Detector to observe gravitational waves likely to be constructed in India

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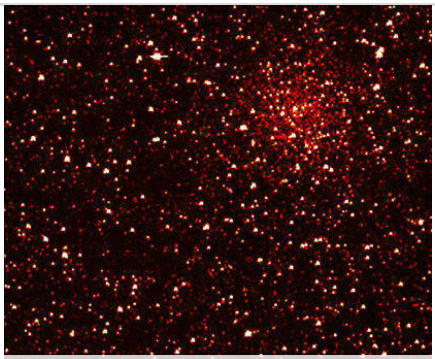
LIGO laboratory | Eisenstein's theory of relativity | Detector to observe gravitational waves

AHMEDABAD: The proposal to set up an advanced Laser Interferometer Gravitational-Wave Observatory (LIGO) detector for detection of gravitational waves is under active consideration of Indian funding agencies like DST and DAE.

If approved, the mega science project — as part of an India-US joint programme — will help expand the worldwide network of detecting gravitational waves — holding the key to mysteries behind the black holes.



(Gravitational waves can...)

"It (proposal) is under active consideration of Indian funding agencies like department of science and technology (DST), department of atomic energy (DAE). And this mega science project is likely to included in the fifth five year plan," IIT-Gandhinagar Professor Anand Senupta said.

Gravitational waves can help unfold the mystery behind black holes and how they merge, offering fresh perspective to the global science fraternity on Eisenstein's theory of relativity, experts in astrophysics said.

LIGO is a large scale physics experiment aiming to directly detect gravitational waves. The LIGO laboratory was set up with permission from US National Science Foundation (NSF) in America and is only the organization which manages these detectors.

The LIGO laboratory in US has offered to provide all of the designs and hardware for one of the two planned Hanford advanced LIGO detectors to be installed, commissioned, and operated by an Indian team of scientists in a facility to be built in and by India, they said.

In August last year, the US board approved the LIGO laboratory's request to modify the scope of advanced LIGO by not installing the US based Hanford "H2" interferometer, and to prepare it instead for storage in anticipation of sending it to LIGO-India, experts said.

"LIGO operates two detectors — one in Hanford and other in state of Lousiana. These two detectors are separated as far as possible with each other because the science demands that they have longest baseline possible," Sengupta said.

"And one of the two proposed advance detectors at Hanford is now proposed to be set up on Indian soil," he said.

"Actually it's important that the third LIGO detector is proposed to be set up in India, since it offers the longest baseline possible on earth," says Sengupta, principal investigator of LIGO science MoU.

"Because USA is 180 degrees opposite to India, therefore, it provides the longest baseline possible," he claimed.

There are ten institutions from India who have come under one banner called IndIGO (Indian Initiative in Gravitational-wave Observations) and have signed a memorandum of understanding (MoU) with the LIGO scientific collaboration.

"Our involvement in LIGO is through what is called as LIGO scientific collaboration, which is a collaboration of 800 scientists worldwide," Sengupta said.

"The thrust of the MoU is that we shall work towards making the detection of gravitational waves a reality and the expertise which is available across the 10 institutions including IIT-Gandhinagar will join forces either to analyze data or develop instruments or provide managerial services to make LIGO India happen," he said.

Highlighting the importance of India for setting up the detector, Sengupta said, "Geographically, India is very critically located as far as setting up of this LIGO detector is concerned."

"If we place the detector in the Indian subcontinent, it greatly enhances the network of LIGO detectors worldwide — that is why our participation is important," he said.

"Many Indian scientists have recently been trained on LIGO detectors in USA, and they have come back and taken faculty jobs in various top institutions," Sengupta informed.