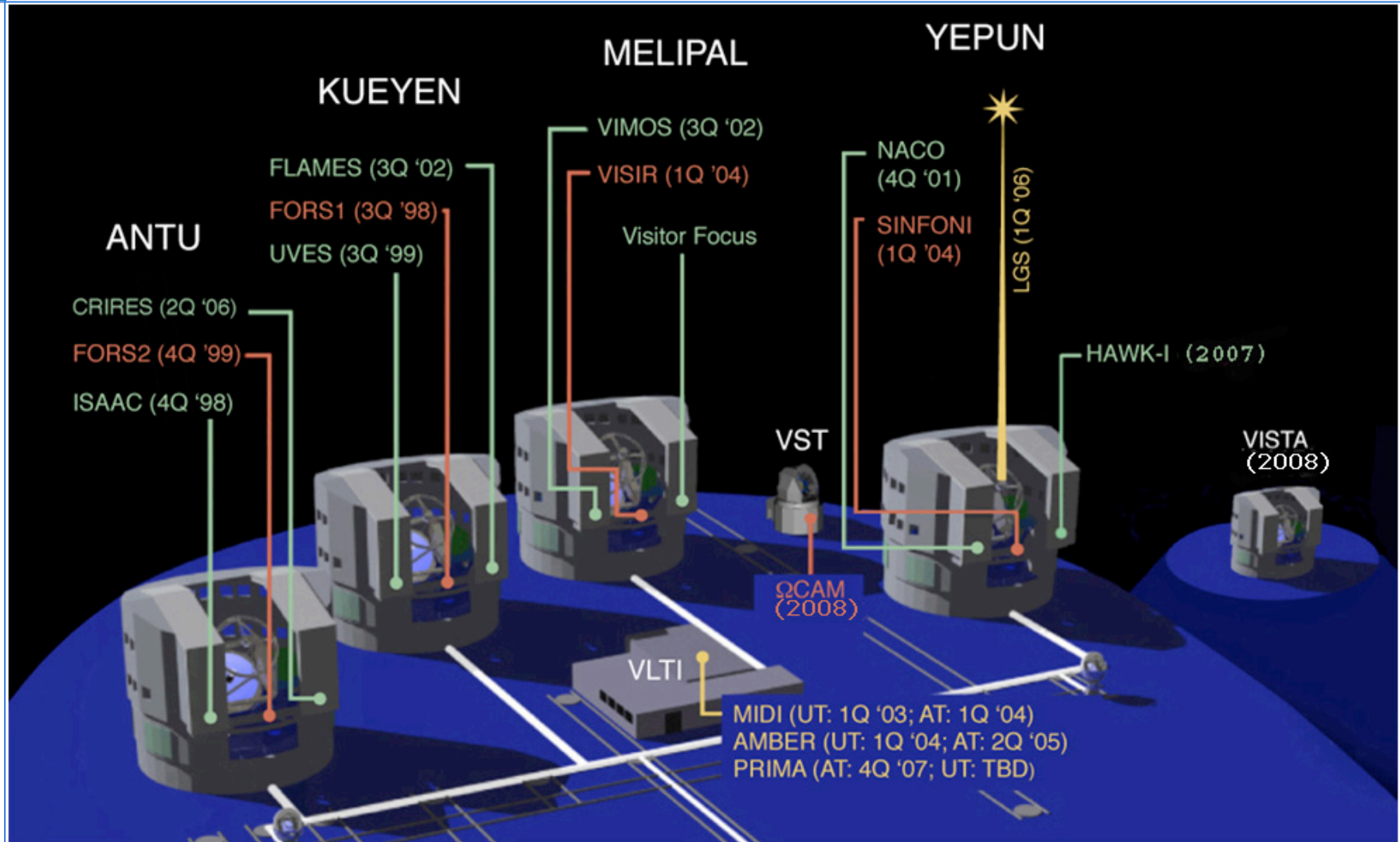
