

ESO

- Intergovernmental treaty organisation for astronomy
 - Founded in 1962, by 5 countries
 - Currently 14+2 Member States, may increase further

- Mission
 - Develop and operate world-class observing facilities for astronomical research
 - Organise collaborations in astronomy

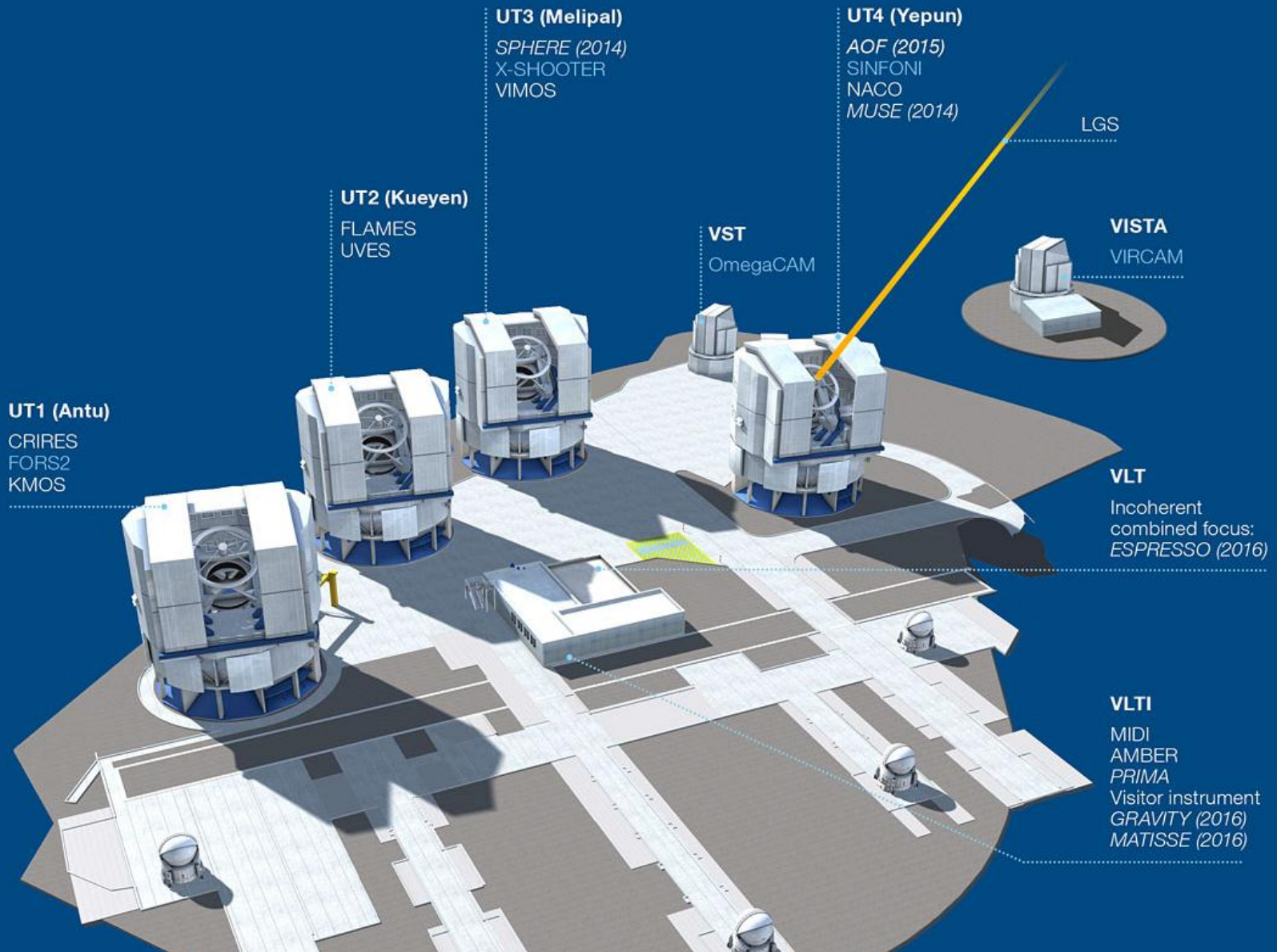


ESO's Programme

- Visual/infrared light
 - La Silla telescopes incl. 3.6m and NTT
 - VLT, VLTI, VISTA and VST on Paranal
 - E-ELT construction on Armazones
 - Instrumentation development
- Submillimeter radio waves
 - APEX & ALMA partnerships at Chajnantor
- High-quality user support



