



Astronomy, the GTC & dark skies

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Astronomy

- 400 years since Galileo pointed his telescope to the skies
 - He saw:
 - Dark spots on the Sun (imperfections!)
 - Phases in Venus (How comes if the Earth is the Centre?)
 - Mountains in the Moon (more imperfections!!!)
 - Satellites around Jupiter (How comes if the Earth is the Centre of the UNIVERSE!!!)
 - The ensuing story you all know...



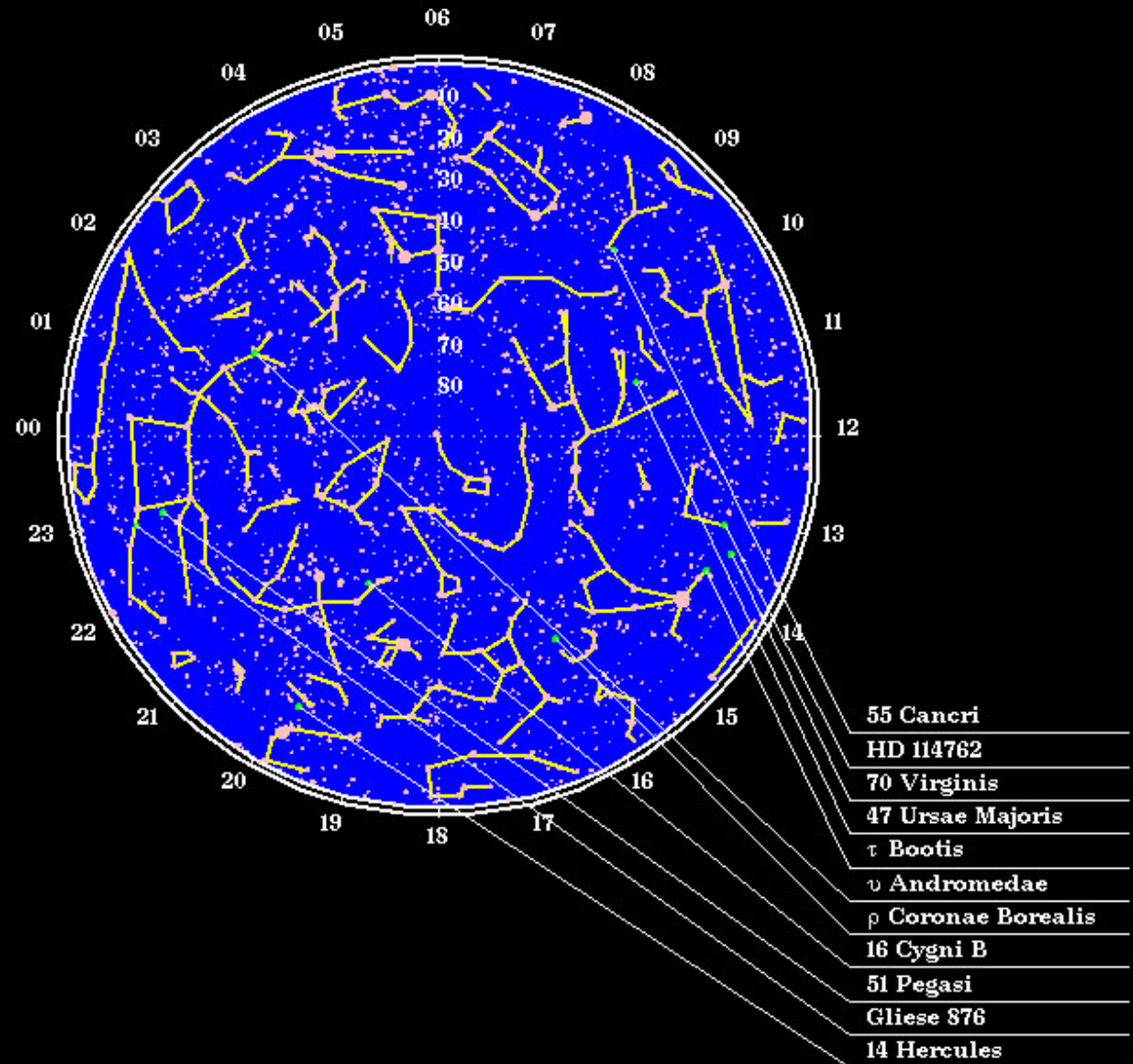
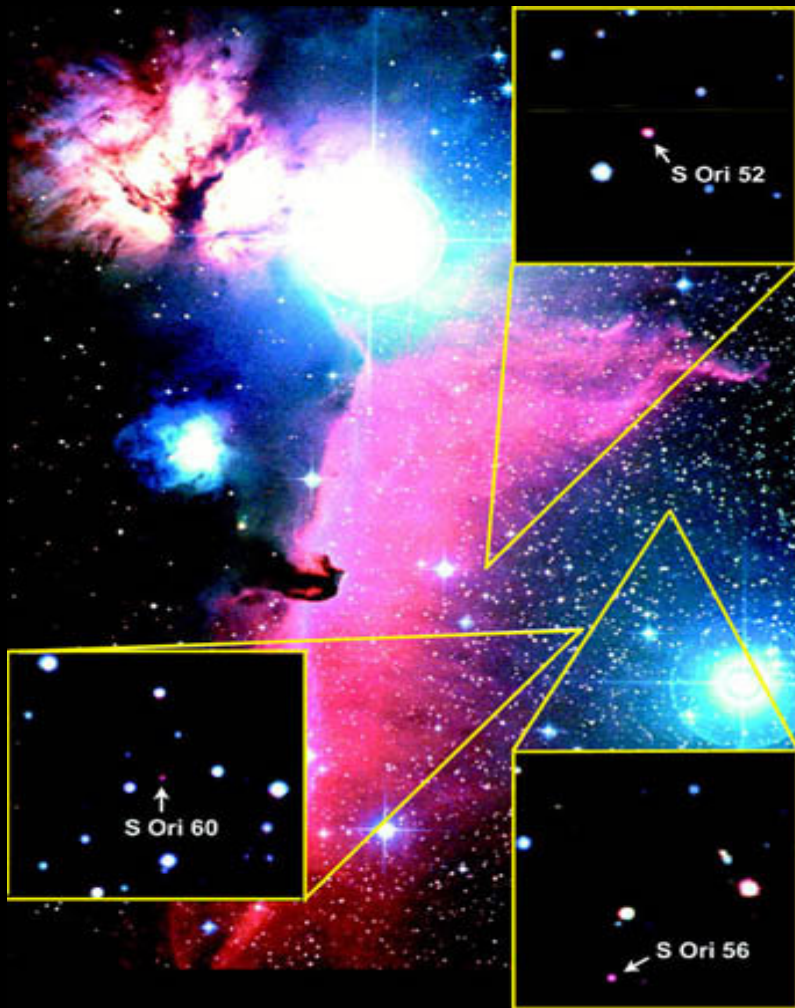
Astronomy today

