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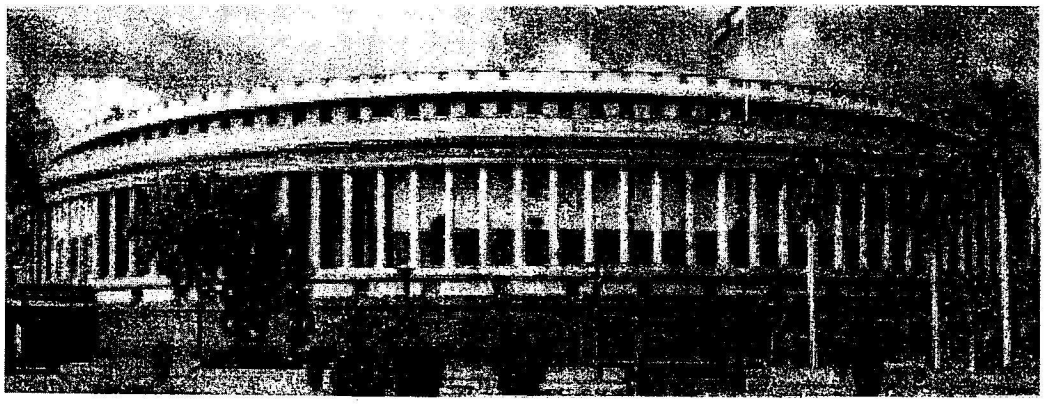
GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

"SPACE IN PARLIAMENT"



BUDGET SESSION OF PARLIAMENT 2017
(FEBRUARY – MARCH 2017)

COMPILATION OF REPLIES GIVEN IN PARLIAMENT DURING 2017

Government of India
Department of Space
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PARLIAMENT QUESTIONS – BUDGET SESSION OF PARLIAMENT 2017

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.947

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

ISRO ROVER ON LUNAR SURFACE

947. DR. K. GOPAL:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO is going to deploy rover on lunar surface;

(b) if so, the details thereof;

(c) whether the wheeled rover would be useful in suing multiple applications by collecting soil and rock sediments and if so, the details thereof; and

(d) whether ISRO has not yet finalized the timing of its launch and if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam. Indian Space Research Organisation (ISRO) is planning to deploy a rover on the lunar surface in the Chandrayaan-2 mission.

(b) The Chandrayaan-2, India's second mission to the Moon, is a totally indigenous mission comprising of an Orbiter, Lander and

Rover. After reaching the 100 km lunar orbit, the Lander housing the Rover will separate from the Orbiter. After a controlled descent, the Lander will soft land on the lunar surface at a specified site and deploy a Rover.

(c) The six-wheeled Rover will move around the landing site in semi-autonomous mode as decided by the ground commands. The instruments on the rover will observe the lunar surface and send back data, which will be useful for analysis of the lunar soil. Collection of soil and rock sediments is not planned in this mission.

(d) ISRO is working towards the launch of Chandrayaan-2 during the first quarter of 2018.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.958

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

INTER-PLANETARY MISSION

958. SHRI RATTAN LAL KATARIA:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO is planning to undertake Venus and Jupiter inter-planetary missions;

(b) if so, the details thereof;

(c) whether ISRO is preparing any action plan for achieving the above targets and if so, the details thereof; and

(d) the type of satellite and rocket which will be capable of accomplishing this job?

ANSWER

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

(DR. JITENDRA SINGH):

(a) to (d)

After Chandrayaan-1 and India's first interplanetary mission 'Mars Orbiter Mission', the feasibility of future inter-planetary missions to Mars and Venus are under discussion and presently a study team is exploring various options and opportunities for such missions. Based on the recommendations of the study team, a plan for realising future interplanetary missions will be considered.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.970

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

LAND SENSING SATELLITE DATA

970. SHRI NARANBHAI KACHHADIYA:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has given any approval to Indian Space Research Organisation (ISRO) and Geological Survey of the United States of America (USGS) for cooperation in sharing of American Land Remote Sensing Satellite data;

(b) if so, the details thereof; and

(c) the manner in which ISRO and USGS will be able to use satellites of each other for sharing the information of common interest?

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 Memorandum of Understanding (MoU) between Indian Space Research Organisation (ISRO) and United States Geological Survey (USGS) has been signed on July 09, 2016 for

cooperation in the exchange and use of satellite remote sensing data. Under this MoU, USGS is facilitating availability of data of Indian region using American remote sensing satellites viz. Landsat-7 and Landsat-8 to ISRO. ISRO is facilitating availability of data of US region using Indian remote sensing satellite 'Resourcesat-2' to USGS.