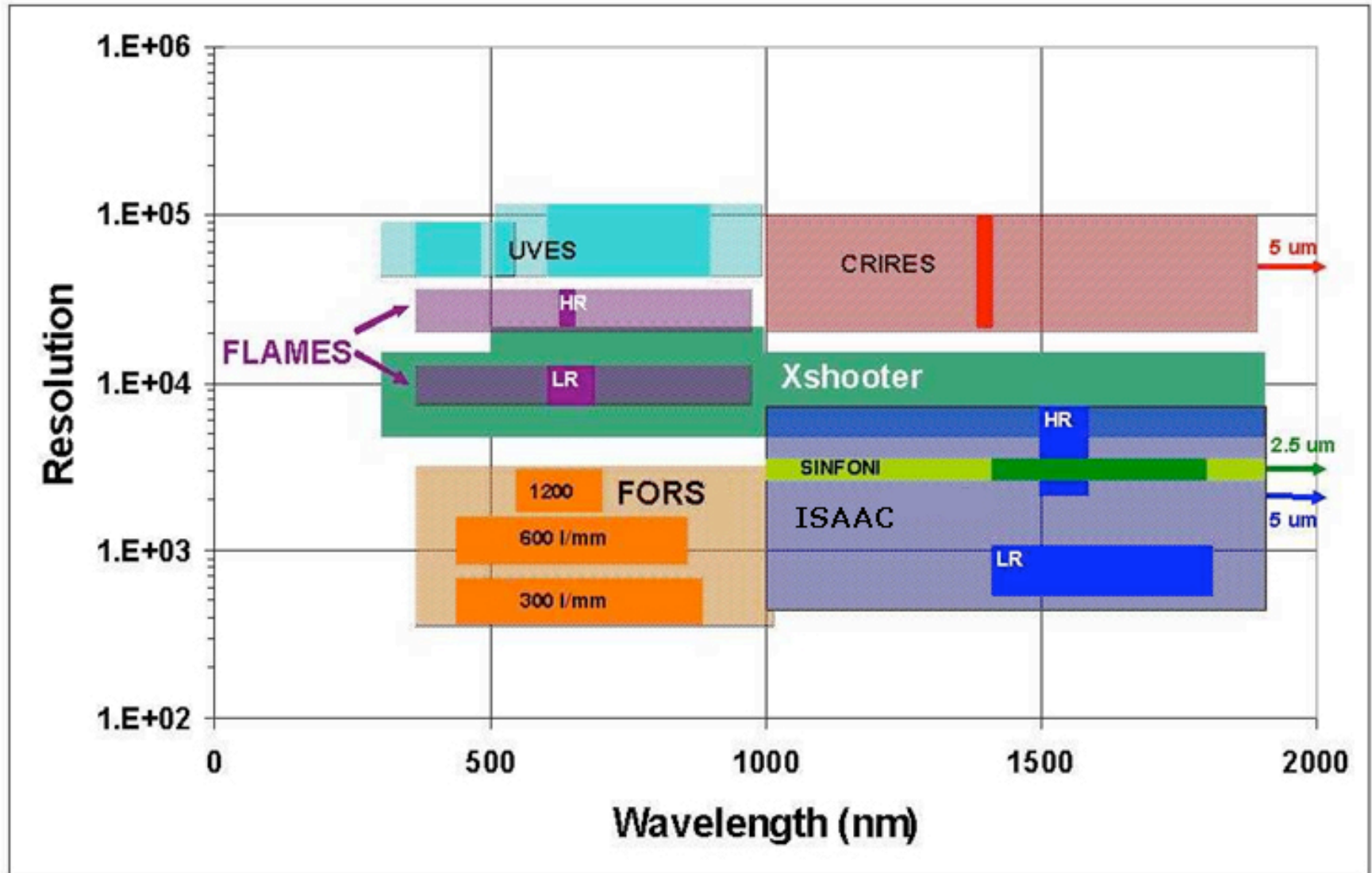