- Celebrate the International Year of Astronomy
- Astronomy has developed enormously since Galileo
 - We understand:
 - The making of stars
 - How stars form, evolve and die
 - How the chemical elements are produced in the nuclei of stars
 - How galaxies are made and evolve in time to produce galaxies such as our own, such as Andromeda, etc.
 - We have detected:
 - Small asteroids, Trojans, & other small Solar system objects
 - Many planets around stars other than our Sun
 - Black Holes and distant Supernovae
 - Galaxies in their making, interacting, being cannibalised
 - The Echo from the Big Bang
 - The anisotropies that originated the structures we know today



Many extra-solar planets found so far

They are everywhere!





Stars are also forming throughout the Universe, as well as in our own Galaxy





Galaxy collisions & cannibalism

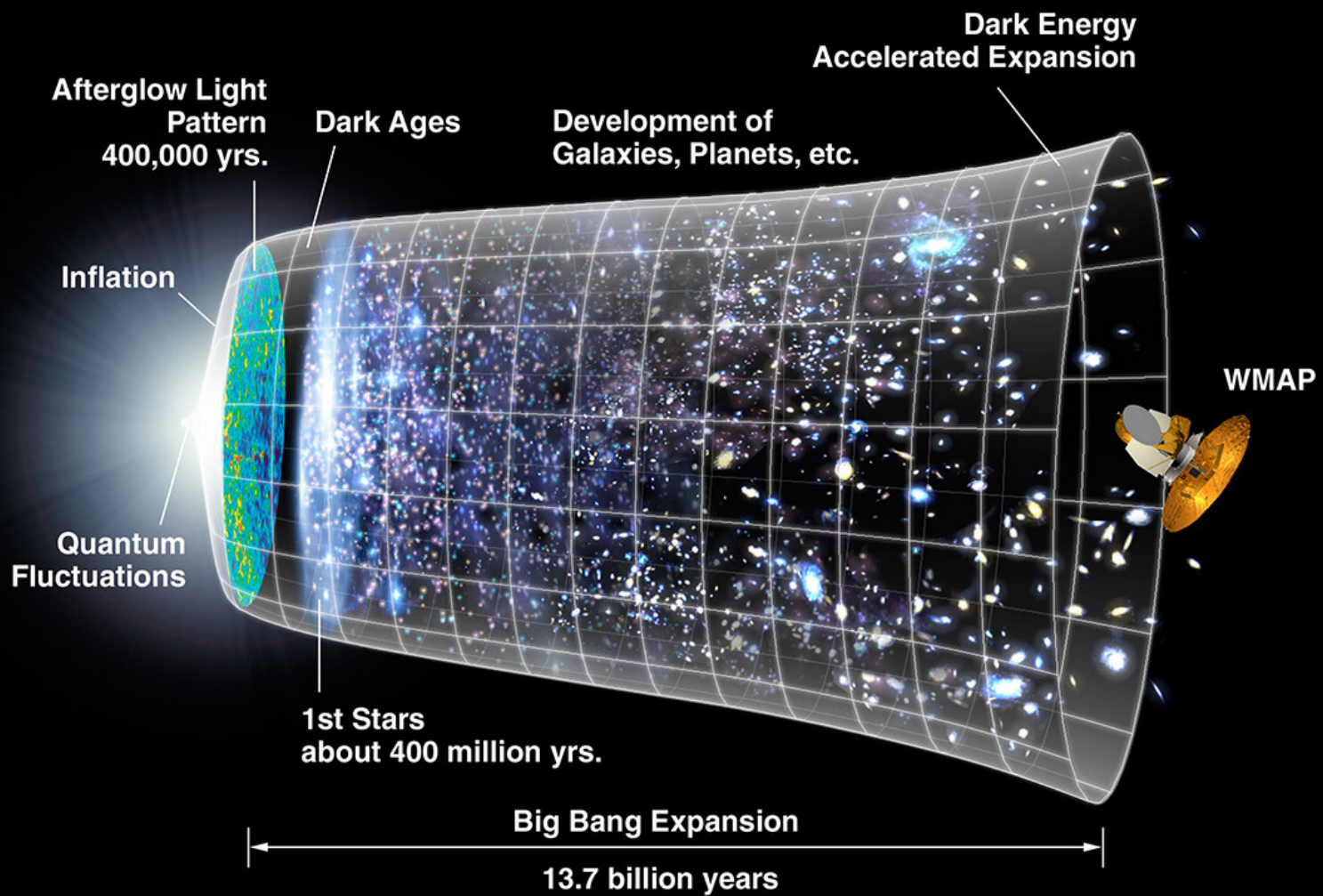
NGC 4038-4039 • Antennae Galaxies





Astronomy Today

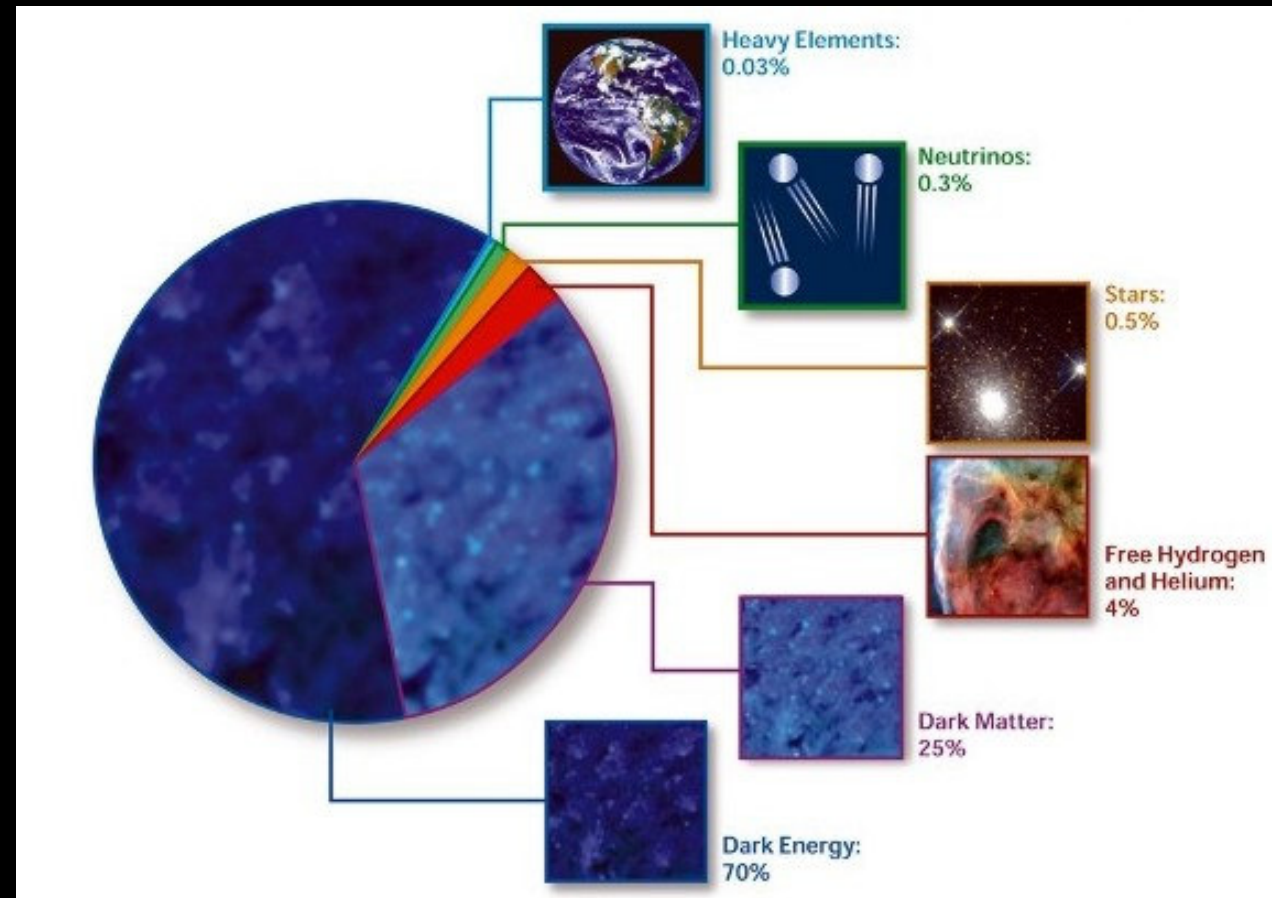
- We also know
 - The Universe is expanding
 - There is Dark Matter
 - Which we do not understand
 - There is Dark Energy
 - Which is totally out of touch as it is producing an acceleration of the expansion of the Universe





Astronomy Today

- The troublesome result is that
 - Both Dark Matter plus Dark Energy make up 95% of the energy content of the Universe
 - That leaves us with 5% of matter known



So that's plenty of work for astronomers!