(c) The sharing of each other's satellite remote sensing data provides enhanced frequency of earth observation data to both organisations. The AWiFS payload (onboard Resourcesat-2) enables USGS to acquire earth observation data every 5 days. The Landsat satellites enable ISRO to acquire multi-spectral earth observation data including thermal data. These data sets help both countries to carry out applications in the field of natural resources inventory & management and disaster management support.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.1004

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

REGIONAL POSITIONING SYSTEM

1004. SHRI G.M. SIDDESHWARA:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) is undertaking a project to deploy a regional positioning system for India and if so, the details thereof; and

(b) the details of progress made in this regard and budget allocated for the project and the details of the benefit of such project?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Yes Madam. Indian Space Research Organisation (ISRO) has deployed an indigenous regional positioning system for India named as "Navigation with Indian Constellation" (NavIC). It consists of seven satellites in a constellation to provide Position, Navigation and Timing (PNT) services in Indian mainland and surrounding region up to 1500 Km. It provides two types of services viz. Standard Positioning Service (SPS) and Restricted Service (RS).

7

(b) All the seven satellites of the constellation have been placed in designated orbits. The ground segment comprising of 15 Ranging and Integrity Monitoring Station, 2 Navigation Centres, Network Timing Facility with redundancy and 1 Satellite Control Facility have been established. A budget of ₹ 1420 Crore has been approved by the Government for the realisation of the system including satellites and associated ground segment.

The benefits of NavIC system include – (i) establishing India's own independent navigational satellite system providing position, navigation and timing services and (ii) enabling applications in the areas viz. terrestrial, aerial & marine navigation, precise timing services, vehicle tracking, fleet management, mapping survey and geodetic data capture, disaster management support.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.1008

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

83 SATELLITES IN ONE GO

1008. SHRI VENKATESH BABU T.G.:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO has launched RESOURCESAT-2A Agni-4 and is also planning to launch 83 satellites in one go;

(b) if so, the details thereof and the number of satellites launched during the last three years, year-wise and the features thereof;

(c) whether ISRO is proposing to launch more satellites in the near future;

(d) if so, the details thereof and the time by which these are likely to be launched;

(e) 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) ISRO has launched the remote sensing satellite 'RESOURCESAT-2A' onboard India's Polar Satellite Launch Vehicle (PSLV-C36) on December 07, 2016 from Satish Dhawan Space Centre, Sriharikota. Agni-4 does not fall under the

purview of ISRO/ DOS. ISRO is planning to launch 104 satellites in one go onboard PSLV-37 scheduled for launch in February 2017.

(b) These 104 satellites planned to be launched on board PSLV-C37 comprises of - (i) Indian Remote Sensing Satellite 'Cartosat-2 Series' (weighing ~ 727 kg) as primary payload along with two Indian Nano Satellites viz. INS-1A & INS-1B (weighing ~19 kg) and (ii) Remaining 101 satellites (weighing ~ 646 kg) are from foreign countries namely, Dubai, Israel, Kazakhstan, Netherlands, Switzerland and USA. The satellites from foreign countries are being launched as part of the commercial arrangement entered into between the foreign customer and Antrix Corporation Limited (Antrix), the commercial arm of ISRO.

ISRO has launched 20 satellites during the last three years i.e. 2014, 2015 and 2016. The details are placed in Annexure-I.

(c) & (d)

Yes, Madam. ISRO proposes to launch about 18 satellites during January 2017 to December 2018. These satellites include 8 earth observation satellites, 6 communication satellites, 1 navigation satellite, 1 space science satellite and 2 experimental Nano satellites.

(e) Does not arise.