# Integrated System



# Coverage in $\lambda$ and $\mathcal{R}$



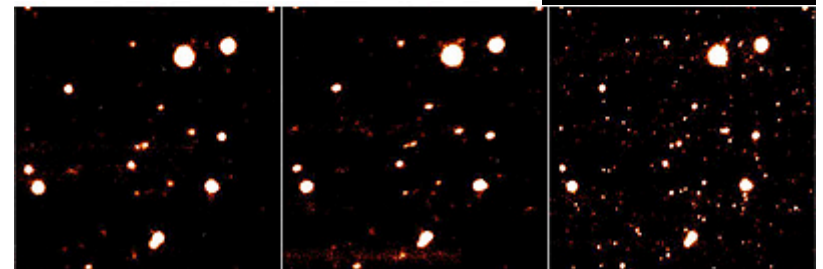
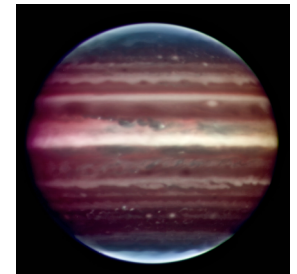


# 2<sup>nd</sup> Generation Instrumentation

- Approved VLT instruments in development
  - X-Shooter – Single object UV-IR spectrograph
  - KMOS – Near IR MOS, deployable IFUs
  - SPHERE – XAO + Near IR/Vis planet finder
  - MUSE – Visible IFU spectrograph (24 modules)
- New VLTI instruments
  - PRIMA: integration on schedule
  - GRAVITY – K Band, 4 telescope, astrometry near GC
  - MATISSE – L, M, N band, 4 telescope image/spec
  - VSI later (4-6 telescope near IR ‘imager’ spectrometer)
- One or more additional VLT instruments planned
  - High-resolution ultra-stable spectrograph