The GTC

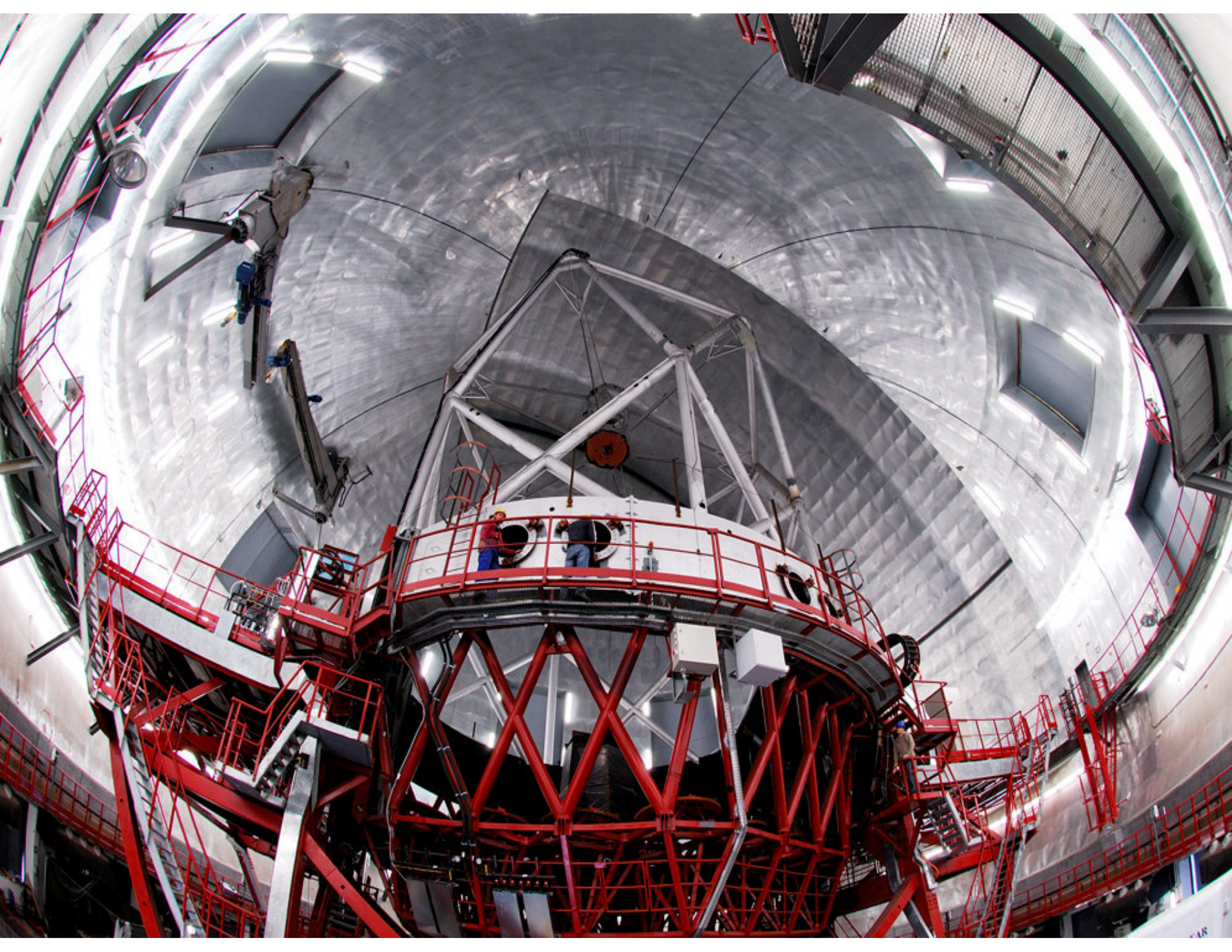
- The most advanced telescope of its class
- Just started science operation
- Built in Spain as a consortium between Spain, Mexico and the University of Florida
- Built at the Observatorio del Roque de los Muchachos, in the Spanish Island of La Palma
- Benefiting from the clear skies and excellent transparency of its atmosphere