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ANNEXURE-I

Annexure referred to in reply to part (b) of Lok Sabha Unstarred Question No. 1008 for answer on 08/02/2017

Sl. No.	Satellite	Launch Date	Weight (Kg)	Purpose of Satellite
1.	GSAT-14	05-01-2014	1982	Communication
2.	IRNSS-1B	04-04-2014	1425	Navigation
3.	IRNSS-1C	16-10-2014	1425	Navigation
4.	GSAT-16 *	07-12-2014	3182	Communication
5.	IRNSS-1D	28-03-2015	1425	Navigation
6.	GSAT-6	27-08-2015	2117	Communication
7.	ASTROSAT	28-09-2015	1515	Space Science
8.	GSAT-15 *	11-11-2015	3164	Communication
9.	IRNSS-1E	20-01-2016	1425	Navigation
10.	IRNSS-1F	10-03-2016	1425	Navigation
11.	IRNSS-1G	28-04-2016	1425	Navigation
12.	Cartosat-2 Series	22-06-2016	727	Earth Observation
13.	SWAYAM	22-06-2016	1	Experimental
14.	SATYABHAMASAT	22-06-2016	1.5	Experimental
15.	INSAT-3DR	08-09-2016	2211	Weather & Climate
16.	SCATSAT-1	26-09-2016	371	Weather & Climate
17.	PRATAHAM	26-09-2016	10	Student
18.	PISAT	26-09-2016	5.25	Student
19.	GSAT-18 *	06-10-2016	3404	Communication
20.	RESOURCESAT-2A	07-12-2016	1235	Earth Observation

**** indicates satelites launched using foreign launch vehicles***

GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.1076

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

ROCKETS LAUNCHED BY ISRO

1076. SHRI KAPIL MORESHWAR PATIL:

PROF. PREM SINGH CHANDUMAJRA:

SHRI GAURAV GOGOI:

Will the PRIME MINISTER be pleased to state:

(a) the number of rocket launches undertaken by ISRO during the last three years;

(b) the number of foreign satellites launched, expenditure incurred thereon and revenue raised therefrom;

(c) the number of rocket launches and satellite launches proposed during the ensuing three years; and

(d) the funds provided and the R&D activities undertaken by ISRO during the said period along with the new technologies developed?

ANSWER

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

(DR. JITENDRA SINGH):

(a) During the last three years i.e. January 2014 to December 2016, ISRO has undertaken seventeen (17) rocket launches,

which includes thirteen (13) launches of PSLV, three (03) launches of GSLV and one (01) experimental flight of GSLV-MkIII.

(b) During the last three years i.e. January 2014 to December 2016, 44 satellites from 8 countries have been successfully launched by ISRO on-board Polar Satellite Launch Vehicles (PSLVs). These satellites were launched under a commercial arrangement between Antrix Corporation Limited (Antrix), the commercial arm of ISRO and the foreign customers. Antrix has earned a total revenue of about 98 Million Euros through launching of these 44 foreign satellites.

(c) About Twenty-Four (24) satellites are proposed to be realised during the ensuing three years i.e. January 2017 to December 2019. Out of these, twenty-two (22) satellites will be launched using twenty Indian launch vehicles and two (2) satellites will be launched through procured launch services.

(d) During the last three years i.e. 2013-14, 2014-15 and 2015-16, the funds allocated to Department of Space are given below:

Financial Year	Amount Allocated (RE) *(₹ in Crore)*
2013-14	5172.04
2014-15	5826.00
2015-16	6959.44

During the above said period, various R&D activities undertaken by the Department towards development of

technologies include (i) development of Air Breathing Propulsion, (ii) Re-usable Launch Vehicle-Technology Demonstrator, (iii) High Thrust Cryogenic Engine (iv) re-entry technologies Crew Module, (v) Multi-object Tracking Radar (vi) Lithium ion Batteries, (vii) 75mN Stationery Plasma Thrusters, (viii) Pressure Transducer (ix) Search and Rescue Beacon, (x) 6m S-Band unfurlable Antenna, (xi) NavIC constellation for navigational Services (xii) Geo-stationary atmospheric sounder, (xiii) Critical Technologies for Human Spaceflight, (xiv) Indigenization of Space Materials & Components.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.1112

TO BE ANSWERED ON WEDNESDAY, FEBRUARY 8, 2017

INDUSTRY BUILT SPACECRAFT

1112. SHRI A. ARUNMOZHITHEVAN:

Will the PRIME MINISTER be pleased to state:

(a) whether ISRO has roped in a consortium of six companies to deliver the country's first industry built spacecraft;

(b) if so, the details thereof;

(c) whether the first spacecraft will be brought out in around nine months; and

(d) if so, the details thereof?

ANSWER

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

(DR. JITENDRA SINGH):

(a) & (b)

No Madam. ISRO has not engaged industry to build a spacecraft. However, ISRO is involving a consortium of 6 industries only for Assembly, Integration and Testing (AIT) of two similar satellites, wherein the sub-systems and infrastructure is being provided by ISRO. The AIT of the first

satellite will be carried out by a joint team of ISRO & Industry and of the second satellite by industry team independently.

