

Forward Look



50 YEARS REACHING NEW HEIGHTS IN ASTRONOMY



The Organization

■ Mission

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

■ This is achieved by

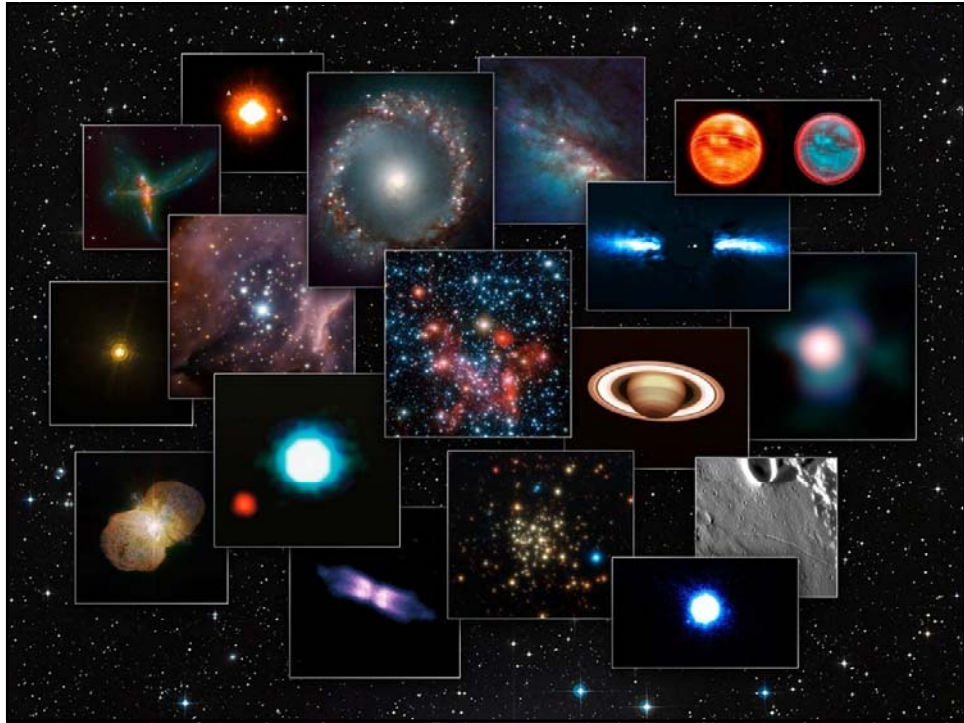
- Motivated and highly-skilled staff
 - Engaged and able to carry out a multi-project programme
- In-house science, engineering and support activities
 - Without these ESO becomes a management agency, the quality of the programme will suffer and support by the MS will decline
- Matched by effort in the Member States
 - In industry and in technical and scientific institutions
 - In good coordination with ESO

