

**GOVERNMENT OF INDIA
SPACE
LOK SABHA**

UNSTARRED QUESTION NO:2888
ANSWERED ON:10.12.2014
WORLD S LARGEST TELESCOPE
Panda Shri Baijayant "Jay"

Will the Minister of SPACE be pleased to state:

- (a) whether India has contributed to building the worlds` largest thirty metre optical Telescope at Mauna Kea in Hawaii;
- (b) if so, the details thereof;
- (c) whether India has also participated in the ALMA project (Atacama Large Millimetre Array); and
- (d) if so, the details thereof and if not, the reasons therefor?

Answer

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

(a) Yes, Madam.

(b) The Union Cabinet has given its approval for India's participation in the Thirty Metre Telescope (TMT) project at Mauna Kea, Hawaii, USA at a total cost of `1299.8 crores from 2014-2023. From the Indian side, this will be a joint project of the Department of Science and Technology (DST) and the Department of Atomic Energy (DAE) with a DST share of `675.25 crores and DAE share of `624.55 crores.

TMT will be constructed by an international consortium consisting of institutions from USA, Canada, Japan, India and China. With its contributions, India will be a 10% partner in the project and 70% of its contributions will be "in kind". This will translate into 25-30 observing nights on the telescope for Indian scientists per year.

The Thirty Metre Telescope (TMT) will be one of the largest optical-infrared telescopes to come up in the next decade. Its 30 metre diameter primary mirror will consist of 492 segments of 1.44-metre diameter each. These mirror segments will be cleverly positioned relative to each other through sophisticated sensors, actuators and control systems so that the entire assembly behaves like one big mirror. Its performance will be further improved by employing "adaptive optics" techniques thereby achieving performance as if the telescope is located above the Earth's atmosphere.

TMT will enable scientists to study fainter objects far away from us in the Universe, which gives information about early stages of evolution of the Universe. Also, it will give us finer details of not-so-far-away objects like undiscovered planets and other objects in the Solar System and planets around other stars. This partnership will also enhance our technological capabilities in high-technology areas such as primary mirror segment figuring and polishing, mirror support system and edge sensor assembly and testing, software for observatory controls, data analysis pipelines, adaptive optics techniques etc.

This will be a national project anchored in the Indian Institute of Astrophysics (IIA), Bangalore and led by IIA, Aryabhata Research Institute of Observational Sciences (ARIES), Nainital and Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune. It will leverage the best of science and technology from wherever available in the country" from R&D institutions, higher educational institutions and the industry. And, all interested scientists from the country will get time on the TMT for their scientific studies on competitive basis.

The implementation of the project will be overseen by a high-level Executive Council co-chaired by Secretary, DST and Chairman, Atomic Energy Commission & Secretary, DAE.

(c)&(d) The Atacama Large Millimeter/sub-millimeter Array (ALMA) is an international astronomy observatory under the partnership of Europe, North America and East Asia in cooperation with the Republic of Chile. The ALMA science operations began in 2013. India's participation is mainly in the form of submitting proposals to use the observatory for scientific studies.