(c) Yes Madam.

(d) The AIT activities are planned to be realised with respect to a navigation satellite 'IRNSS-1H' of Navigation with Indian Constellation (NavIC).

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.2079

TO BE ANSWERED ON WEDNESDAY, MARCH 15, 2017

BREW BEER ON MOON

2079. SHRI SISIR KUMAR ADHIKARI:

Will the PRIME MINISTER be pleased to state:

(a) whether an Indian Spacecraft is planning to brew beer on the moon;

(b) if so, the details of research plan and viability of yeast test therefor; and

(c) the universal rules on moon lander therein?

ANSWER

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

(DR. JITENDRA SINGH):

(a) No Madam. There is no plan to brew beer on the moon by any spacecraft to be made by Indian Space Research Organisation (ISRO).

However, Team Indus, a privately funded team under the Axiom Research Labs Pvt. Ltd., is competing for the Google Lunar XPRIZE competition towards building a spacecraft capable of soft landing and roving on the Moon. The spacecraft is proposed to be launched onboard ISRO's Polar Satellite

Launch Vehicle (PSLV) under a commercial launch agreement. As understood from media reports that, Team Indus is proposing an experiment to brew beer on the Moon using yeast.

(b) As understood, the aim of this experiment is to test and observe the survivability of yeast in space and how it performs under Moon's gravity conditions. The experiment plans to brew a small batch of beer in space.

(c) The activities in Outer Space including moon and other celestial bodies are governed by UN treaties on Outer space activities namely - (i) Outer Space Treaty, 1967, (ii) Moon Agreement 1979. Further, the protection of planetary environment is governed by COSPAR Planetary Protection Policy 2002.

These treaties and policies govern the scientific exploratory activities in outer space, moon and other celestial bodies using human made spacecraft, landers, rovers etc., without causing harmful contaminations to the environment in outer space, moon and other celestial bodies and to Earth as well by bringing extra-terrestrial materials. Such activities need to be authorized by the State concerned.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.2155

TO BE ANSWERED ON WEDNESDAY, MARCH 15, 2017

ACHIEVEMENTS OF MARS ORBITER MISSION

2155. SHRI FEROZE VARUN GANDHI:

Will the PRIME MINISTER be pleased to state:

(a) the details of achievements of Mars Orbiter Mission (MOM) till date along with details of its proposed life span;

(b) whether the Indian Space Research Organisation (ISRO) is considering to expand its programme; and

(c) if so, the details thereof along with the potential benefits that shall accrue due to such proposed extension and the associated costs involved?

ANSWER

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

(DR. JITENDRA SINGH):

(a) Mars Orbiter Mission (MOM) is India's first interplanetary mission. The main purpose of MOM, as a technology demonstration mission, is to demonstrate India's capability to insert MOM in Martian orbit and operating Mars Orbiter spacecraft for 6 months. The significant achievements of MOM include:

- Mars orbiter spacecraft has been successfully inserted into elliptical orbit around Mars on September 24, 2014. It has completed 29 months in its orbit around Mars and is presently functioning satisfactorily. Considering the availability of propellant and health parameters, MOM is expected to function for more years.

- Scientific payloads onboard MOM continues to provide valuable data of Mars surface and its atmosphere. Mars Color Camera has captured more than 630 images of the Martian surface.

- It has provided excellent opportunities in planetary research for the scientific community of the country. Archived data was released on September 24, 2016 for free download for scientific research. It has witnessed more than 210 GB of data download from 1175 registered users. So far, seventeen (17) scientific papers have been published in national and international journals.

- It is first Indian spacecraft to incorporate full scale on-board autonomy to overcome the long distances and the communication gaps due to non-visibility periods. It is also the first Mars mission in the world to succeed in the Mars Orbit Insertion at its very first attempt.

