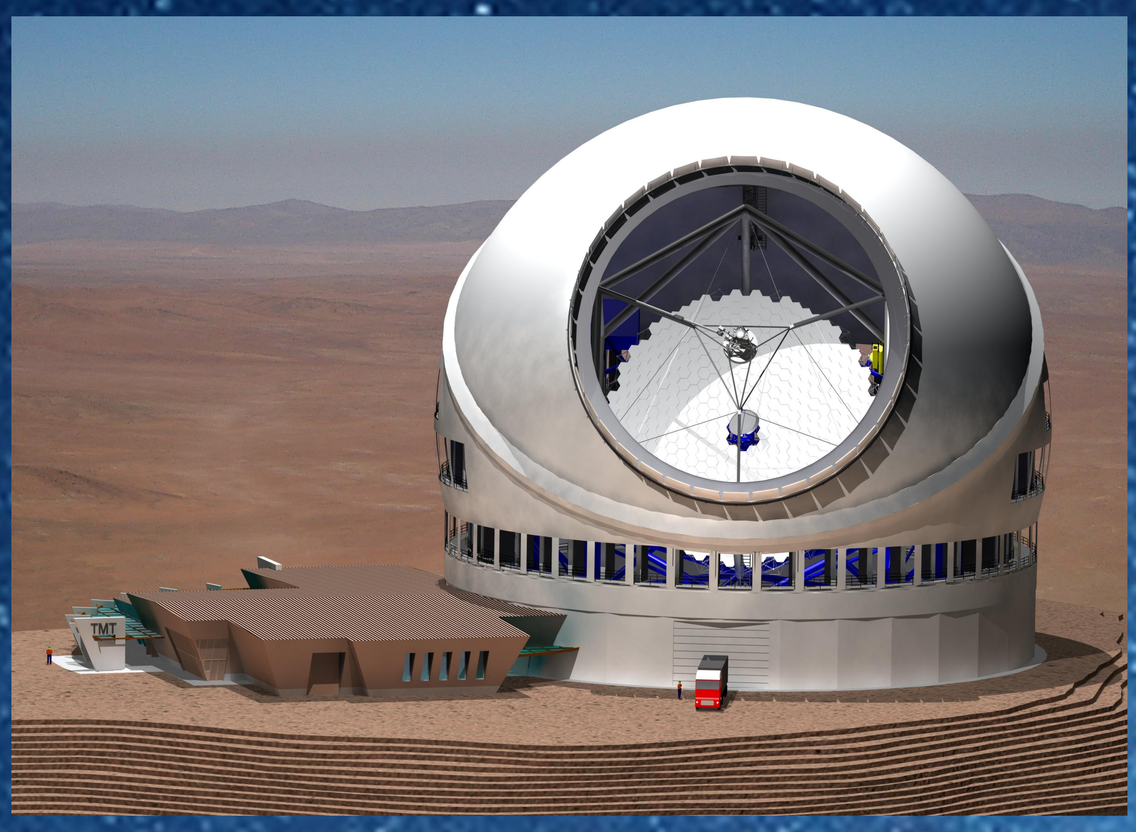
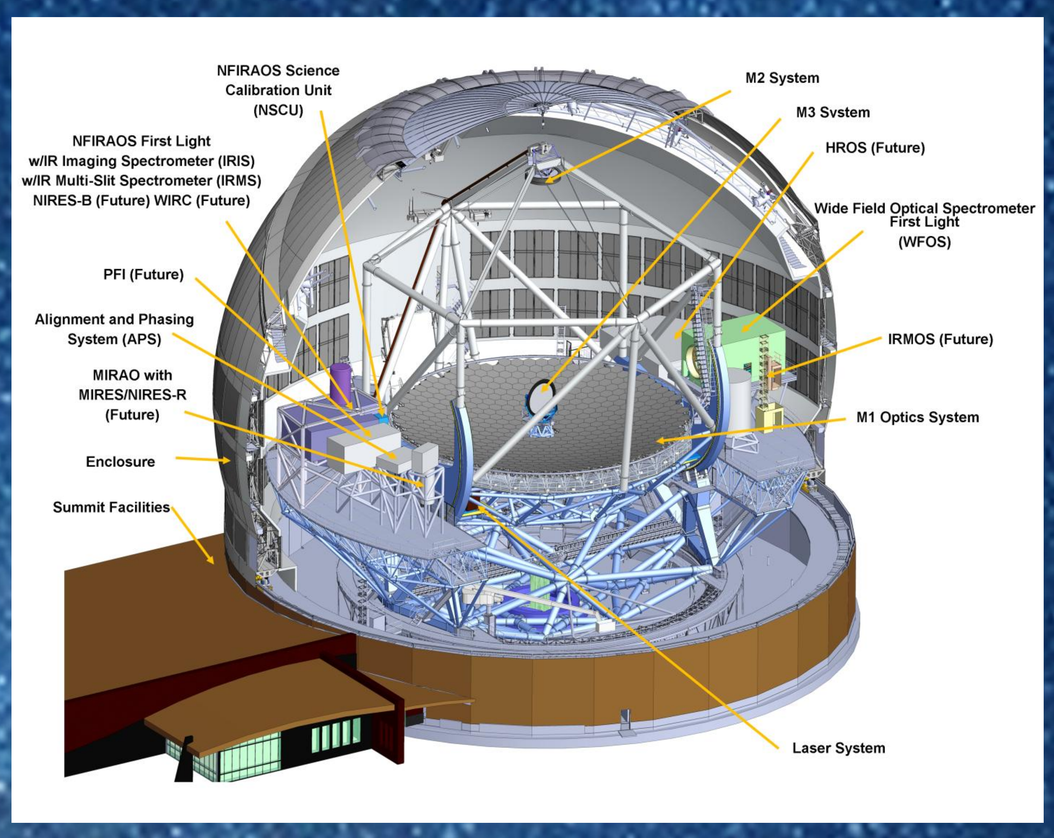
# THIRTY METER TELESCOPE

