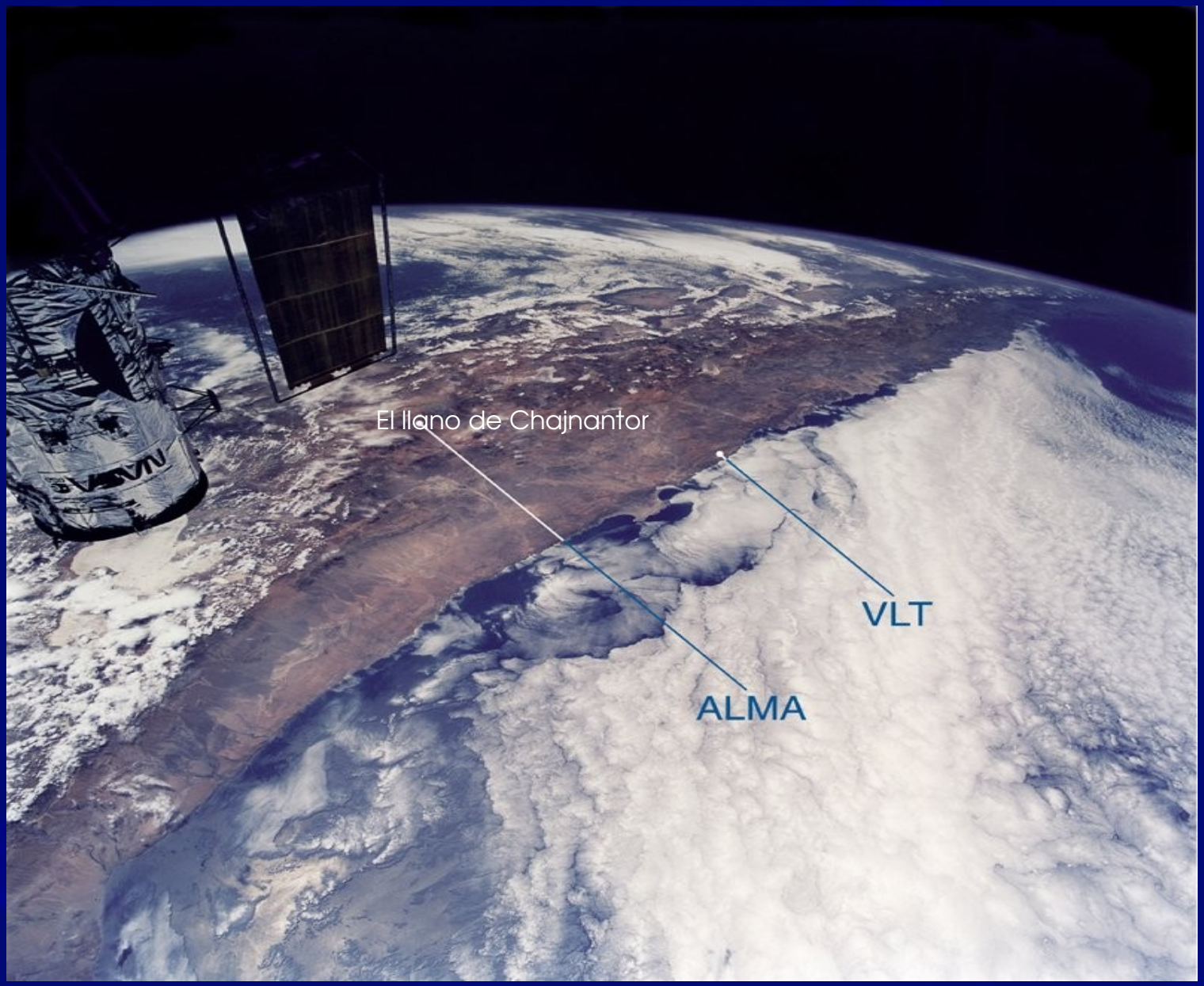
