

SCIENTISTS TO TEST LAND FOR LIGO

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The LIGO detectors discovered the first gravitational waves produced by two giant merging blackholes in 2016. | Photo Credit: [REUTERS](#)

The Environment Ministry has allowed scientists to test the suitability of land in Maharashtra's Hingoli district to host the India wing of the ambitious Laser Interferometer Gravitational Wave Observatory (LIGO) project. This is a key step to establishing the one-of-its-kind astronomical observatory.

The project involves constructing a network of L-shaped arms, each four kilometres long, which can detect even the faintest ripples from cosmic explosions millions of light years away.

The discovery of gravitational waves earned three U.S. scientists the Nobel for physics in 2017. The scientists were closely involved with LIGO. Hosting such a detector in India, scientists have said, will improve the odds of detecting more such phenomena.

However the construction of such a large, sensitive device — there are only three of its kind in the world — requires an extremely flat surface.

The LIGO-India consortium, made up of physicists from several institutes, had submitted a proposal to “prospect” 121 hectares of forest land in Dudhala village, Hingoli.

Typically, mining companies prospect a region by sinking boreholes to get a sense of the geology of the site and ascertain availability of required minerals and metals. In the case of the LIGO project, it is to check if the land can be made perfectly level at a reasonable cost.

“We are in the process of acquiring the necessary land — some of it is private and some barren forest land,” said Tarun Souradeep, spokesperson, LIGO-India and a professor at the Inter-University Centre for Astronomy and Astrophysics. “We have to level the land and assess the time and effort it will take for this.” The consortium is yet to formally declare the Dudhala site as the host of the interferometers.

The prospecting permission, according to the minutes of the forest clearance committee meeting of the Union Environment Ministry, was only for sinking boreholes in 0.375 hectares and separate permission would be needed at a later stage for constructing the observatory.

Network of detectors

The LIGO project operates three gravitational-wave (GW) detectors. Two are at Hanford in the State of Washington, north-western USA, and one is at Livingston in Louisiana, south-eastern USA. Currently these observatories are being upgraded to their advanced configurations.

The proposed LIGO-India project aims to move one Advanced LIGO detector from Hanford to India. The LIGO-India project is an international collaboration between the LIGO Laboratory and three lead institutions in the LIGO-India consortium: Institute of Plasma Research, Gandhinagar; IUCAA, Pune; and Raja Ramanna Centre for Advanced Technology, Indore. The LIGO lab would provide the complete design and all the key detector components. Indian scientists would provide the infrastructure to install the detector and it would be operated jointly by LIGO-India

and the LIGO-Lab.

The project, piloted by the Department of Atomic Energy (DAE) and Department of Science and Technology (DST), reportedly costs 1,200 crore and is expected to be ready by 2025.

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