

# Haleakala Observatories

## Institute for Astronomy

**Haleakala**, "House of the Sun". (For information on the cultural significance of Haleakala:)

While observing a Haleakala sun rise, Mark Twain was quoted as exclaiming " I felt like the last man, neglected of the judgment, and left pinnaced in mid-heaven, a forgotten relic of a vanished world."

In the spring of 1951, while looking for one of the best sites in the world to undertake **radio astronomy experiments**, Grote Reber said "Mauna Kea and Mauna Loa on the island of Hawai'i, each with 4.24 km altitude, are most desirable scientifically. However, Haleakala on the island of Maui is the most practical due to the relatively easy access." (*Reber 22 Dec 1911-20 Dec 2002*)

In April of 1955, Dr. Walter R. Steiger of the University of Hawai'i Department of Physics conducted a site survey study near the summit of Haleakala to determine the suitability of the location for a solar observatory. (*For additional historical information from Walter, please follow this link [The Haleakala Period.](#)*)

On October 4, 1957, the Soviets launched **Sputnik**, the first artificial satellite (man-made moon) to be placed in orbit around Earth. A letter was sent to retired Eastman Kodak Vice President, Dr. C.E. Kenneth Mees, by Dr. Fred Whipple, director of the Harvard College Observatory and Smithsonian Astrophysical Observatory. Dr. Whipple explained the need for a satellite tracking station in Hawaii to form a vital link in a 12-station worldwide tracking network. Dr. Mees turned to the University of Hawaii and offered financial assistance if the University would undertake the project. Additional funding was received from the National Science Foundation and in later years from NASA.

In 1961, an Executive Order by Governor Quinn set aside land on the summit of Haleakala in a place known as Kolekole, to be under the control and management of the University of Hawai'i which established the "**Haleakala High Altitude Observatory Site**", sometimes referred to as Science City.

January 24, 1964, the University of Hawai'i dedicated a Haleakala observatory that would help scientists lasso the secrets of the sun. The **Mees Solar Observatory** was named for Dr. C.E. Kenneth Mees who was a pioneer in the development of photographic emulsions for astronomy, a financial benefactor and supporter of the University's acquisition of the Haleakala High Altitude Observatory Site.

In 1965, the Defense Department's Advanced Research Projects Agency (ARPA) constructed an observatory on land leased, at no cost, from the University of Hawai'i to be operated by the University on Michigan. At that time the 60-inch (1.6 meter) reflector was one of the worlds 10 largest astronomical telescopes. Additionally, two 48-inch (1.2 meter) infrared telescopes were installed in an

adjacent dome. One would be used for tracking missiles and the other for basic research. This site would grow to become the Maui Space Surveillance Complex.

In 1967 the University of Hawai'i founded the Institute for Astronomy (IfA). The IfA's primary research activities include the study of galaxies, cosmology, stars, planets, and the Sun. Its faculty and staff are also involved in astronomy education, and in the development and management of the observatories on Haleakala and Mauna Kea. At this point in time, the IfA's assets included the Mees Solar Observatory, the newly constructed [Zodiacal Light Observatory](#) directed by Dr. Jerry L. Wineberg and the [Waiakoa Laboratory](#) in Kula.

The last University of Hawai'i Observatory built on Haleakala was the [Lunar Ranging Experiment \(LURE\) Observatory](#) which was constructed in 1974. LURE utilized a high-powered pulsed laser to obtain distance measurements to five reflector arrays left on the Moon by three Apollo missions and two Russian Federation robot spacecraft. This data allowed scientists to determine the distance between the Earth and the moon to an accuracy of less than 2.0 centimeters (May 1995). The data was also used to monitor the movements of Earth's tectonic plates, length of the Earth's day (rate change rotation) and polar motion. The accurate determination of the lunar orbit has also allowed scientists to test portions of Einstein's theory of relativity. Starting in the late 1980's the project shifted its focus to Satellite Laser Ranging (SLR). This effort is similar to LLR, except the targets are reflector equipped artificial Earth satellites. SLR times of flight measurements are also used in the study of plate tectonics, as well as for the accurate determination of the orbit of the target spacecraft. Precise orbit determination is needed to calibrate space borne measurement equipment. The LURE SLR project was terminated in July of 2004.