BY 2020

India may join int'l study on Einstein's theory

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BENAULIM: By 2020, India could be one of the countries, including the US and Italy, to play a major role in understanding Albert Einstein's theory of general relativity, said Kip Thorne, professor of theoretical physics at the California Institute of Technology, speaking at the International Conference of Gravitation and Cosmology 2011 at Benaulim on Thursday

The US-based National Science Foundation is in talks with the Indian government to build the world's fourth advanced ground-based observatory in India. The government will have to fund the Rs1,200 crore observatory project over 15 years.

The Planning Commission has cleared the project, which is now being studied by the Department of Atomic Energy and the Department of Science and Technology.

General relativity explained gravity in terms of the curvature of four dimensional space-time and predicted the existence of black holes. The observatory will help spot gravity waves, the discovery of which will prove general relativity beyond doubt.

Gravity waves are generated when black holes, or neutron stars, collide with one another.

"A new age in black hole research is dawning," said Thorne. "Numerical simulations on the computer and gravitational wave observatories will show results in a few years. By 2020, we want to move to India for better precision or angular resolution. This is also a good opportunity for India to work with the most advanced technology and high precision instruments."

The US has two observatories known as the Laser Interferometer Gravitational Observatory (LIGO), while Italy has the third called the Virgo Interferometer. If the Indian observatory — LIGO-India — materialises, the country will join the global network of gravitational wave detectors. The fifth observatory is likely to be in Japan.

Until September, the US National Science Foundation was considering Australia as a site for the observatory. The Australian government refused to fund the international collaborative project.

Establishing an observatory in India assumes importance because the further the distance between the observatories, the greater will be the accuracy in locating gravity waves.

"If it takes 44 milliseconds for light to travel around the earth's diameter, it takes 39 milliseconds for it to travel between India and the US," said professor Tarun Souradeep, of the Inter University Centre for Astronomy and Astrophysics in Pune.

ABOUT LIGO-INDIA

- LIGO-India is a collaboration between Pune-based Inter University Centre for Astronomy and Astrophysics, the Raja Ramana Centre for Advanced Technology in Indore and the Institute of Plasma Research at Ahmedabad
- Last month, LIGO-India submitted the proposal for the ₹1,200-crore project to be built over 15 years was submitted to the Department of Atomic Energy and Department of Science and Technology. The US-based National Science Foundation is also reviewing the project and decision is expected by April.