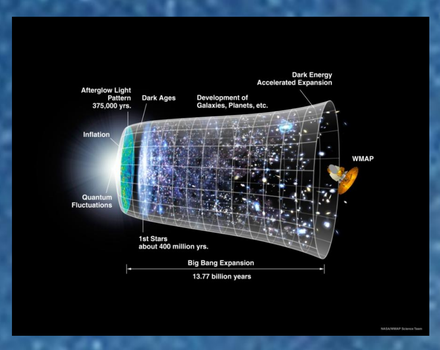
TMT, with its 30-meter (nearly 100-foot) diameter mirror, will have nine times the light-gathering power of today's best telescopes. When compared to the Hubble Space Telescope, TMT will have 156 times the collecting area and more than 10 times its resolution at certain wavelengths. TMT will use a segmented primary mirror, which was successfully pioneered on the Keck telescopes.

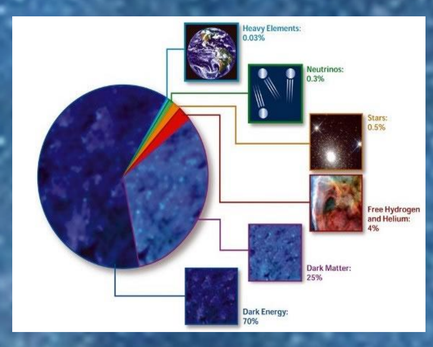



In the coming decades, TMT will explore the great mysteries of the Universe: black holes at the centre of galaxies, assembly of the first galaxies and their evolution, birth and death of stars, and planets around distant stars. However, the most intriguing may be the questions we cannot foresee. It is by probing the unknown that TMT will reach its full potential, taking astronomers and the public on new journeys of exploration.

The Thirty Meter Telescope (TMT) will be the world's most advanced ground-based observatory (expected to be completed by 2024) that will operate in optical and mid-infrared wavelengths. It will be equipped with the latest innovations in precision control, phased array of mirror segments and laser guide star assisted adaptive optics system.

