

## Note on LIGO-India

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LIGO-India is arguably the most ambitious, large scale mega-science projects planned on Indian soil. The Union cabinet of India granted an 'in principle' approval to LIGO-India on February 17, 2016. The project will establish a state-of-the-art advanced LIGO gravitational wave (GW) observatory on Indian soil in collaboration with the LIGO Laboratory in the USA, operated by Caltech and MIT. LIGO-India will allow considerably improved localisation of the gravitational wave sources on the sky opening the door to significantly enhanced prospects for GW astronomy. The global science community is unanimous that the future of Gravitational wave astronomy and astrophysics, beyond the first discovery announced in Feb. 2016, lies with the planned global array of GW detectors, including the LIGO-India observatory. LIGO-India brings forth a great opportunity of Indian scientists and technologists stepping forward, with strong international cooperation, into the frontier of an emergent area of high visibility presented by the recent GW detections and the promise of a new window of gravitational-wave astronomy to probe the universe.

The LIGO-India proposal is for the construction and operation of an advanced LIGO (with displacement sensitivity:  $4 \times 10^{-20}$  m/ $\sqrt{\text{Hz}}$ ) in India in collaboration with the LIGO Laboratories, USA. The advanced LIGO detectors are Michelson interferometers of arm-length 4 km each, with light path folding by about 300 multiple reflections on two mirrors implemented by Fabry-Perot cavities inside the Michelson arms. LIGO-India proposal was submitted to Department of Atomic Energy (DAE) and the Department of Science and Technology (DST) immediately in November 2011 and presented at a meeting of the Planning Commission committee on mega projects in Delhi. The project was recommended by the mega-science committee and the Atomic Energy Commission soon after in the following year.

The LIGO-India project is being jointly executed by lead institutions: the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune of the University Grants commission, and DAE organisations, Institute for Plasma Research (IPR), Gandhinagar, the Raja Ramanna Centre for Advanced Technology (RRCAT), Indore and the Directorate of Construction & Estate Management (DCSEM) of DAE. LIGO-India is being jointly funded by the Department of Atomic Energy (DAE) and the Department of Science and Technology (DST). A LIGO-India Apex committee, together with the LIGO-India Project Management Board (LI-PMB) and LIGO-India Scientific Management Board (LI-SMB), were constituted in August 2016 to oversee the project execution and achieving the science goals.