

Canada's new Hawaiian aerie— Anatomy of a telescope

A progress report on the Canada-France-Hawaii Telescope. The new world-class instrument is now in the final stages of construction and well on target for completion by 1978.

What started as an astronomer's dream in 1972 is now barely 18 months from becoming reality. Today, the new Canada-France-Hawaii Telescope is quickly taking shape at the 4 250 m (14,000 ft.) summit of Mauna Kea, an extinct volcano on the island of Hawaii. For the past several years, design and construction have been guided by a partnership between Canada, France and the State of Hawaii.

During this time, work has gone ahead in various locations around the world on the telescope's numerous working components. Later this year, the pieces will begin crossing the Pacific Ocean to the observatory site

where they will all come together within the dome.

The heart of the telescope's optical system is a 144-inch (3.6 m) diameter main mirror made of Cer-Vit, a ceramic which looks rather like glass but does not expand or contract with heat. It will give the new instrument almost twice the diameter and four times the light collecting area of any telescope now operated by Canada or France.

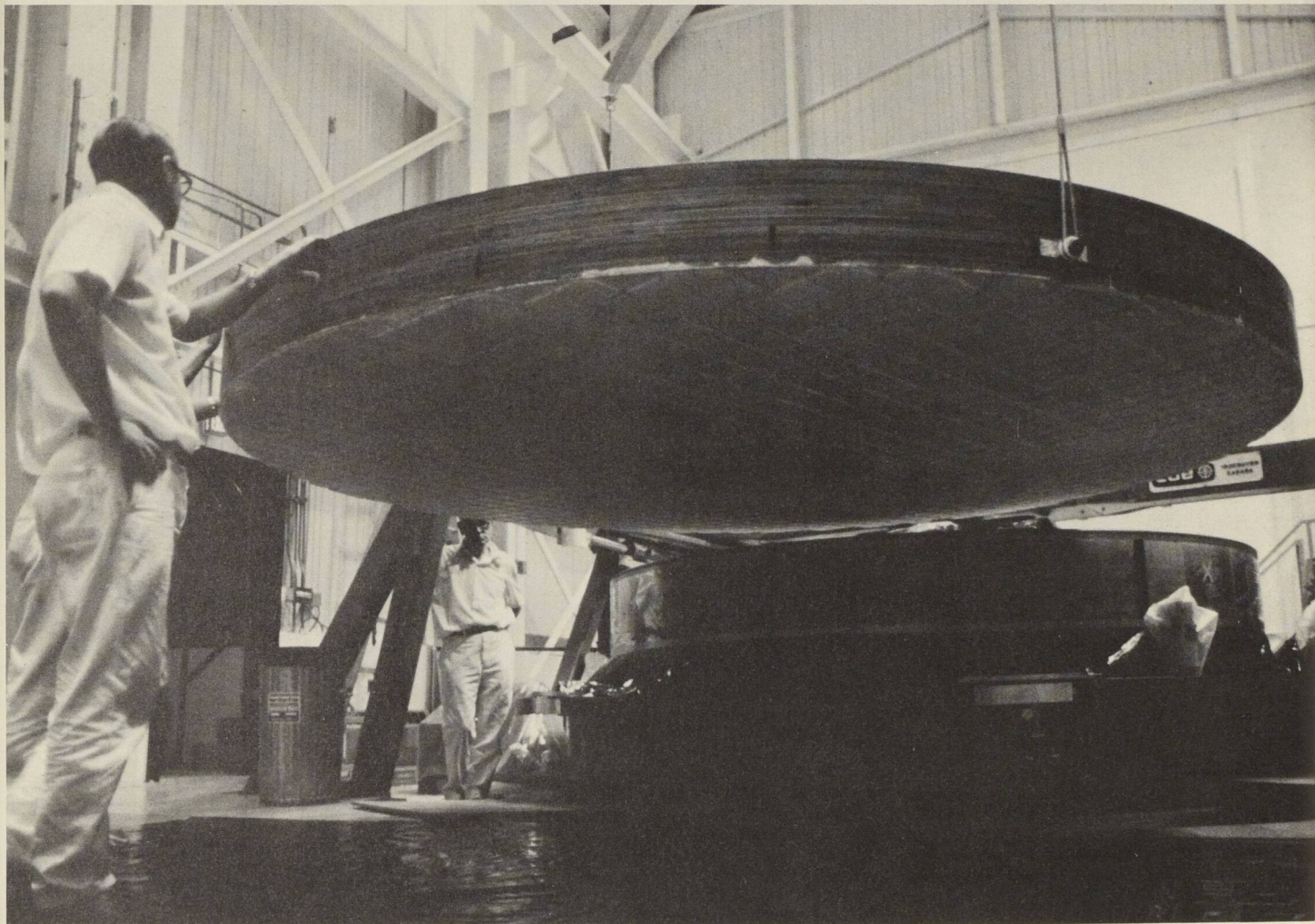
As originally cast, the block of Cer-Vit for the mirror was about 60 cm (nearly two feet) thick and weighed about 13 t (14 tons). Since 1973, over a third of a ton of material has been removed during grinding and polishing at NRC's Dominion Astrophysical Observatory in Victoria, B.C., one of the few places in the world capable of finishing such large mirrors. Optical technicians are currently in the final "parabolizing" stages of this painstaking

three-year process. After working with progressively finer grit and polishing compounds, they will hone the mirror's shiny surface to an accuracy of several millionths of a centimetre (a millionth of an inch). Such high tolerances will enable the telescope to reap maximum advantage from its chosen site in Hawaii.

On Mauna Kea itself, construction at the telescope site is now virtually complete. No sooner had ground been broken in 1974 than work began on a thick concrete pier to act as a foundation for the massive structure above it. A surrounding metal framework and white steel cladding (in effect an outer jacket) were added in the following year. Next, work went ahead on the interior facilities such as dark rooms, laboratories, mechanical and electronic shops. Recently, the telescope's dome, which had been pre-fabricated in Bri-

The large grinding tool being lowered into position over the mirror blank (Shot 1975).

Mise en place de l'imposant outil de meulage sur l'ébauche du miroir (1975).



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