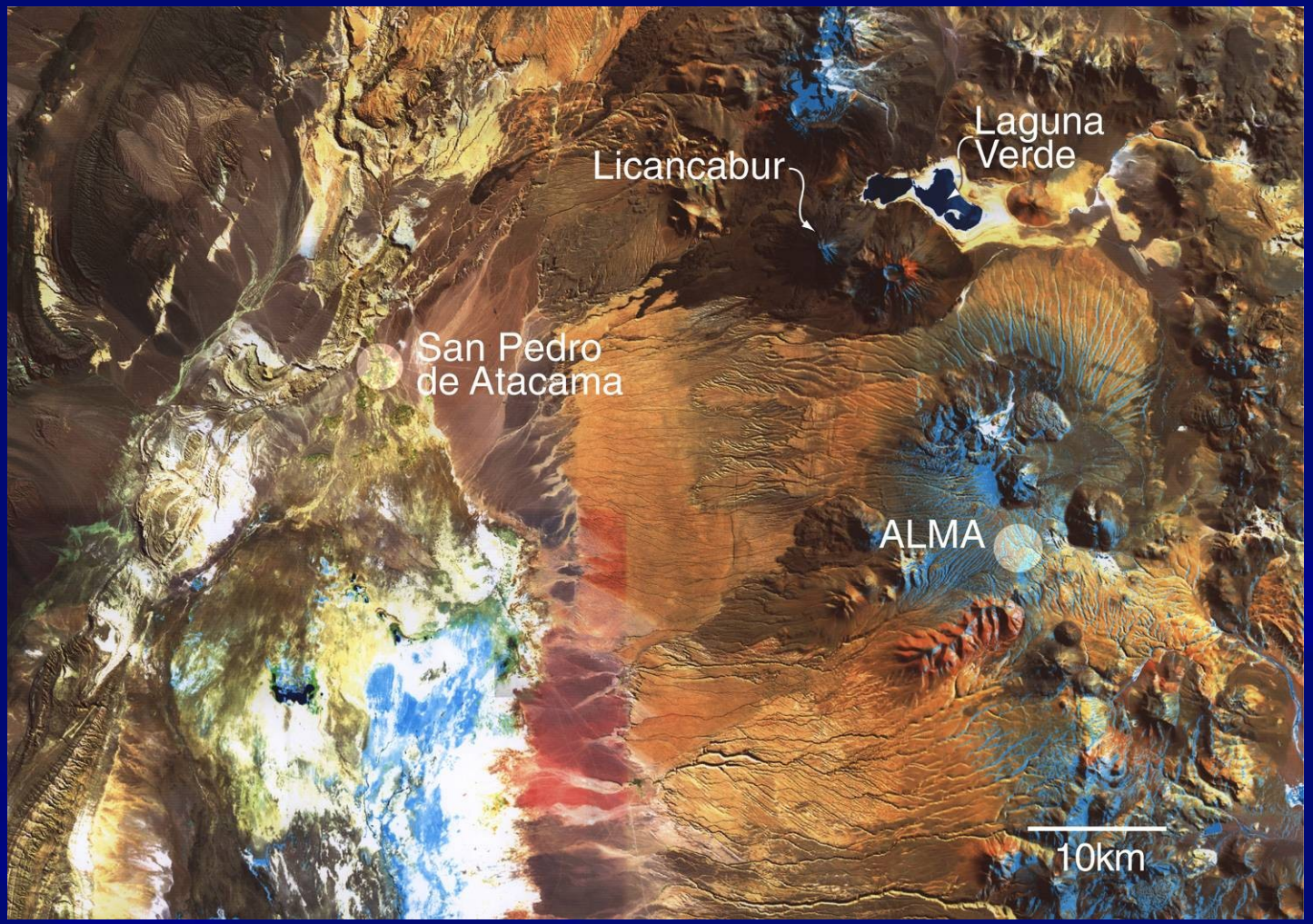
