

LIQUID MIRROR TELESCOPE IN DEVASTHAL SEES FIRST LIGHT

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The primary mirror of the International Liquid Mirror Telescope at Devasthal.

The four-metre International Liquid Mirror Telescope (ILMT) saw the first light recently, gazing out from its vantage on Devasthal, a hill in Uttarakhand, into the deep sky.

The telescope, staring at the sky overhead, will make sky surveys possible and obtain images that can help observe transient phenomena such as supernovae and record the presence of space debris or meteorites — basically, watch the skies.

The telescope has been built by a collaboration of scientists from Canada, Belgium and India. It is located at an altitude of 2,450 metres on the Devasthal Observatory campus of the Aryabhata Research Institute of Observational Sciences (ARIES) in Nainital district, an autonomous institute under the Department of Science and Technology, Government of India.

A large pool of mercury placed in a vessel is spun around so fast that it curves into a parabolic shape. Since mercury is reflective, this shape helps in focusing the reflected light. A thin sheet of mylar protects the mercury from the wind.

“It was thrilling to see the formation of the primary mirror. Nearly 50 litres of mercury, weighing close to 700 kilograms, is spun hard to form a paraboloid mirror of just 4 mm thickness and a diameter of about 4 metres,” says Kuntal Misra, Project Investigator at ARIES. She has worked in this project since January 2020.

First image

The first image made by the telescope consisted of several stars and a galaxy, NGC 4274, which is 45 million light years away.

The telescope, having a primary mirror that is liquid, cannot be turned and pointed in any direction. It “stares” at the zenith and watches the sky as the earth rotates, thereby giving a view of different objects.

This property can be used to scan and survey the sky, observe transients and moving objects such as meteorites.

It will work in tandem with the existing 3.6-metre Devasthal Optical Telescope.

Once it starts making observations, the telescope will collect gigabytes of data, which will need to be analysed using artificial intelligence and machine learning (AI and ML) tools.

“In a night’s observation, it will make thousands of images which cannot be analysed by just looking at them. We will need to develop and train AI and ML tools to do this,” says Dipankar Banerjee, Director of the ARIES Observatory.

With the monsoon expected soon in the area, the real observations may start only in October, after the rains, according to Dr. Banerjee.

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