



# TMT

## The Thirty Meter Telescope

The TMT represents a new paradigm in astronomical telescopes that will enable investigation of science's major mysteries, such as dark matter and dark energy, the ultimate fate of the Universe, the existence of life on other planets, and the nature of black holes. Using transformational new technology, much of which is Canadian, we will see further than any present facility, in ten times greater detail than the Hubble Space Telescope. This leap in capability will guarantee other new discoveries that will change human thinking forever. A marvel of engineering, TMT will set new standards for future generations of telescopes, and serve Canadian astronomers and its other partner communities as a flagship research facility.

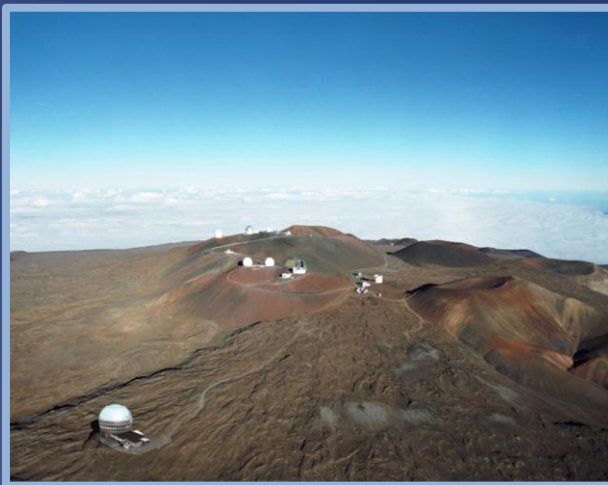


TMT Observatory in its iconic Canadian-designed enclosure

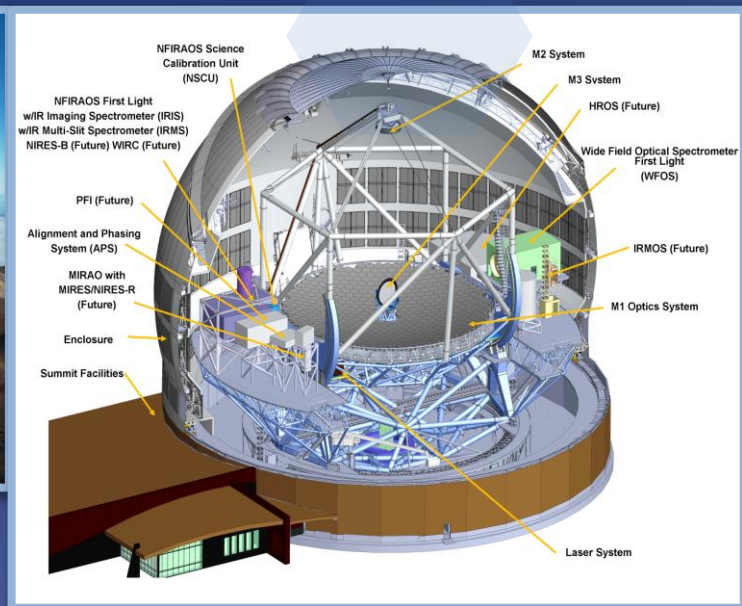
### Quick Facts on TMT:

- TMT project is an international collaboration, involving a powerful and forward looking research partnership between Canada, the USA, Japan, China, and India. See [www.tmt.org](http://www.tmt.org).
- TMT will be built on the summit of Mauna Kea in Hawaii, at an elevation of 4200 metres. Construction will begin in 2014, with completion early in the next decade.
- TMT's primary mirror is 30 metres across, giving it a light gathering ability 10 times greater than the largest of the existing optical telescope facilities. The mirror consists of 492 - 1.5 metre mirror segments, each 45 mm thick, positioned to a few millionths of a millimetre.

- Thanks to Adaptive Optics, a unique Canadian contribution, TMT's vision will be 10 times sharper than the Hubble Space Telescope.
- TMT is a technical, industrial and scientific endeavor that will establish Canada as a leader in technology and research. The Canadian contributions, including the TMT Enclosure and Adaptive Optics system, are essential to start the construction phase, scheduled for 2014.
- The planned Canadian contributions during the construction phase are vital to the project, totaling \$300 M or approximately 20% of the project. The technical innovations have wide applications outside of the TMT project. To date Canada has invested over \$30 M in TMT.
- TMT provides key synergies with world class astronomical observatories with vested Canadian interests, including the James Webb Space Telescope and the Atacama Large Millimeter Array (ALMA).
- TMT has a well-developed project management system for costs, schedule, and risk.



Artist's depiction of TMT on Mauna Kea, Hawaii



TMT Observatory Components

## The Opportunity

TMT is the highest priority in the 2010 Long Range Plan for Canadian Astronomy. Since the project inception in 2004, Canada has played a central role in defining its science goals and technical design, and as an equal share partner, the entire Canadian community now stand to reap the benefits of this decade long investment. The nature of the TMT partnership will provide stronger international linkages for Canada within the Pacific Rim trading group. The technical challenges of TMT will develop new globally competitive technical capabilities within Canadian industry. With the development of TMT, Canadians will embark on a transformational voyage of exploration that is certain to provide fundamental insight into our Universe and the life within it.

Within Canada, TMT is managed by ACURA in consultation with the National Research Council (NRC).

See the TMT Canadian Project Digest and contact information at <http://www.casca.ca/projects.php>.