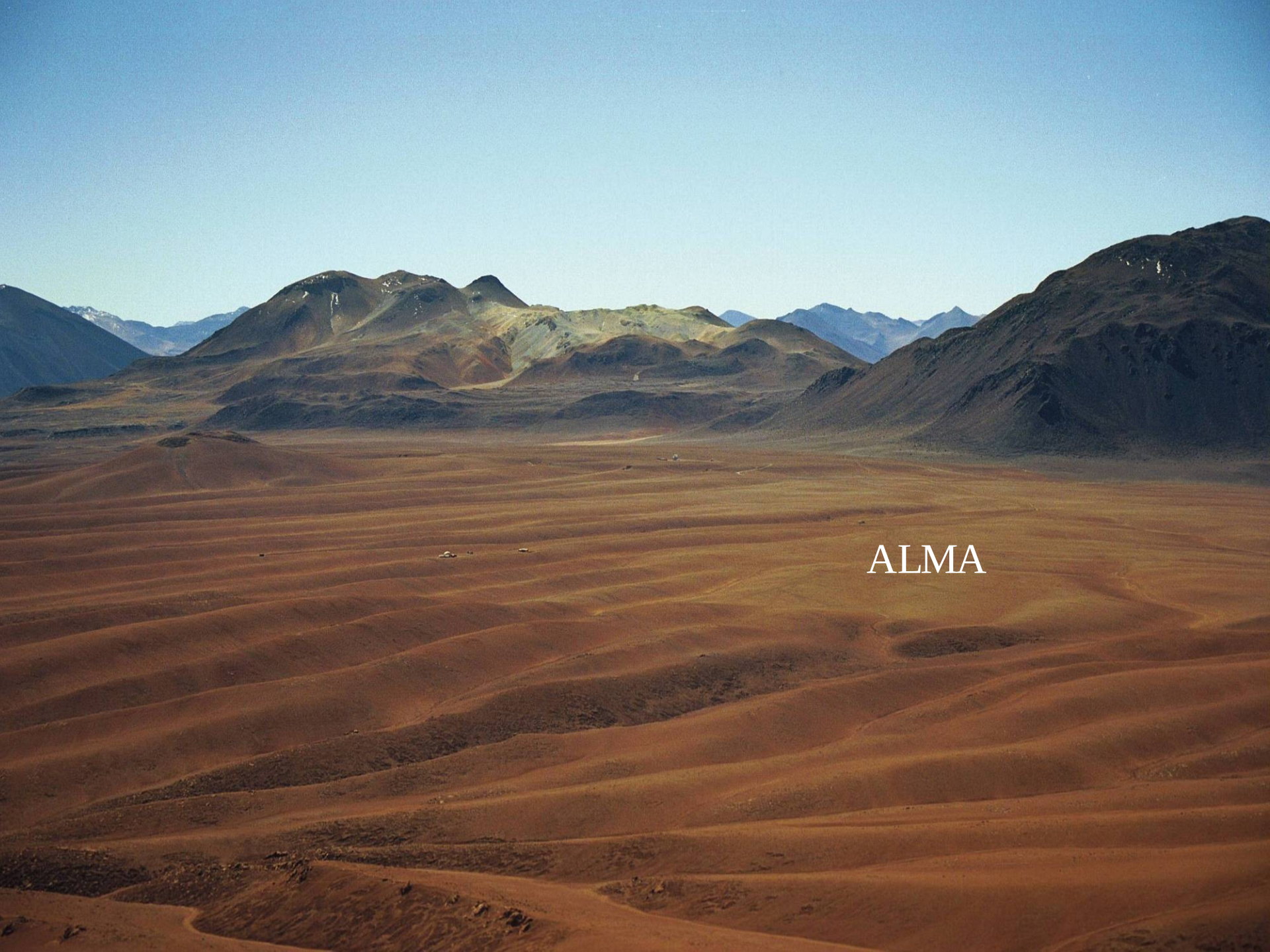
ALMA Project Status

