GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
STARRED QUESTION NO. 49

TO BE ANSWERED ON WEDNESDAY, JULY 20, 2016

INNOVATION IN SPACE SCIENCE

***49. SHRI PR. SENTHIL NATHAN:**

SHRIMATI V. SATHYA BAMA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has taken up new innovative projects for the development of Space Science, Space Research and Satellite Technology in the country;

(b) if so, the details of the new space research projects under taken during the last three years,year-wise;

(c) the various steps taken by the Government to provide adequate funds for the development of various autonomous institutions and labs of ISRO in the country; and

(d) the total funds allocated and spent by the Union Government for the said purpose during the last three years?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PG & PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

(a) to (d) A Statement is laid on the Table of the House.

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STATEMENT LAID ON THE TABLE OF THE LOK SABHA IN REPLY TO STARRED QUESTION NO. 49 REGARDING "INNOVATION IN SPACE SCIENCE" ASKED BY SHRI PR. SENTHIL NATHAN AND SHRIMATI V. SATHYA BAMA FOR ANSWER ON WEDNESDAY, JULY 20, 2016.

(a) Yes Madam.

(b) Innovation is an integral part of Research and Development activities carried out by Indian Space Research Organisation (ISRO) towards the development of Space Science, Space Research and Satellite Technology. The details of the new innovative space research projects undertaken/ realised during the last three years, year-wise is given under:

Year	Project undertaken / realized	Innovation
2013	Indian Regional Navigation Satellite System (IRNSS) (*rechristened as NavIC*)	• Unique constellation design of Geostationary (GEO) and inclined Geo-synchronous (GSO) satellites to ensure 24 x 7 visibility of all the spacecrafts over Indian subcontinent to provide optimal position, navigation & timing services.
	Realisation of INSAT-3D satellite	• First geostationary sounder system over Indian Ocean region for providing vertical profiles of temperature and humidity.

2014	**Insertion of Mars Orbiter Mission (MOM) into Martian orbit**	• **First Indian spacecraft to have on-board autonomy, to manage crucial operations like insertion into the Martian orbit, fault detection, isolation & reconfiguration of systems and operations during non-visibility to earth.** • **Development of highly sensitive radio receivers, powerful transmitters and antenna system to manage deep space communication up to 400 million km.** • **Development of Delta-DOR technique to enable accurate navigation modeling.**
	Realisation of Crew module Atmospheric Re-entry Experiment (CARE) Mission	• **Innovative mission planning in a sub-orbital flight with respect to the launch, controlled re-entry into the atmosphere, splashdown and recovery.** • **Development of critical technologies for Deceleration system with redundant parachutes in clustered configuration and Indigenous thermal protection system.**
2015	**Realisation of Astrosat**	• **Involvement of academia and research institutions in the country for realisation of instruments.** • **Simultaneous multi-wavelength (from Ultraviolet to X-Ray) observations of stars & galaxies from single platform.** • **Indigenous realisation of high resolution ultraviolet mirrors, thin foil X-ray optics, high pressure gas filled detectors**

	NASA-ISRO Synthetic Aperture Radar (NISAR)	• **Indigenous development of S-band Synthetic Aperture Radar for all weather and day/night imaging.**
	ADITYA-L1 - scientific mission for solar studies	• **Trajectory to Halo orbit around the Sun-Earth Lagrangian point 1 (L1), which is about 1.5 million kilometre from the Earth to enable continuous viewing of the Sun.** • **Highly polished primary mirror and spectro-polarimetry using coronagraph payload.** • **Thermal design and attitude for accurate Sun pointing.**

(c) The autonomous institutions/ labs under the administrative control of Department of Space are – (i) Indian Institute of Space Science & Technology, Thiruvananthapuram, (ii) Physical Research Laboratory, Ahmedabad, (iii) North-Eastern - Space Applications Centre, Shillong, (iv) National Atmospheric Research Laboratory, Gadanki and (v) Semi-conductor Laboratory, Chandigarh. Adequate funds are made available by the Government to meet the programmatic requirements of these autonomous institutions/ labs.

(d) The total funds allocated and spent by these autonomous institutions/ labs during the last three years are as under:

(₹ in Crores)

S.N.	Financial Year	Funds Allocated	Spent
1.	2013-2014	263.23	263.23
2.	2014-2015	336.23	332.70
3.	2015-2016	451.98	451.68

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