

The Giant Magellan Telescope is a go

Construction phase begins for the Great Magellan Telescope (GMT) to be placed in Chile. At first light in 2021, it will be the largest telescope in existence, with images 10 times sharper than Hubble's.

The project's 11 international partners have secured more than US\$500 million to begin work on what they say will be the first of a new generation of large ground-based telescopes and the largest optical telescope in existence. The decision to begin construction initiates final design and fabrication of the GMT, which will be located at Las Campanas Observatory in Chile's Atacama Desert. The Giant Magellan Telescope will have a 25.4-metre primary mirror comprised of seven separate 8.4-metre diameter segments. Each mirror segment weighs 17 tons and takes one year to cast and cool, followed by more than three years of surface generation and meticulous polishing.

A statement from the GMT collaborators said that this new telescope is designed to:

- discover Earth-like planets around nearby stars
- detect the tiny distortions that black holes cause in the light from distant stars and galaxies.
- It will reveal the faintest objects ever seen in space, including extremely distant and ancient galaxies, the light from which has been travelling to Earth since shortly after the Big Bang, 13.8 billion years ago.

The telescope will be housed in a dome 22 stories high, and is expected to see first light in 2021 and be fully operational by 2024.

Funding for the project comes from the partner institutions, governments and private donors, including Australia (see below).

THE STORY

The Giant Magellan Telescope (GMT) is slated to be the first in a new class of extremely large telescopes, capable of producing images with **10 times the clarity of those captured by the Hubble Space Telescope, which has a diffraction limit at visible light of 0.1 arcseconds**. The telescope will be built at the Carnegie Institution for Science's Las Campanas Observatory in the dry, clear air of Chile's Atacama Desert (where also some of the other international telescopes are located).

MANAGING THE GMTO

The Giant Magellan Telescope Organization (GMTO) manages the GMT project on behalf of its international partners: Astronomy Australia Ltd., The Australian National University, Carnegie Institution for Science, Fundação de Amparo à Pesquisa do Estado de São Paulo, Harvard University, Korea Astronomy and Space Science Institute, Smithsonian Institution, Texas A&M University, The University of Arizona, The University of Chicago, and The University of Texas at Austin.

AK, from EarthSky Notes
and the Giant Magellan Telescope Organization



The location and elevation of the GMT offers a key advantage in terms of seeing through the atmosphere.



Hundreds of actuators will constantly adjust the mirrors to counteract atmospheric turbulence measured by laser pointer.



The GMT will have a diffraction limit of 0.01 arcseconds, and its images 10 times the resolution of Hubble Space Telescope.



The innovative configuration of mirrors allow scientists to see faint sources of light with unparalleled sensitivity and clarity.



The Giant Magellan Telescope will help astronomers unravel the remaining and elusive mysteries of the cosmos.