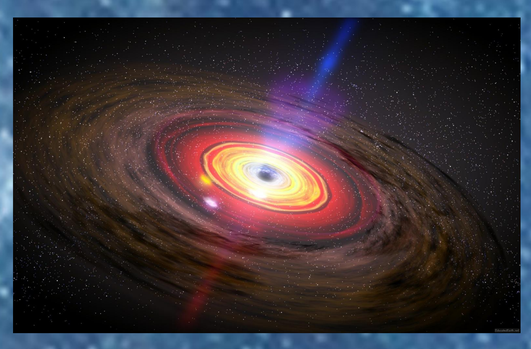



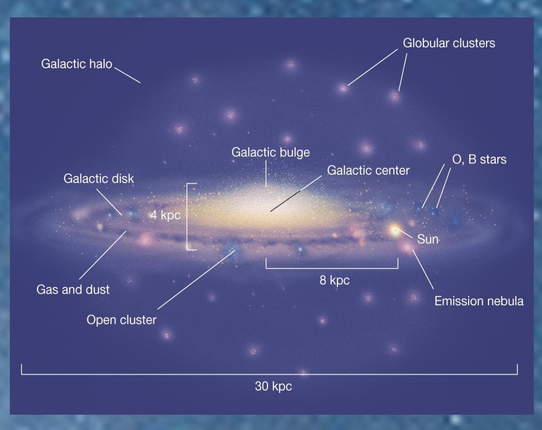



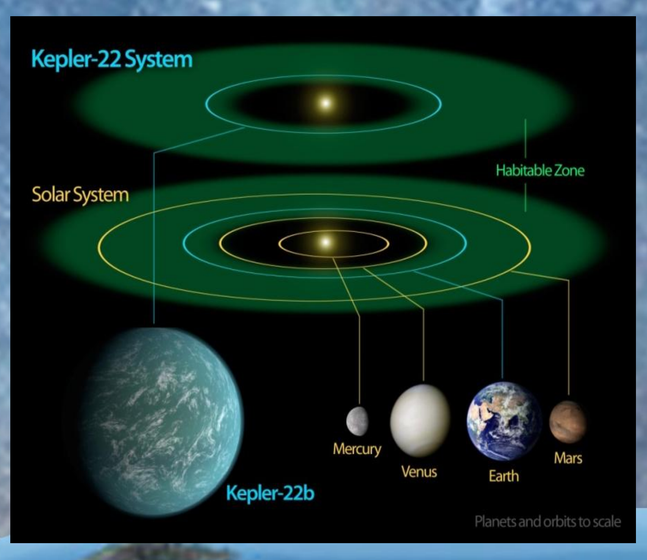

- **Ritchey-Chrétien optical design**
- **30m hyperboloidal f/1 primary mirror with 492 hexagonal segments, each 1.44 m in size**
- **3.1m convex hyperboloidal secondary mirror**
- **Flat 2.5m x 3.5m tertiary mirror**
- **f/15 final focal ratio**
- **20 arcmin field of view**
- **TMT will have a suite of instruments for imaging and spectroscopy in the wavelength range 0.32um to 2.5 um.**

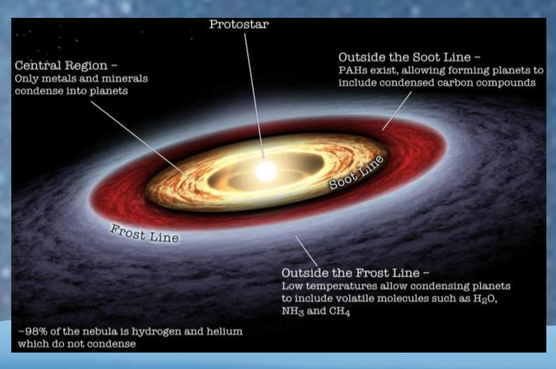
**Science Cases:**

- **Birth of the First Stars and the Formation of the Earliest Galaxies**
- **Nature and Composition of the Universe**
- **Relationship between Black Holes and Galaxies**
- **Study of the Milky Way**
- **Formation of Stars and Planets**
- **Extra Solar Planets and Search for Life in the Universe**
- **Our Solar System**



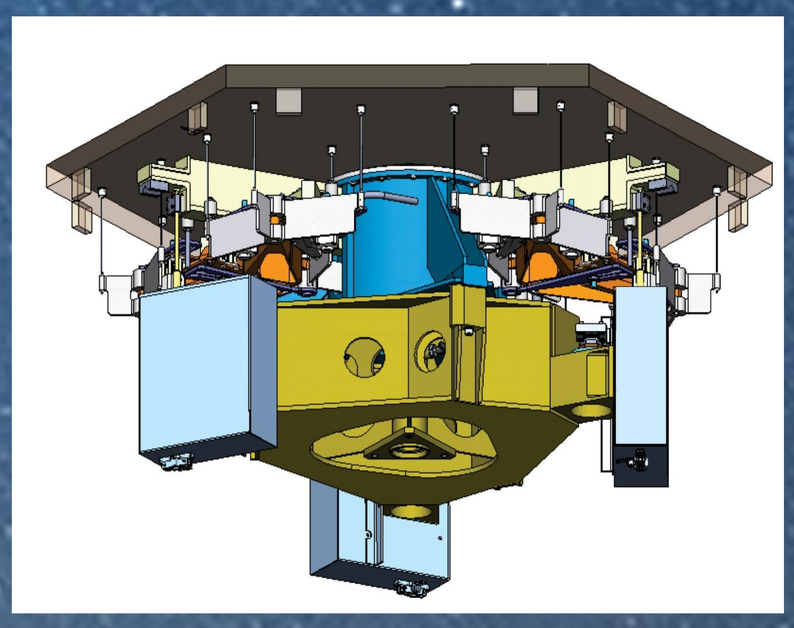



**India's Role:**

**The complete segment support system consisting of 1476 actuators and 2772 edge sensors, a portion of the 492 segments, 492 SSA's and a major part of the observatory control software are part of India's contribution.**



**Thirty Meter Telescope (TMT) is an international project involving India, USA, Canada, Japan and China.**

TMT will be located at **Mauna Kea in Hawaii** at an elevation of 4050 m.

**India TMT Coordination Center (ITCC) :**

The Aryabhatta Research Institute for Observational Sciences (ARIES), Nainital; the Indian Institute of Astrophysics (IIA), Bangalore; and the Inter-University Center for Astronomy and Astrophysics (IUCAA), Pune; are the three main institutes constituting India-TMT. The activities of India-TMT are coordinated by the India TMT Coordination Center (ITCC) located at IIA.

http://tmt.iiap.res.in/

http://www.iiap.res.in/iiaoutreach