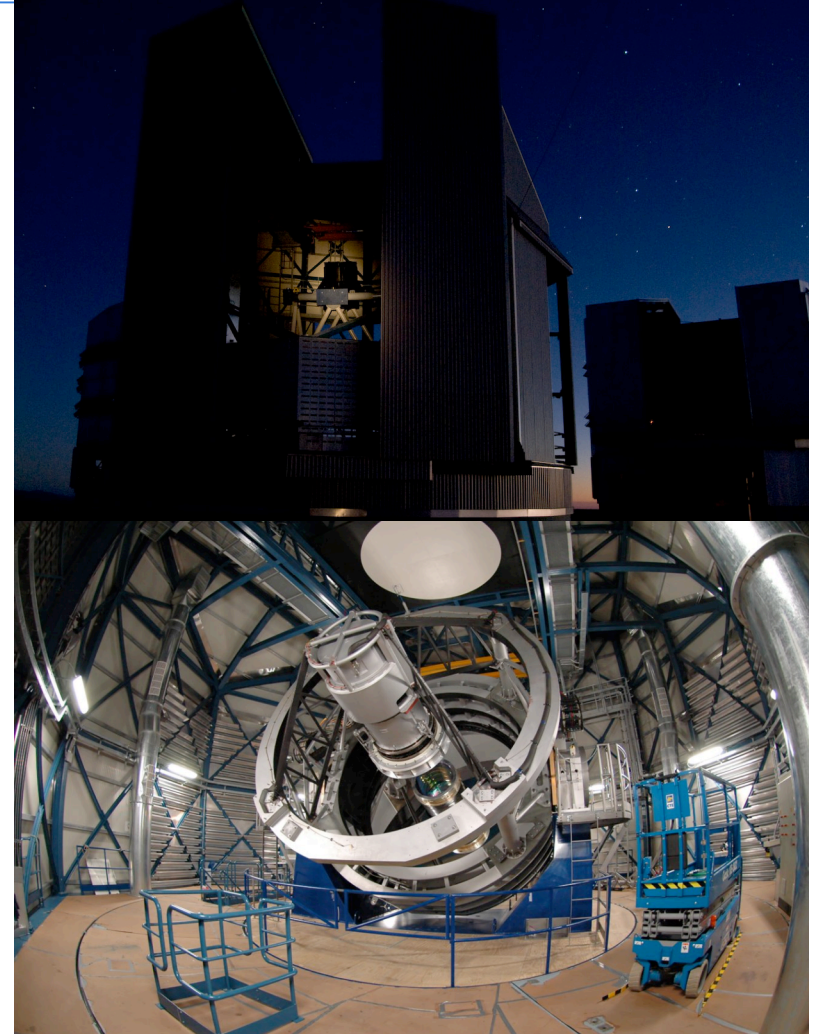
# Long-term Program

- Long-range plan
  - Continuous upgrades through at least 2020
- Most instruments built by consortia
  - ESO pays hardware costs (~1/3<sup>rd</sup> of total)
  - Consortia provide fte's; paid in Guaranteed Time
  - ~250 nights for 2<sup>nd</sup> generation instruments
  - Used for coherent science programs
- Development program
  - MCAO Demonstrator
  - Laser Guide Star Facility
  - Fully adaptive M2 for UT4



# The Survey Telescopes

- Under construction
  - VST 2.6m for optical
  - VISTA 4.1m for infrared
  - Expect VISTA in late 2008, VST in 2009
  
- Science
  - Coherent 5-year program of public surveys
  - Coordinated by ESO
  - Develops European survey capability (LSST?)



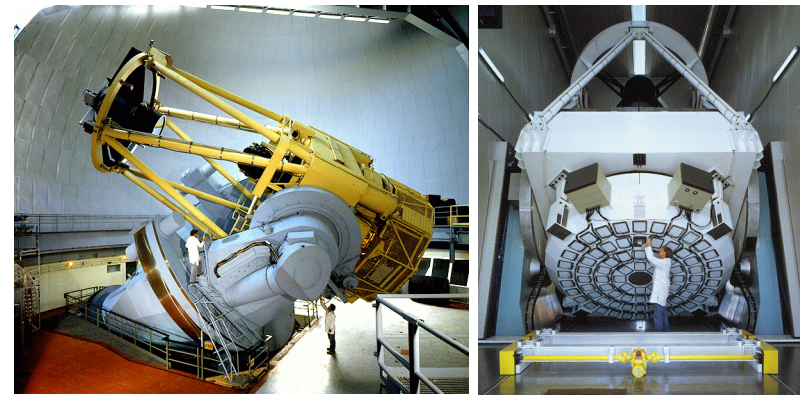
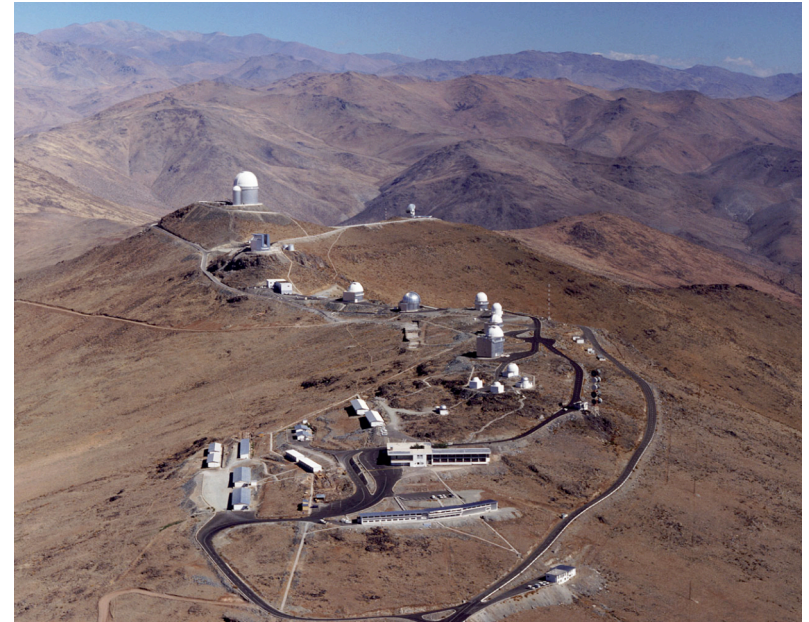
# La Silla