COPUJO, viernes June 10, 2009



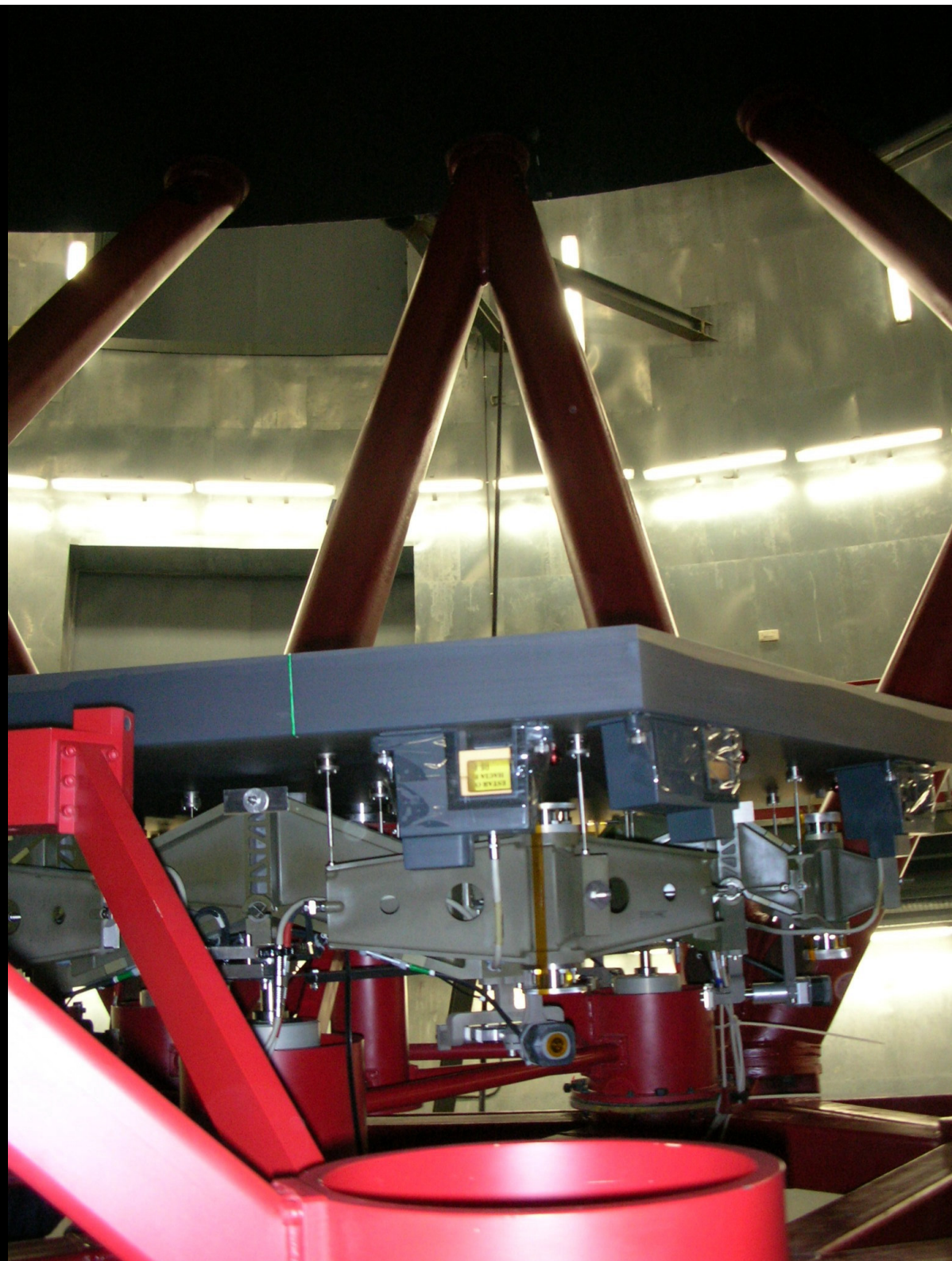
COPUOS, Vienna June 10, 2009

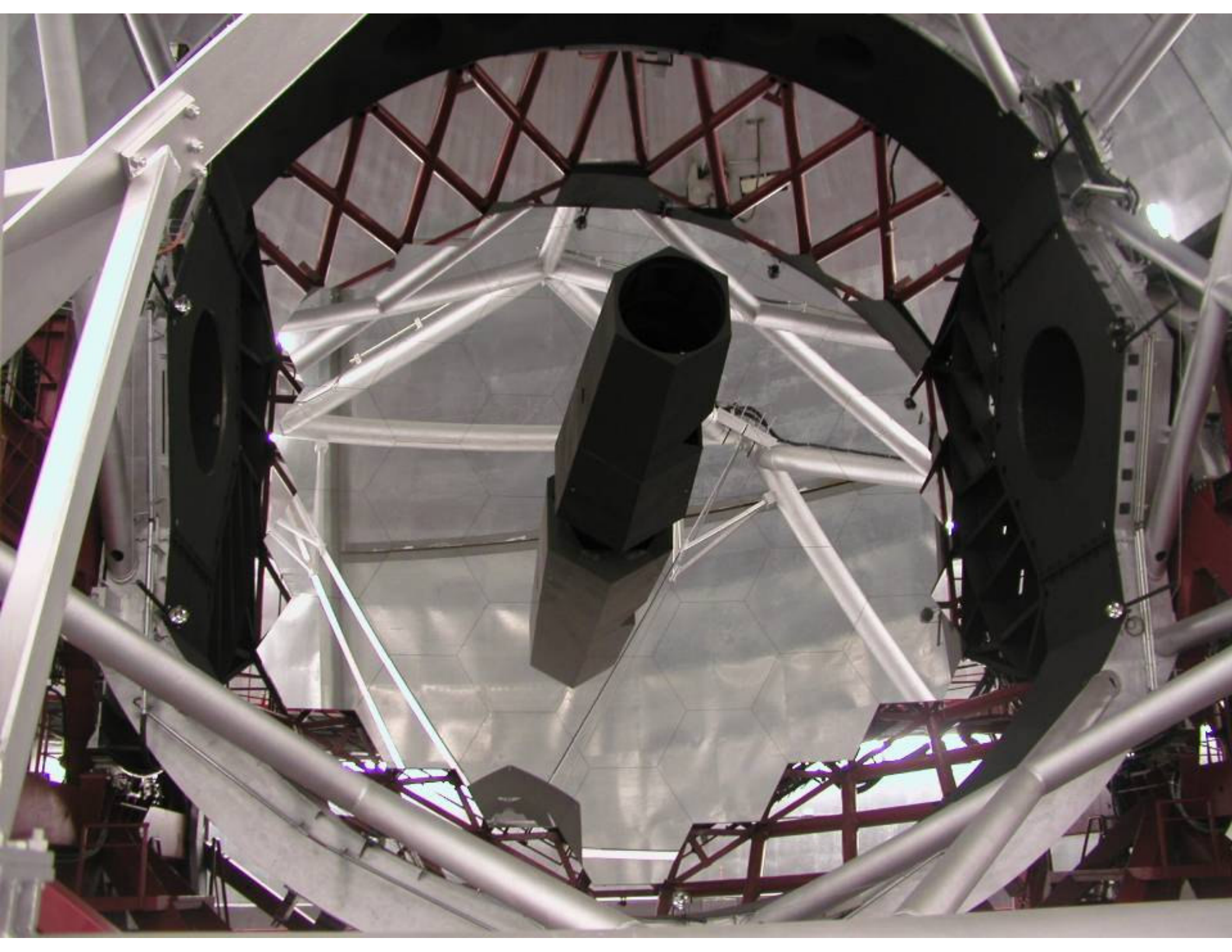