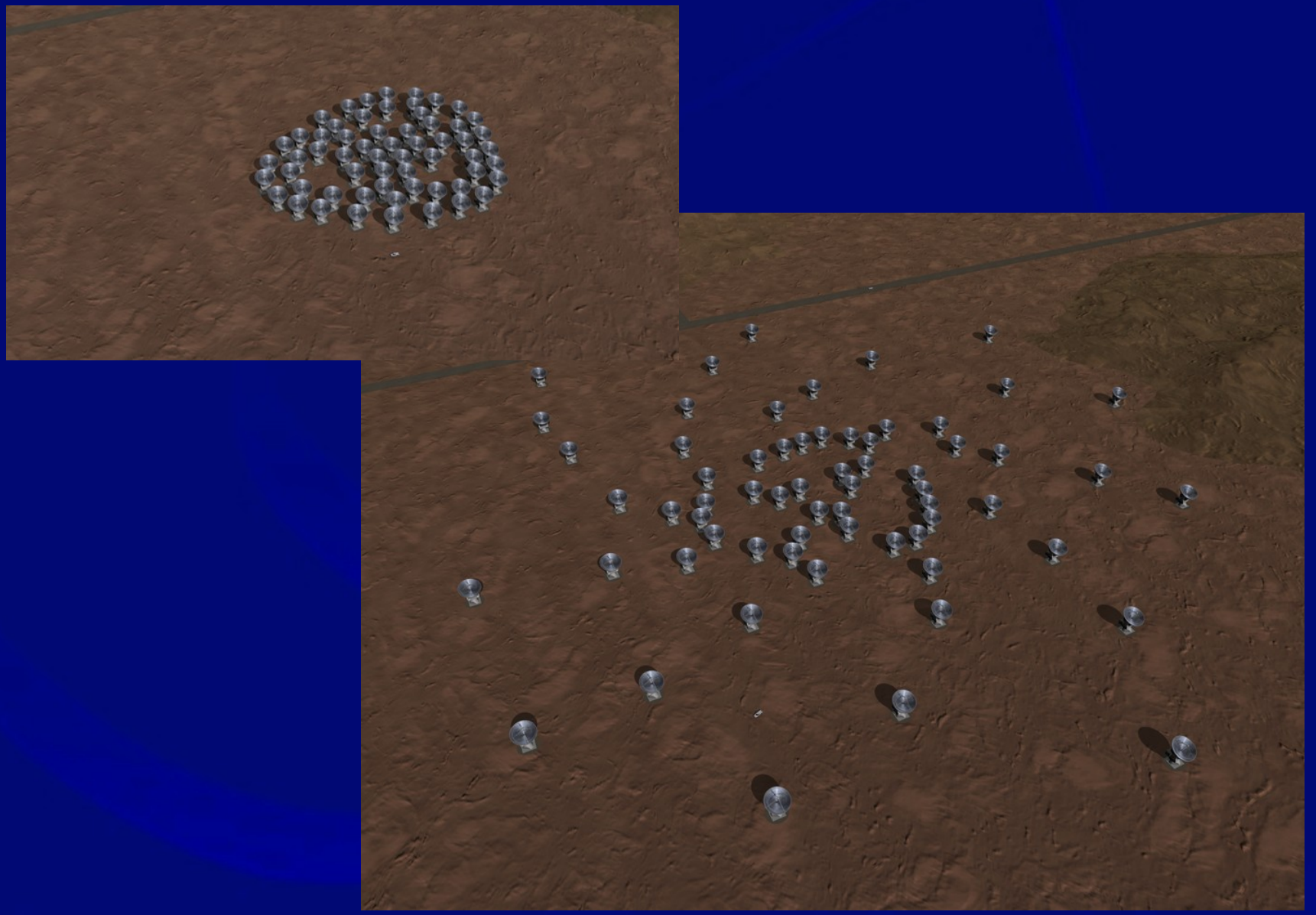
Adrian Russell

Where is ALMA?




Laguna
Verde
Licancabur
San Pedro
de Atacama
ALMA
10km


ALMA



What is ALMA?