## ■ Medium-size telescopes

- 3.6m: HARPS for exo-planet searches
- 3.5m NTT: EFOSC2 & visitor instruments
- 2.2m in partnership with MPG and Brazil
- Paranal observing model 'retro-fitted' to La Silla

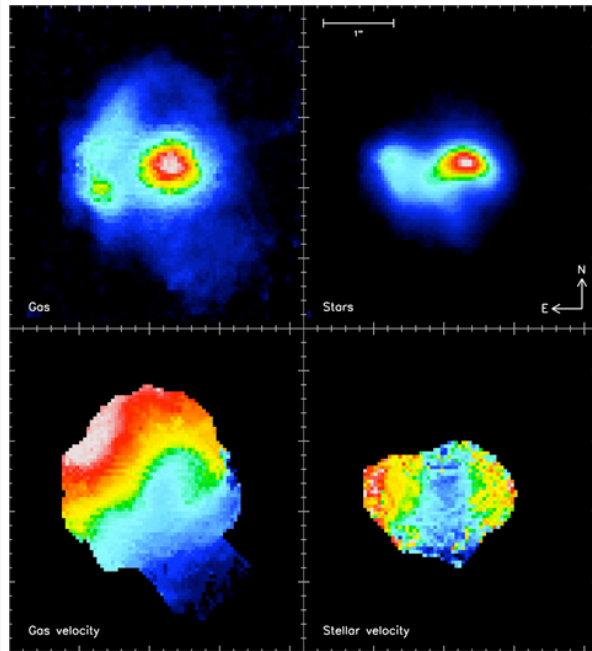
## ■ Small telescopes

- Closed/funded externally





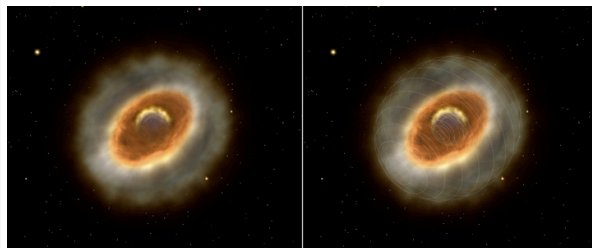
# Some Science Highlights



The Merging System Arp 220 (SINFONI-LGS/VLT)

ESO Press Photo 27c/07 (13 June 2007)

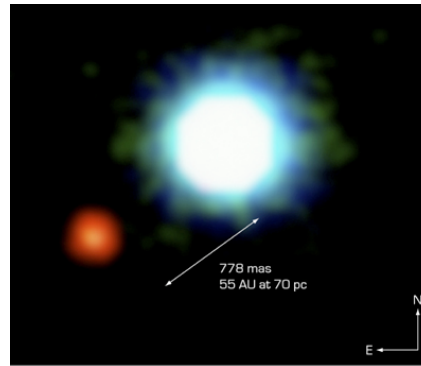
This image is copyright © ESO. It is released in connection with an ESO press release and may be used by the press on the condition that the source is clearly indicated in the caption.



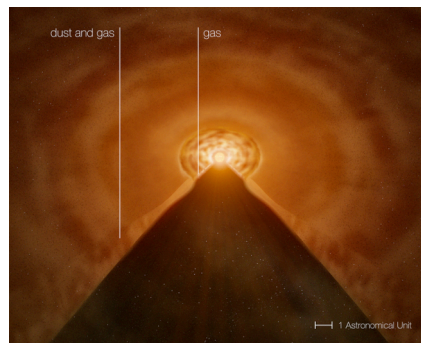
Inner Winds of Eta Carinae  
(Artist impression)

ESO Press Photo 06b/07 (21 February 2007)

This image is copyright © ESO. It is released in connection with an ESO press release and may be used by the press on the condition that the source is clearly indicated in the caption.



