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India to be central part of Thirty Metre Telescope project

India is likely to contribute about 10% of the approximately $1.4-2 bn required to build the telescope

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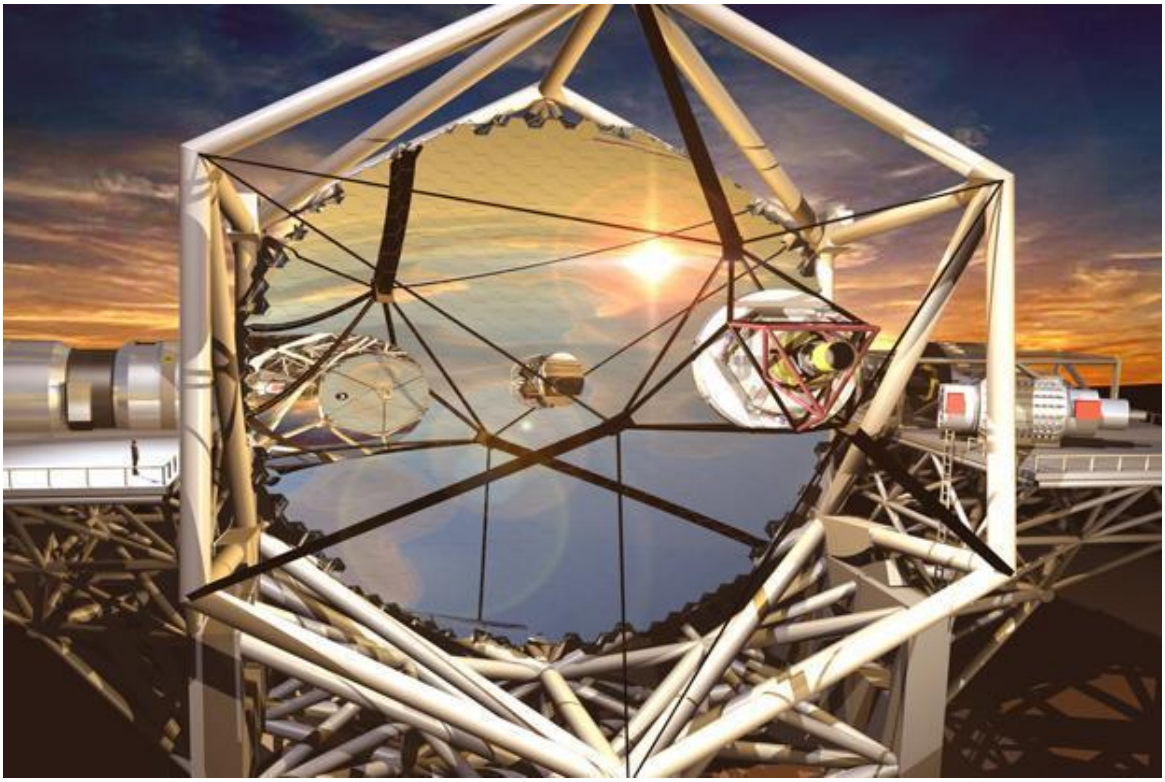

An artist's interpretation of the TMT. Photo: TMT

India is likely to make key parts, develop software and partly fund the development of the so-called Thirty Meter Telescope (TMT), the largest of its kind that is being planned atop Mauna Kea, Hawaii, one of the tallest mountains in the world.

"India's contribution is to a lot of the key parts of the primary mirror system and the main mirror is 30m in diameter. That is the most important parameter in any telescope," said Gary Sanders, project manager, TMT, "That mirror is made out of 492 (hexagonal) mirror

segments and they all act like one mirror. All of the supports, the very delicate ones, will be made here in India."
In addition, India will also make the sensors that will locate where one mirror is with respect to its neighbours so that a computer can calculate how to adjust them as well as the actuators, or devices that will use computer controls to physically move the telescope, Sanders said.

"Qualitatively, I think this will be a more important contribution than that of India's to the CERN project," said Ram Sagar, director of the Aryabhatta Research Institute for Observational Sciences, which is involved with the project.

The TMT will be the first of a generation of so-called extra-large telescopes that will be a significant leap over the current class of telescopes that are 8-10m in diameter. Others being planned include the Giant Magellan Telescope and the European Extremely Large Telescope. If and when the latter is set up, it's planned to become the largest of its kind at 39m. These telescopes will be at least 81 times more sensitive than the current class of telescopes available and therefore provide, several times more quickly, much sharper images of distant galaxies. They are expected to provide deeper insight into the mysterious dark energy and dark matter—that is believed to make up at least 95% of our universe; the role of black holes in the evolution of galaxies and throw light on the origin and dynamics of the Milky Way.

Indian experts associated with the project said that India is likely to contribute about 10% of the approximately $1.4-2 billion required to build the telescope, though this is yet to be cleared by the Indian government and nearly 70% of this would be in kind, in the form of hardware, materials and software

In comparison, India had contributed nearly $25 million to the Large Hadron Collider (LHC) project at CERN, Geneva, but much of these were software and mechanical support devices for the various detectors at the LHC.

"We've been in talks for over four years with GOAL, L&T, Godrej and have some test prototypes ready," said B. Eswar Reddy, programme director, India TMT Coordination Centre, "Most don't have any direct experience for making such devices for a high-science project. There's a lot that needs to be done."

Much, however, needs to be done in the TMT project, which is expected to start construction late next year and be ready to be used for scientific purposes by 2021.

Other than India, the project will include the US, Canada, Japan and China. Each of these countries will contribute between 10% and 20% of the project cost.

Last year, India announced its decision to be involved with TMT as an observer. Being an observer in a project is distinct from being a partner. Partnering country scientists get much more time on the telescope and greater say in project planning and design.