Thirty Meter Telescope(TMT)

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In news

Some of the Indian astronomers collaborated with Nobel laureate on Thirty Meter Telescope project

What is the Thirty meter telescope project?

- It is an **international partnership between CalTech, Universities of California, Canada, Japan, China, and India**
- With its **30 m prime mirror diameter,** TMT will be three times as wide, with nine times more area, than the largest currently existing visible-light telescope in the world
- A large diameter telescope **provides two new basic capabilities that are not available with existing ground based telescopes** and that cannot be delivered by the small telescopes in space or planned for the future they are:
    1. **Improved spatial resolution,** as long as the distorting effects of the Earth's atmosphere are corrected for with an adaptive optics system; and
    2. **Increased sensitivity**

- TMT images are more than 12 times sharper than those from the Hubble Space Telescope.
- The TMT is **one of the new class of telescopes called Extremely Large Telescopes (ELT)**.
- Currently, the largest telescope mirror in the world belongs to the Gran Telescopio Canarias (GTC). But a new class of telescopes using segmented mirrors are breaking new ground in mirror sizes.
- **The TMT will have a 30 meter primary mirror in 492 segments, making it much more powerful than the GTC.**

- The **Telescope is designed and developed by the TMT International Observatory LLC (TIO).**
- The TIO is a non-profit international partnership between the California Institute of Technology, the University of California, the National Institutes of Natural Sciences of Japan, the National Astronomical Observatories of the Chinese Academy of Sciences, the Department of Science and Technology of India, and the National Research Council (Canada).
- **Maunakea was selected as a site**
- **Areas explored under TMT include:**
    - DARK MATTER AND DARK ENERGY:
    - The Evolution of the Structures in the Universe
    - Supermassive Black Holes In Galaxies
    - Their Birth and Their Relationship With Galaxies:
    - The Formation of Stars and Planets
    - The Characteristics of Exoplanets and Whether There Is Life Elsewhere in the Universe
- TMT seeks to advance scientific knowledge while fostering connection among the partner countries and their citizens, and is expected to provide facilities with even greater capabilities to gather the observations needed to answer new and emerging questions in astronomy and physics in general.