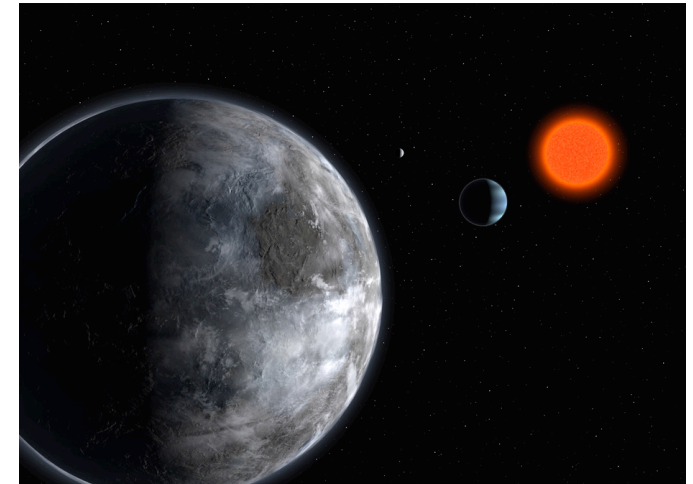
The Brown Dwarf 2M1207 and its Planetary Companion (VLT/NACO)



The disc around MWC 147  
(Artist Impression)

ESO Press Photo 03a/08 (29 January 2008)

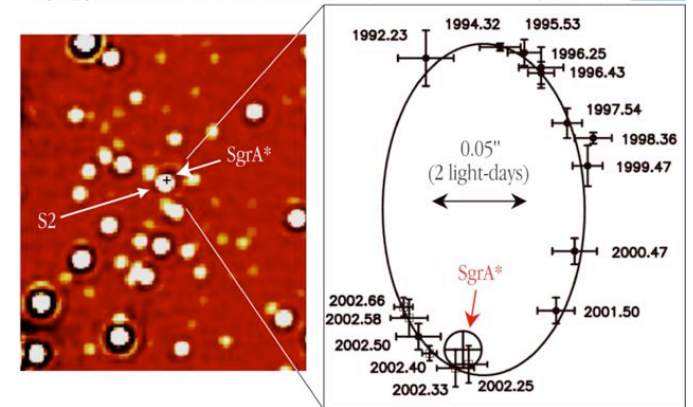
This image is copyright © ESO. It is released in connection with an ESO press release and may be used by the press on the condition that the source is clearly indicated in the caption.



The Planetary System in Gliese 581  
(Artist's Impression)

ESO Press Photo 22a/07 (25 April 2007)

This image is copyright © ESO. It is released in connection with an ESO press release and may be used by the press on the condition that the source is clearly indicated in the caption.



The Motion of a Star around the Central Black Hole in the Milky Way

ESO PR Photo 23c/02 (9 October 2002)

