



FACT SHEET

- DESCRIPTION:** The Thirty Meter Telescope (TMT) is a non-profit collaboration between the University of California, the California Institute of Technology, the National Astronomical Observatories of the Chinese Academy of Sciences, National Institutes of Natural Sciences (NINS) in Japan and the countries of Canada and India. Once built, TMT will be one of the world's most advanced optical-infrared telescopes.
- TMT will look more deeply and precisely into the night sky than ever before in order to help answer some of humanity's biggest questions about the universe. In addition to its 30m diameter mirror, TMT will incorporate the latest technology to compensate for the blurring effect of the Earth's atmosphere. Not only will TMT take between 3 to 5 times sharper images than current telescopes on Earth, but it will be 12.5 times sharper than the Hubble Space Telescope and more than four times sharper than the James Webb Space Telescope.
- LOCATION:** Maunakea on Hawai'i Island is the preferred site for TMT.
- CULTURE:** TMT's goal is to become a community-based observatory whose policies and actions are informed by input from the Hawai'i community and whose priorities demonstrate deep respect for the cultural significance of Maunakea, and care for the people of Hawai'i. Among the site-related cultural considerations:
- o TMT's preferred site is located 500 feet below the true summit of Maunakea, the most culturally significant point on the mauna (mountain).
 - o TMT will not be visible from culturally sensitive locations, such as the summit of Kukahau'ula, Lake Waiau, and Pu'u Lilinoe.
 - o The TMT site is located a distance from recognized customary and traditional cultural practice areas. For example, it is located 1.42 miles away from Lake Waiau and .91 miles from Pu'u Pohaku. The closest site is .78 miles away.
 - o Once built, TMT will not interfere with views of the sunrise, sunset, or shadow of Maunakea views of which are sometimes used in traditional and customary native Hawaiian practices.
 - o All TMT employees, contractors and sub-contractors will participate in a Cultural and Natural Resources Training Program annually, to gain an understanding and respect for cultural and religious practices.
- ENVIRONMENT:** TMT is committed to a model of sustainable astronomy that will minimize its impact before, during and after construction. Among the site-related environmental measures in place:
- o TMT will use a total closed wastewater system. All waste will be collected and removed from the facility on a regular basis and will be trucked to sea-level using a commercial waste removal service for proper disposal..

- o Comprehensive research by expert, independent hydrologists have confirmed that TMT will pose no danger to the water resources and hydrology of Maunakea.
- o No mercury will be used by or at the Observatory.
- o TMT's fuel storage area and piping will be double-walled and equipped with leak monitors.
- o TMT's dome enclosure was redesigned with a shorter height and focal ratio to allow for the smallest dome possible. The dome is designed to fit very tightly around the telescope, with just enough space to fit a person for maintenance.

- o TMT is sited on a lava plain 500 feet below the summit, and specifically chosen to minimize its environmental impact. It is only visible from 14% of Hawai'i Island. A special aluminum-like coating reflects the sky and reduces the visibility of the structure.
- o The project's facilities will incorporate solar hot water systems, solar panels, energy-saving power and communication devices and will conduct an annual audit designed to further reduce energy use.

SCIENCE:

Today's cutting-edge telescopes are making startling discoveries about new planets, the building blocks of today's massive galaxies in ancient time, and the incredibly powerful death throes of supermassive stars at the edge of the observable Universe. To maintain this exciting pace of discovery, astronomers and engineers are pushing the boundaries of today's technology while simultaneously creating the innovations that will make TMT the most advanced and capable telescope on Earth.

Astronomers will be able to see further into our universe and reach back toward the very beginning of time. In the nearby universe, they will be able to discover and characterize, in detail, planets orbiting stars other than the Sun. There is the potential to examine these planets for signs of life beyond the Earth: this would be one of the most important discoveries of all time.

OUTREACH & EDUCATION:

Under new direction in Hilo, Hawai'i, TMT staff are building the relationships and trust necessary for supporting Hawai'i's various communities through grassroots communications and community-driven educational programs. Through partnerships and collaborations with Hawai'i community leaders, schools, and non-profit organizations, they are focused on meeting the island's communities' needs with innovative programming in education, infrastructure and mālama 'āina (honoring the land).

Inspiring the next generation of explorers, TMT staff participate in a variety of educational programs across Hawai'i, on the United States Continent and in its partner countries that are designed to engage students in interactive science and engineering lessons, exciting discoveries about the universe, and understanding the value in various ways of knowing 'A'ohe pau ka 'ike i ka hālau ho'okahi (All knowledge is not taught in the same school).

While supporting hands-on learning in various venues, TMT staff are also dedicated to academic achievement for all students and have started tutoring programs at various Hawai'i Island schools.

In addition, TMT's Hilo staff are committed to listening to and learning from communities in Hawai'i, particularly Native Hawaiian communities, with a focus on building long-term partnerships based on respect and trust.

Past community outreach efforts have included pandemic relief and a focus on education. TMT launched The Hawaii Island New Knowledge (THINK) Fund in 2014 to better prepare Hawaii Island students for careers in STEM. To date, TMT has funded more than \$5.5 million for Hawaii Island students, their families and teachers. TMT also initiated a Workforce Pipeline Program, funding summer internships, STEM camps, Robotics, community events and other programs to help Hawaii Island students achieve success at becoming lifelong learners.

LEASE RENT: Based on its agreement with the University of Hawai'i, TIO began making payments on its sublease rent in 2014. Beginning in 2025, TMT will pay \$1 million in annual lease rent; 80 percent will go to the stewardship of the mountain and 20 percent will go to the Office of Hawaiian Affairs.

PARTNERS: California Institute of Technology
National Astronomical Observatories of the Chinese Academy of Sciences
Department of Science and Technology of India
National Institutes of Natural Sciences of Japan
National Research Council (Canada)
University of California

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INFO: <http://tmt.org/>

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