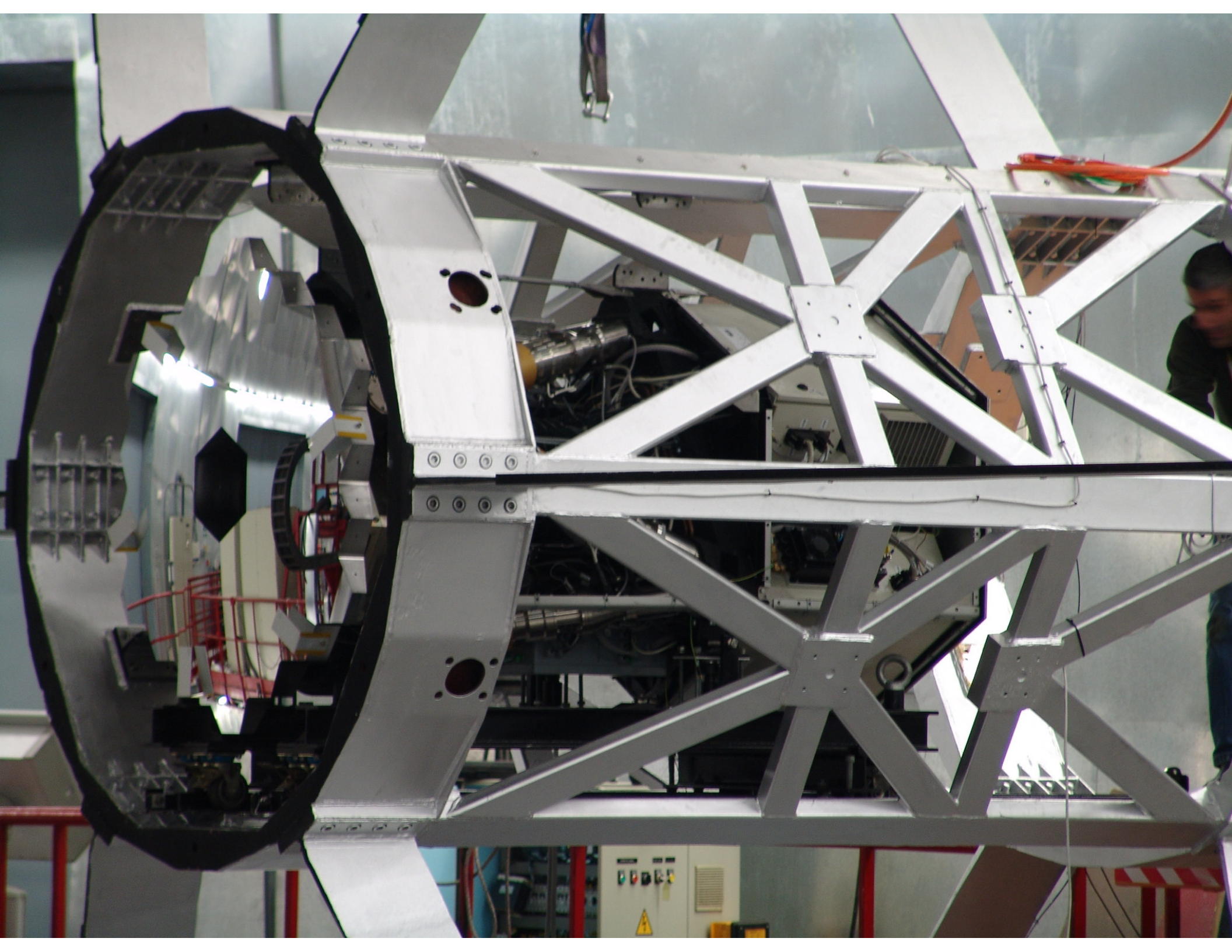


Lateral View of Segment

Note whiffletree & actuators for active corrections

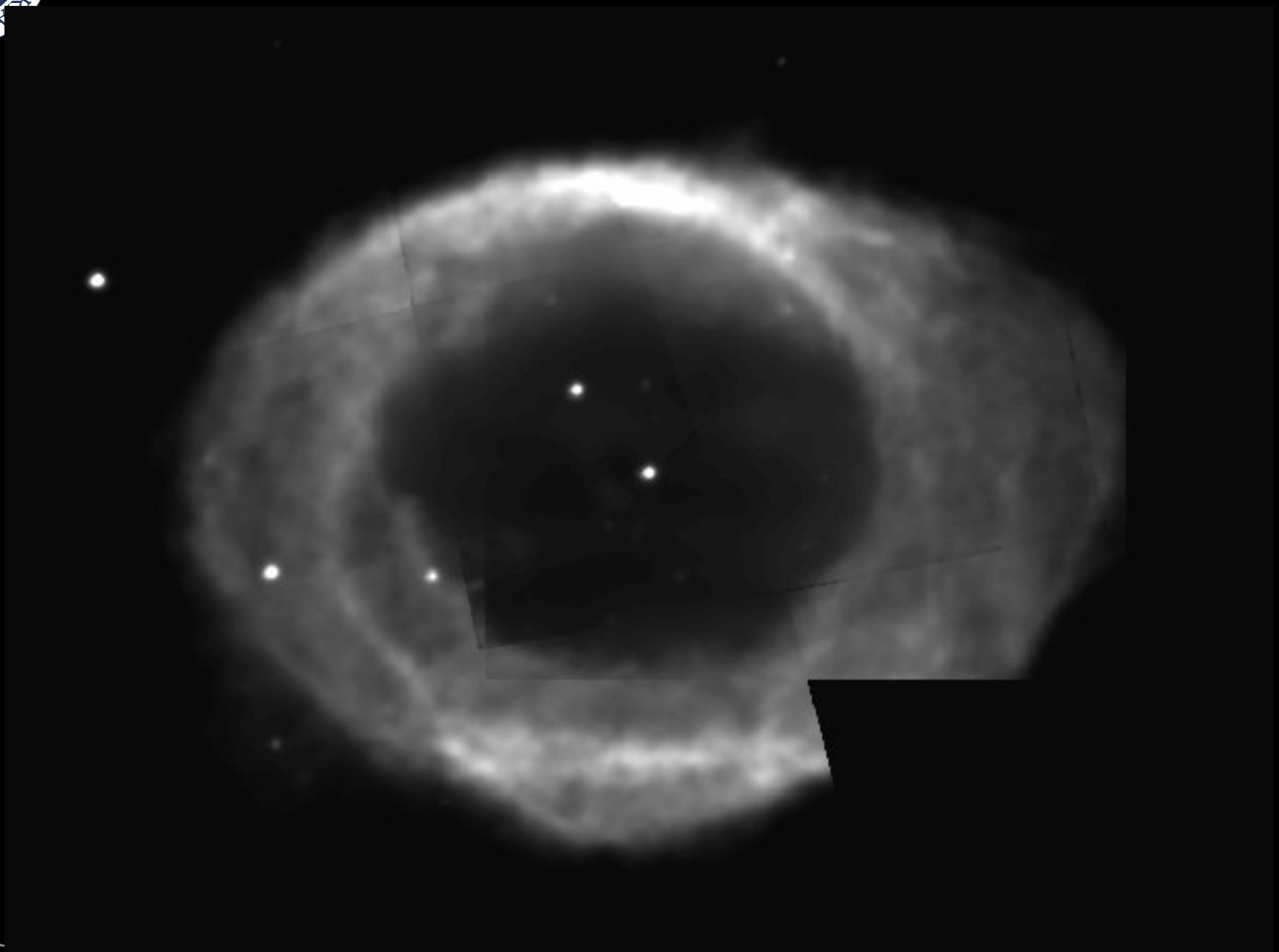