© European Southern Observatory





# Chajnantor

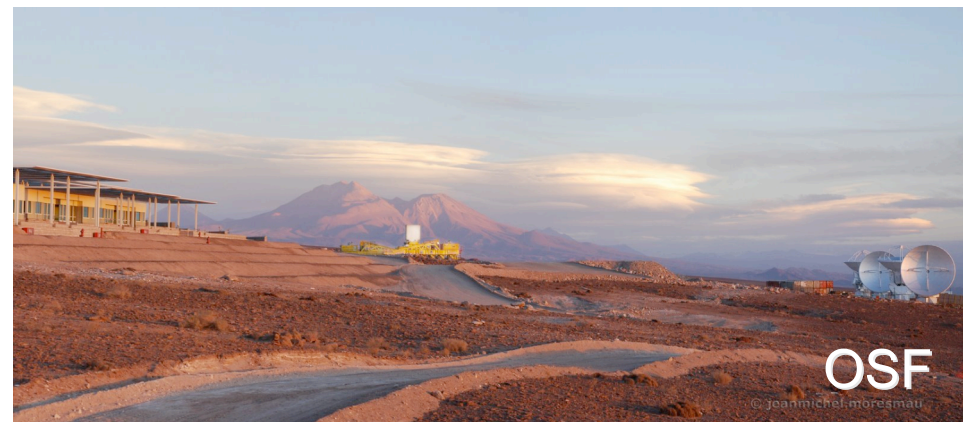
## ■ APEX

- 12m sub-millimeter antenna
- ESO, MPG and Sweden



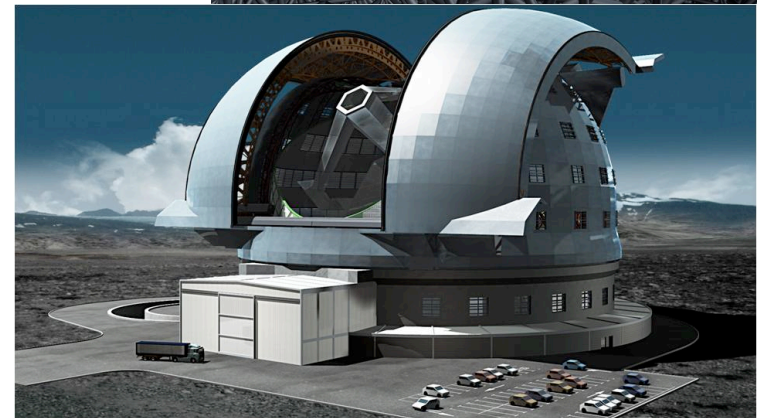
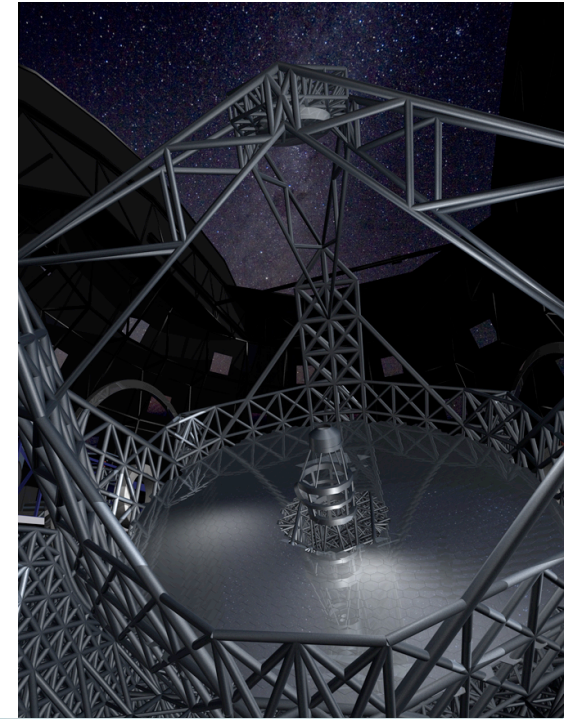
## ■ ALMA (2012)

- Transformational science
- 66 antenna array at 5050m
- Operations support at 2950m
- Global partnership with North America & East Asia



# Extremely Large Telescope

- Detailed design study
  - Baseline 42m primary mirror
  - Adaptive optics built-in
  - Fully funded (~62+ M€)
  - Site selection ongoing
  - Completion in early 2010
  
- Project
  - Builds on *entire* expertise at ESO *and* in member states
  - Construction 2011-2018
  - Synergy: JWST/ALMA



European Southern Observatory



# Balanced approach

- Optimize scientific harvest
  - Short, normal, large, ToO, GTO, Calibration
  - ~1000 proposals/semester (incl. APEX & DDT)
  - Over-subscription on VLT: factor 4-6
  
- Large programs
  - Provide key science results
  - In future, also consider very large programs:
    - Public surveys on VISTA and VST
    - 250 night GTO programs for 2<sup>nd</sup> generation instruments
    - Public surveys on UT's would be natural next step



# Proposal pressure

## ■ P82

- 925 proposals received (751 Paranal only)
- 21 Large, 598 Normal, 221 Short, 41 ToO, 41 GTO, 3 Calibration, 16 GTC

## ■ P83

- Numbers very similar

