



The Facts About TMT on Maunakea

Cultural

What is TMT doing to protect Maunakea's cultural resources?

TMT, in cooperation with the community and other observatories, is committed to becoming a model observatory that demonstrates deep respect for the cultural and historical significance of Maunakea. Located 500 feet below the summit, TMT's site was chosen because of its lack of archaeological, cultural or biological impact. It was also selected in response to concerns from Native Hawaiians that no more development on the summit of Maunakea and its puu be considered, as these cultural areas need to be protected.

Are there archaeological features on the TMT site?

No, the lands comprising the TMT site and the access road leading to the site have no archaeological features, shrines, burials or Historic Properties (any building, structure, object or rock formations which is over 50 years old). This was reported in the Archaeological Inventory Survey for the Thirty Meter Telescope Observatory (April 2010) by Cultural Surveys Hawai'i, Inc. In addition, an Archaeological Inventory Survey of the Astronomy Precinct in the Mauna Kea Science Reserve was performed by Pacific Consulting Services, Inc. (January 2010) and reported similar findings for the area of the TMT site.

Why can't TMT be put in place of one of the existing telescopes?

The decision was made specifically to not place the TMT at the site of one of the existing summit ridge facilities, as that would require a large amount of grading, most of it in wekiu habitat, and because the visual impact would be much greater. The 2000 Mauna Kea Science Reserve Master Plan identified the northwest plateau as the most appropriate location for a telescope like TMT. The site was selected because it is not visible from any of the places that people consider the most sacred on the mountain and because there are no endangered native flora or fauna in the immediate area, and because a suitable site can be developed without a lot of grading.

Environmental

Will TMT have an impact on the aquifer?

TMT will install a zero-discharge wastewater system, with all wastewater collected and transported off the mountain for proper treatment and disposal. In addition, hydrologists have determined there is no reasonable prospect of adverse impact on Hawai'i Island's aquifer. There are no wells extracting groundwater near the summit of Maunakea; the nearest wells are approximately 12 miles away in Waiki'i Ranch along Saddle Road.

What are the risks for chemical spills and hazardous waste?

TMT has a multi-step approach to prevent waste emission. The containment walls will be doubled to prevent leaks and spills. In addition, TMT has committed to avoid mercury in its project.

What other environmental considerations are being made by TMT?

TMT is committed to responsible management of the TMT Observatory and is already minimizing its impact on this special place. Environmental considerations include use of a special reflective aluminum-like coating to reduce the visibility of the structure as well as a commitment to leave zero waste.

How much larger is TMT than the existing observatories on Maunakea?

TMT is designed to be as compact as possible. Even with its unprecedented mirror size, TMT will only be three stories taller than the Gemini Observatory and have a footprint that is comparable to the Keck Observatory. The entire project area is expected to take one percent, or five acres, of the astronomy precinct on Maunakea. The building itself will be 180 feet high and 14 feet below ground level.

How many telescopes are currently located on Maunakea?

There are currently 13 telescopes on Maunakea. The state plans to decommission five telescopes before TMT is operational; two are being decommissioned now. The remaining observatories produce significant scientific data.

Engagement & Education

What is TMT doing to be part of the community?

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, the team is focused on meeting the island's communities' needs with innovative programming in education, infrastructure and mālama 'āina (honoring the land). Specific activities include participation in island astronomy events, the launch of new tutoring programs at various Hawai'i Island schools, classroom presentations, among others.

TMT Hawai'i staff are also focused on listening to and learning from local community members, developing strong partnerships and supporting programs based on input from communities in Hawai'i. In the past, TMT has contributed educational resources in Hawai'i focused on college scholarships, internships and STEM education. TMT is learning from the community that the educational needs in Hawai'i are much broader than STEM and college scholarships, and they are working with the community to address those needs.

Financial

What is TMT paying for lease rent?

The TMT sublease provides that it shall pay annual rents based on calendar years during the term of the sublease. Starting in 2014 for the first three years, the rent was \$300,000 per year, followed by \$400,000 per year for the fourth and fifth years, followed by \$600,000 per year for the sixth and seventh years, followed by \$700,000 per year for the eighth and ninth years, followed by \$900,000 per year in the tenth year and then \$1,080,000 per year for the balance of the term. Beginning in January 2015 and in January of each year thereafter, the annual rent is adjusted for inflation. Eighty percent of the lease rent goes to the stewardships of the mountain and the remaining twenty percent goes to the Office of Hawaiian Affairs.

How many jobs will be created to operate TMT?

During the 10-year construction timeline, TMT will create approximately 300 local construction jobs. Once the telescope is completed, TMT will spend almost \$40 million annually in observatory operations and employ approximately 140 employees. TMT commits to fill these positions with as many Hawaii residents as possible.

Science

From a science perspective, why build TMT?

Once built, TMT will be 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. With its 30m diameter primary mirror, TMT will provide an unparalleled resolution and sensitivity,

with images more than 12 times sharper than those from the Hubble Space Telescope and nine times the light-gathering area of the largest current optical telescopes

TMT scientists selected Maunakea after a rigorous five-year campaign spanning the entire globe that measured virtually every atmospheric feature that might affect the performance of the telescope. Located above approximately 40 percent of Earth's atmosphere, the site at Maunakea has a climate that is particularly stable, dry, and cold; all of which are important characteristics for capturing the sharpest images and producing the best science.

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Note: Regarding spelling of Maunakea, we use the spelling preferred by the UH Hilo Ka Haka `ula o Ke`elikolani College of Hawaiian Language.