- Baselines from 15m to 15km
- 5000m site in Atacama desert
- Receivers: low-noise, wide-band (8GHz), dual-polarisation, SSB
- Digital correlator, >=8192 spectral channels, 4 Stokes
- Sensitive, precision imaging between 30 and 950 GHz
  - 350 GHz continuum sensitivity: about 1.4mJy in one second
  - Angular resolution will reach ~40 mas at 100 GHz (5mas at 900GHz)
  - First light system has 6 bands: 100, 230, 345 and 650GHz
  - Japan will provide 140, 460 and 900GHz
- *10-100 times more sensitive and 10-100 times better angular resolution compared to current mm/submm telescopes*

ALMA Construction

- ALMA construction has started in earnest
  - North America and ESO have each placed contracts for at least 25 antennas; Japan has a contract for three 12m antennas (with the remaining 12m and 12 x 7m antennas to follow)
  - Site construction has started both on the mid-level Observation Support Facility (OSF) and on the Array Operations Site technical building (AOS) at the 16,500 foot site itself
  - The road to the site is over 85%percent complete

ALMA Status

ALMA has just undergone a major rebaselining and subsequent review

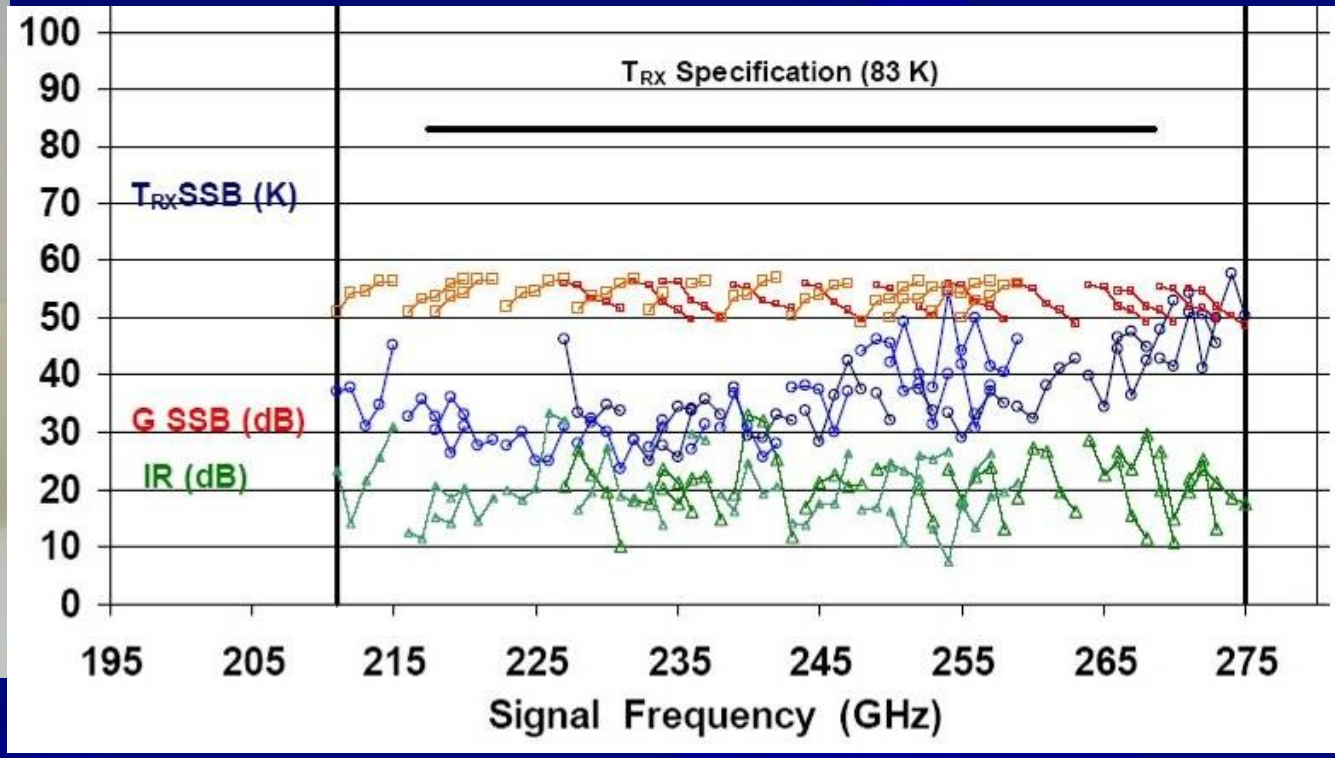
The review declared the technology readiness of ALMA very high and judged that most technical risk has been eliminated