Paranal System



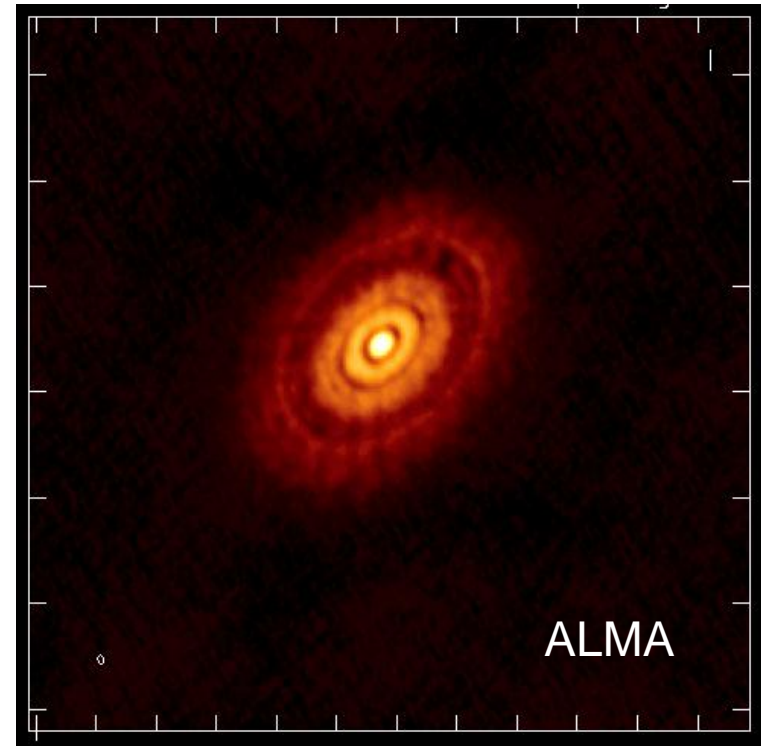
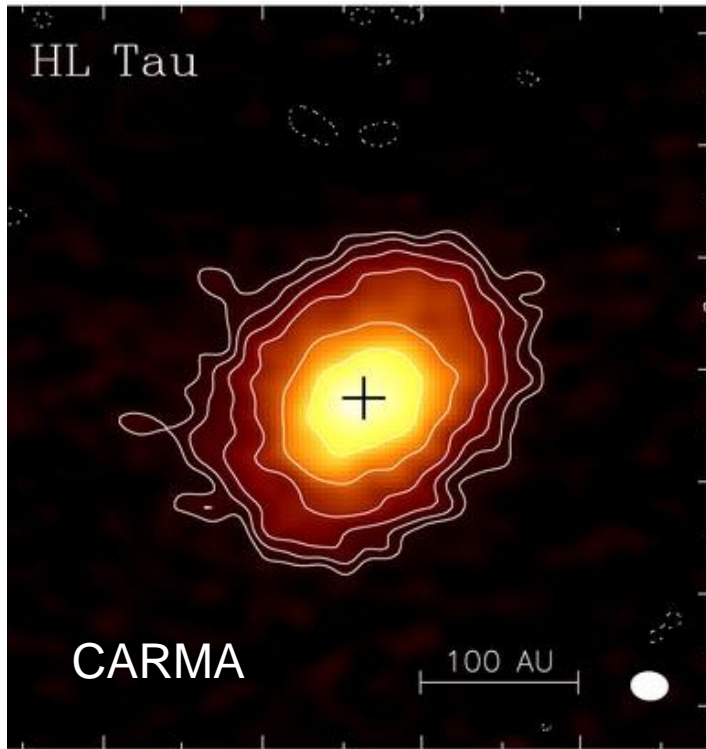
Paranal Instrumentation

- MUSE and SPHERE arrived in 2014
 - Tremendously powerful instruments
- More instruments to come
 - ESPRESSO, CUBES, CRIRES+, ERIS, MOONS for VLT
 - GRAVITY & MATISSE for VLTI
 - 4MOST for VISTA
- Ongoing infrastructure upgrades
 - Adaptive Optics Facility on UT4
 - Key components for VLTI
 - Incoherent combined focus for ESPRESSO
- Long-range plan
 - Upgrades and new instruments in budget through 2030

- Atacama Large Millimeter/submillimeter Array
 - 54 x 12m + 12 x 7m antenna's on Chajnantor at 5050m
 - 7 – 0.35 mm (30-900 GHz) in 10+ atmospheric windows
 - World's most powerful radio interferometer
 - Cold Universe: formation of planets, stars and galaxies

- Construction essentially completed
 - All equipment procured by Partners
 - ESO contribution corresponds to ~485 MEUR
 - Transition to full operations will take few more years





■ Transformational facility

- Superb Chajnantor site (5000m), state-of-the art receivers
- 66 antennas, baselines larger than 15 km

E-ELT

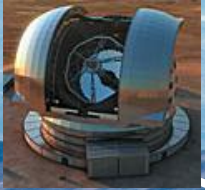
- Largest optical/infrared telescope in the world
 - 39m segmented primary mirror: transformational step
 - Science: exo-earth, deep universe, resolved populations
 - On Cerro Armazones, as part of the Paranal system

- Construction has started
 - Cost-to-completion 1104 MEUR (2014 prices)
 - Includes contingency and contribution to first instruments

- Funding
 - Regular ESO income
 - ~30% increase of contributions by 14 Member States
 - Accession of Brazil and Poland
 - Parliamentary ratification moving forward



Armazones and Paranal







18 January 2015, 1200 CET

Construction in Two Phases

- Council approved E-ELT construction in two Phases
 - Phase 1 affordable without Brazil
 - 39m E-ELT but not all instruments and capabilities at first light
 - First light late 2024 or soon after; cost 1012 MEUR
 - Phase 2 (92 MEUR) will complete baseline E-ELT
- Council authorized spending on Phase 1
- The two-phase approach is a back-up plan
 - Path to the E-ELT without Brazil, without additional MS contributions and without any new MS other than Poland
 - By design, Phase 1 starts deviating from baseline in 2017
 - Provides time for Brazil to join ⇒ return to baseline
 - This is the preferred way forward

This Workshop

■ Current programme

- Will deliver tremendous scientific results
 - Incl. synergy with GAIA, JWST, PLATO, EUCLID, Athena, ...
- Commits ESO's income for ~15 years

■ Many ideas for new ground-based facilities

- Some would be natural to do at ESO
 - Optical, radio or other 'messengers'
 - Can be 'all ESO' or in partnership
- Would require additional funding
 - From new MS or provided for the project by current MS, or both
 - Will need very powerful arguments in current financial climate

■ Important to start planning now

- Develop consensus on scientific priorities, taking into account global context