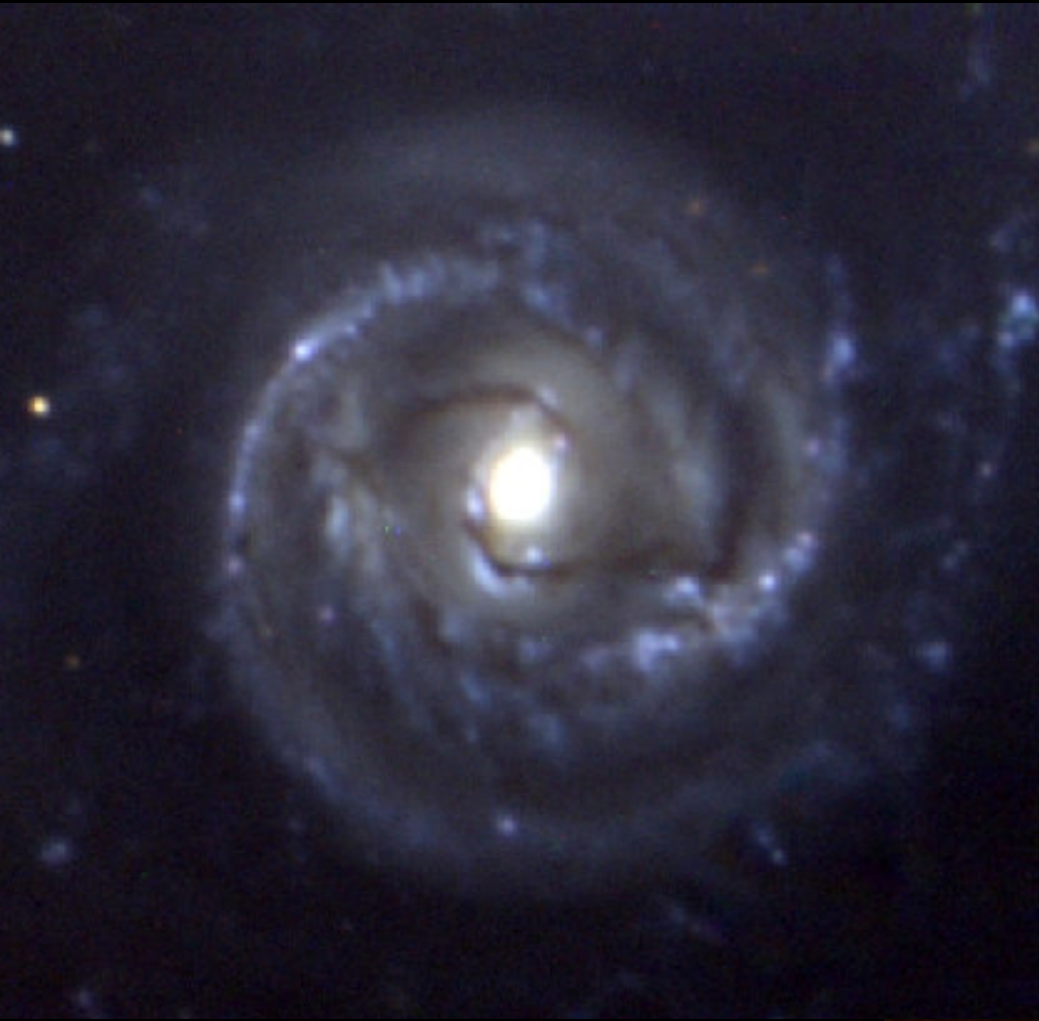


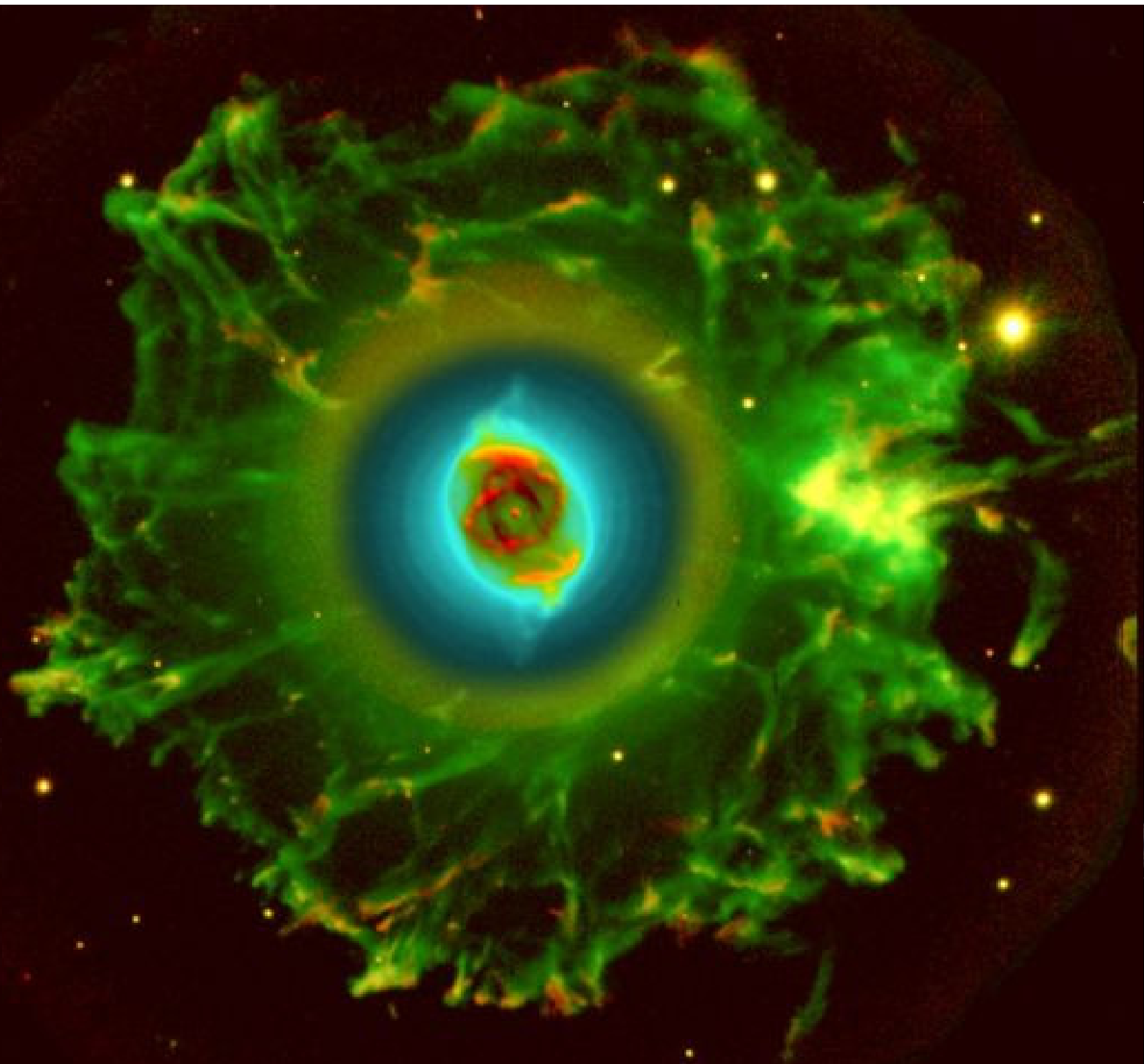




M 57: Mosaic









Astronomical Skies

- Must be dark
- Must be clean
- Must be preserved for the sake of public enjoyment!
- Must be preserved for the advance of Astronomy



The Earth at night!





More information

- www.iac.es
- www.gtc.iac.es

Thank you!