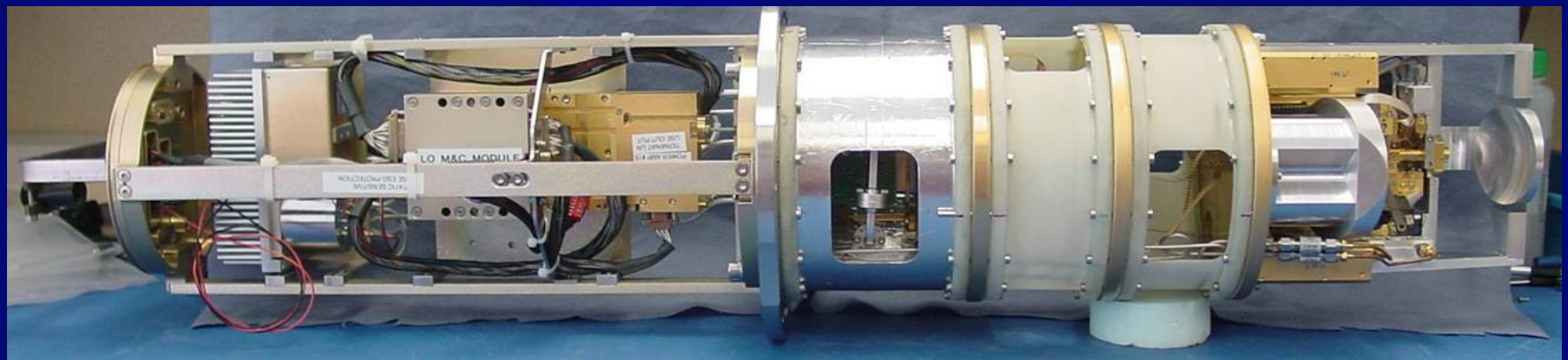
Five years ago ALMA was a "must do" scientifically but with high technical risk pushing the state of the art

We now have:

- prototype antennas that meet ALMA's demanding requirements
- receivers with near quantum-limited performance, unprecedented bandwidth and no mechanical tuning
- the first quadrant of the correlator completed below cost and with enhanced performance
- The baseline includes appropriate contingency for remaining technical risks (e.g. photonic local oscillator, cold multipliers, ortho mode transducers)

ALMA
ATACAMA LARGE MILLIMETER ARRAY


100
90
80
70
60
50
40
30
20
10
0
T_{RX} Specification (83 K)
T_{RX}SSB (K)
G SSB (dB)
IR (dB)
195
205
215
225
235
245
255
265
275
Signal Frequency (GHz)


LO M&C MODULE

Latest update...

Progress continues to be excellent

Highlights

- Completion of Contractors Camp
- Start of ASO-TB work
- Prototype Systems Integration started in Socorro
- Contract signed for the antenna transporters

- ASIAA, Taiwan has entered the ALMA project through the signing of an agreement with ALMA-Japan
- ESO Council reconfirmed scientific imperative and affordability of ALMA
- Review of the rebaselined ALMA budget noted that "the science capability of the array was extremely exciting, and that ALMA remains an extremely exciting project for the future"


ALMA
2005/11/30


2005/12/13


2005/12/13


2005/12/13

ALMA
ATACAMA LARGE MILLIMETER ARRAY