La Silla, where it all started



The Very Large Telescope





50 YEARS 1962-2012 **ESO**

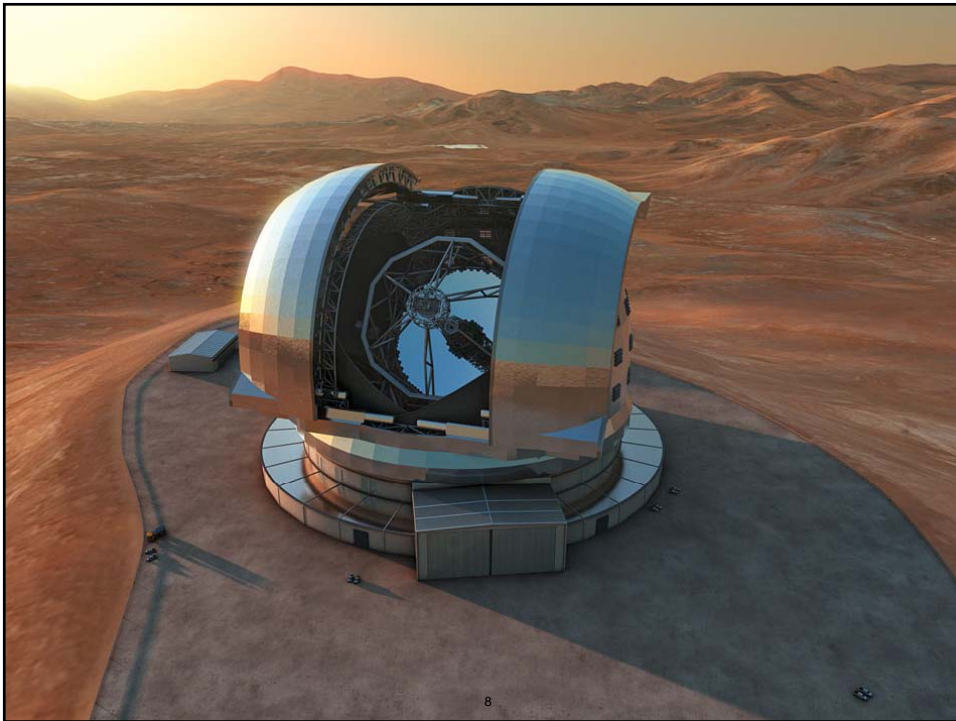
ALMA

The First 50 Years of ESO, 7 Sep 2012

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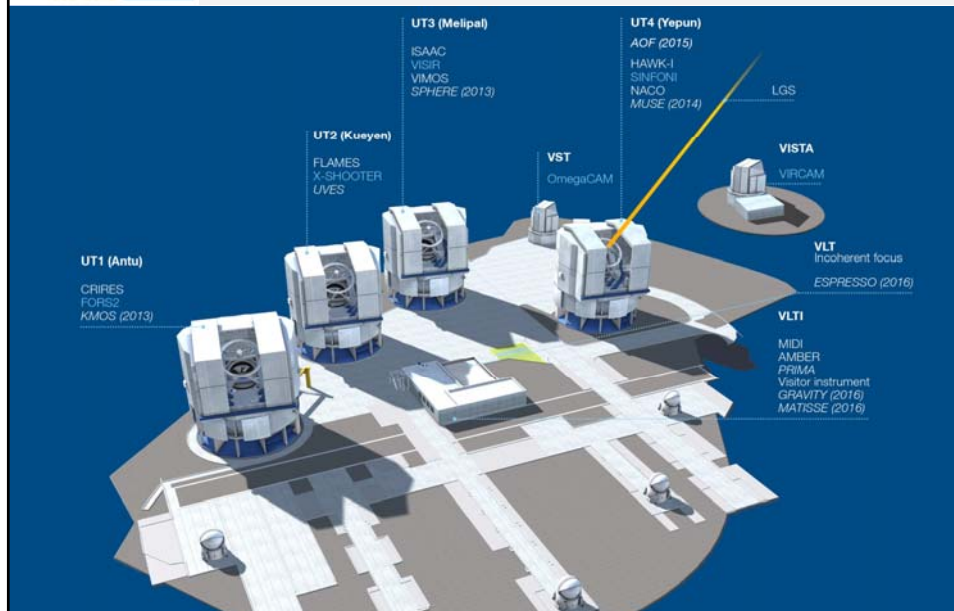
Armazones and Paranal



Perspective through 2025

- Keep the Paranal Observatory world-leading
 - Integrated system of VLT, VLTI, VISTA, VST...
 - Add the E-ELT on Armazones to this system
 - Long-term instrumentation plan
- Further develop ALMA on Chajnantor
- Continue successful partnership with community
 - Student and fellowship programme
 - Construction of instrumentation
 - Data archive including science products
 - Smaller telescopes and targeted experiments on La Silla
- Programme is affordable for the 15 Member States

Integrated System



2nd Generation Instruments

■ VLT

- KMOS: Near IR MOS, deployable IFUs (2013)
- SPHERE: XAO + Near IR/Vis planet finder (2013)
- MUSE: Visible IFU spectrograph (24 modules; 2014)
- ESPRESSO: High-resolution ultra-stable spectrograph at incoherent combined focus (can use all UT's; 2016)
- LGS upgrade (2013) followed by AOF (2015)
- Phase A studies: CUBES, ERIS, MOONS

■ VLTI

- PRIMA: astrometry at 10 μ as accuracy (2013+)
- GRAVITY: K Band, 4 tel. astrometry near GC (2016)
- MATISSE: L, M, N band, 4 tel. image/spec (2016)

E-ELT Instrument Roadmap

Year	ELT-IFU	ELT-CAM	ELT-MIR	ELT-4 (MOS or HIRES)	ELT-5 (MOS or HIRES)	ELT-6	ELT-PCS
2012	Decide science requirements, AO architecture.		VISIR start on-sky	Develop science requirements for MOS/HIRES			Call for Proposals for ETD
2013			TRL Review	Call for Proposals for MOS/HIRES			
2014							
2015				Selection ELT-MOS/HIRES		Call for Proposals	
2016							
2017							TRL check
2018							TRL check
2019						Selection	TRL check
2020							TRL check
2021							TRL check
2022 Tel. technical first light							
	Pre-studies taking the form of phase A or delta phase A work and/or ESO-funded Enabling Technology Development (ETD)						
	Decision point						
	Development of Technical Specifications, Statement of Work, Agreement, Instrument Start.						



Future of Astronomy

- New scientific questions will continue to emerge
 - Hard to predict which ones; paradigm shifts expected
 - Likely to see much activity in, e.g., the exoplanet field with a strong interdisciplinary link (origin of life)
- Use continued technology development to enable new and improved ways to observe the Universe
 - On the ground and from space
 - And also using particles, gravitational waves
- This provides opportunities for further ESO facilities
 - Assuming our society remains interested in science
 - Effective outreach and communication is critical for this
 - And ESO continues to provide high-quality 'products'
 - In continued good partnership with Member State institutions

The First 50 Years of ESO, 7 Sep 2012

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Context

- Global astronomy
 - Active community in North America
 - Supported by public and private funding
 - Well organized in the radio, less so in the optical/infrared
 - Rapidly growing programmes in Asia
 - Japan, Taiwan, South Korea, China, India, ...
 - Natural foci for optical/infrared
 - Mauna Kea with four 8-10m telescopes and TMT
 - Pachon with Gemini South and LSST/Las Campanas with GMT
 - Paranal-Armazones with VLT system and E-ELT
- Continued competition in O/IR is beneficial
 - Likely to lead to better and faster results ⇒ ESO should not become a 'world-lab' (like CERN)
 - Also because field is not focused on few experiments

The First 50 Years of ESO, 7 Sep 2012

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Strategy for ESO

■ Membership

- Moderate further growth by addition of Member States with high-quality scientific communities that are keen to join, bring added value, and have government support
 - Number of countries fit this today, others may need some time

■ Operational model

- Continue to build and operate world class facilities
 - Balance multi-purpose telescopes and experiments
 - Complemented by strong national programs in the Member States
 - Keeping the observatory staff well connected to the astronomy communities in the member states (mix of Service/Visitor mode)
- In some cases complementary to what is done elsewhere
 - E.g., a 12-15m wide-field spectroscopy facility instead of LSST2
- In good coordination with space observatories

