The Thirty Meter Telescope

The Thirty Meter Telescope will revolutionize our understanding of the universe by addressing some of the deepest mysteries in modern science: the nature of dark matter, dark energy, and black holes; the ultimate fate of the Universe, and the existence of life on other planets. Using modern, cutting-edge technologies, many of which developed in Canada, TMT will be a hundred times more powerful than any existing space- or ground-based telescope. A marvel of engineering, TMT will not only transform Canadian science, but also Canadian industry. It will set new standards for future generations of telescopes, and serve Canadian scientists as one of the world's foremost research facilities.

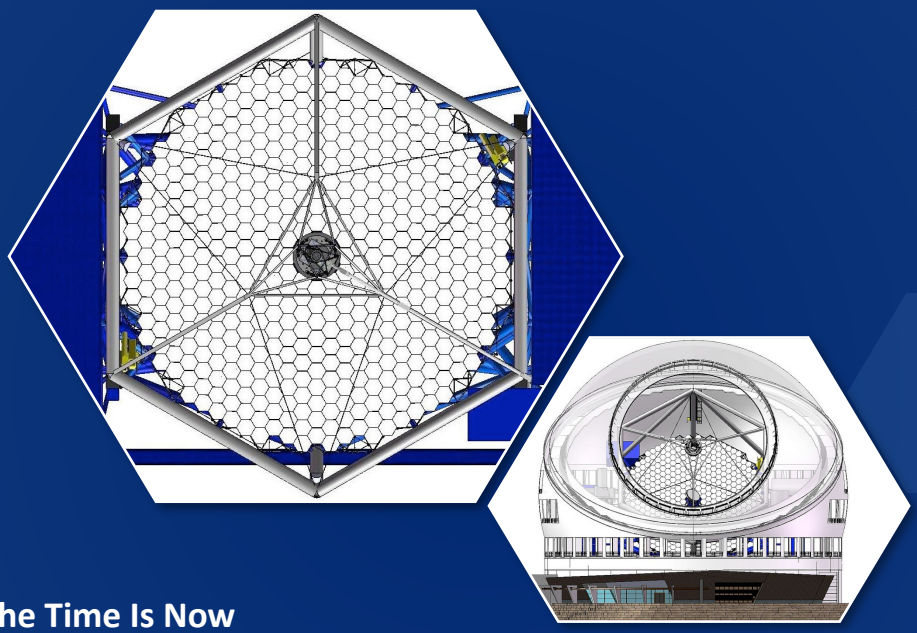
TMT at a Glance:

- TMT will be built on the summit of Maunakea on the Island of Hawaii, at an elevation of 4050 metres.
- The groundbreaking ceremony will take place in the fall of 2014. The telescope will be completed and operational in the spring of 2024.
- Thanks to a primary mirror 30 metres across, TMT will have 10 times the light gathering power of today's largest optical telescopes. With this extraordinary gain, TMT will be able to see fainter and farther than has ever been possible.

- TMT's primary mirror will be composed of 492 closely spaced hexagonal segments, each 1.44 metre across and 45 mm thick. A total of 1476 actuators and 2772 sensors will control the overall shape of the primary mirror to just a few millionths of a millimetre.
- TMT's Adaptive Optics Instrument, a critical component designed and built in Canada, will produce images of dazzling clarity – 10 times sharper than those of the Hubble Space Telescope.
- TMT's enclosure features an innovative and ingenious Canadian design: its circular aperture and spherical shape preserve the exceptional image quality of the telescope while minimizing costs.

Canada and the TMT International Observatory:

- The TMT partnership started in 2003 as a joint venture between the Association of Canadian Universities for Research in Astronomy (ACURA), the California Institute of Technology, and the University of California. Today, the partnership has extended to include Japan, China, and India. Canada has already invested more than $30M in the design and development of TMT.
- Canada is poised to provide two critical TMT components: the telescope enclosure and its adaptive optics system. These components, requiring an investment of $300M between 2015 and 2024, represent roughly 19% of the total project cost.
- In April 2014, Japan, China and a consortium of U.S. Universities committed funds towards construction of TMT; India will join in the fall. To remain in the partnership, Canada must commit by 2015.



The Time Is Now

In 2010, TMT was identified as the highest priority for Canadian astronomy. Since the project's inception in 2003, Canada has played a leading role in defining TMT's science goals and technical design; as a result, the entire Canadian community now stands to reap the rewards of this decade-long investment. The engineering challenges presented by TMT have already seeded new, globally competitive technical capabilities in Canadian industry, and with continued participation in the project, Canadians will embark on a remarkable voyage of discovery that is certain to provide profound insights into the universe and our place within it. For this exciting vision to become a reality, Canada needs to join the U.S., Japan, China and India in committing the resources to construct this marvel of scientific engineering. The time to invest in the future is now.

In Canada, TMT is managed by the Association of Canadian Universities (ACURA) in consultation with the National Research Council (NRC). For further information, see http://www.tmt.org