(b) & (c)

As per the orbit of MOM, a long eclipse of about 400 minutes was expected during January 2017. To avoid the eclipse, a maneuver of MOM was conducted. This activity ensures no

eclipses till 2020. MOM has been in orbit for more than one Martian year and is expected to survive for many more Martian years. This extended life of MOM will facilitate increased observation of Mars by the five scientific payloads on-board MOM and facilitate extensive planetary science data analysis, which can help the scientific community to understand Mars better. It would also enable coverage of Mars in different seasons. A cost of about ₹ 5.0 crores is expected to be incurred annually, towards ground operations support.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.2197

TO BE ANSWERED ON WEDNESDAY, MARCH 15, 2017

LAUNCH OF SATELLITES

2197. SHRIMATI SUPRIYA SULE:

SHRI RAMA KISHORE SINGH:

DR. HEENA VIJAYKUMAR GAVIT:

SHRI SATAV RAJEEV:

DR. KIRIT SOMAIYA:

SHRI ASADUDDIN OWAISI:

SHRI DHANANJAY MAHADIK:

SHRI MANOJ TIWARI:

SHRI VENKATESH BABU T.G.:

SHRI RATTAN LAL KATARI A:

SHRI P. NAGARAJAN:

DR. C. GOPALAKRISHNAN:

Will the PRIME MINISTER be pleased to state:

(a) whether Indian Space Research Organisation (ISRO) placed 104 satellites in space in a single launch by its Polar Satellite Launch Vehicle;

(b) if so, the details thereof;

(c) whether majority of satellites were from foreign countries and if so, the details thereof;

(d) the foreign exchange earned out of this satellite launch;

(e) whether India plans to go to Venus for the first time and revisit the red planet Mars; and

(f) if so, the details thereof and the time by which the mission to Mars and Venus will be undertaken?

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) Indian Space Research Organisation (ISRO) has successfully launched 104 satellites, in a single launch, onboard India's Polar Satellite Launch Vehicle 'PSLV-C37 on February 15, 2017 from Satish Dhawan Space Centre (SDSC), Sriharikota. These satellites include - (i) India's Cartosat-2 Series Satellite (weighing 714 kg) as primary payload, (ii) two Indian Nano-Satellites viz., INS-1A & 1B (together weighing 18.1 kg) and (iii) 101 foreign nano-satellites (together weighing 645.9 kg) from six countries as co-passengers.

(c) Yes Madam. Out of the 104 satellites launched in this mission, 101 nano satellites were from foreign countries viz. Israel (1), Kazakhstan (1), The Netherlands (1), Switzerland (1), UAE (1) and USA (96). These nano satellites from foreign countries were launched under a commercial arrangement between Antrix Corporation Limited (Antrix), the commercial arm of ISRO and the foreign customer.

(d) Antrix has earned a revenue of about half of the cost of launch vehicle in terms of foreign exchange.

(e) & (f)

After Chandrayaan-1 and India's first interplanetary mission 'Mars Orbiter Mission', the feasibility of future inter-planetary missions to Mars and Venus are under discussion and presently a study team is exploring various options and opportunities for such missions. The study team's recommendations will be reviewed by Advisory Committee for Space Sciences (ADCOS) for further considerations.

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
UNSTARRED QUESTION NO.2256

TO BE ANSWERED ON WEDNESDAY, MARCH 15, 2017

STRENGTH OF SCIENTISTS AND ENGINEERS IN ISRO

2256. SHRI RAGHAV LAKHANPAL:

Will the PRIME MINISTER be pleased to state:

(a) the existing number of scientists and engineers in position in the Indian Space Research Organisation (ISRO) and whether there is any shortage of engineers/scientists in ISRO and if so, the details thereof; and

(b) the steps taken/being taken by the Government to meet the shortage of scientists and engineers in ISRO?

ANSWER

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

(DR. JITENDRA SINGH):

(a) At present, a total of 7062 Scientists/ Engineers are in position in ISRO. The demand for space based services in the country is increasing resulting in increased launch frequency and applications of space technology in emerging areas. To meet the work load arising due to these demands, a proposal for suitably augmenting the manpower, mostly in scientist/engineer category, has been prepared.

(b) **The proposal has been reviewed and recommended by the Space Commission and the same is submitted to the Department of Expenditure, Ministry of Finance, for their recommendations, before placing the same for the approval of the Union Cabinet.**

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GOVERNMENT OF INDIA
DEPARTMENT OF SPACE

LOK SABHA
STARRED QUESTION NO.287

TO BE ANSWERED ON WEDNESDAY, MARCH 22, 2017

SPACE INNOVATION CENTRES

*287. **SHRI R. DHRUVA NARAYANA:**

DR. KIRIT P. SOLANKI:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has any plan to set up Space Innovation Centres in collaboration with the Indian Space Research Organisation (ISRO) so as to encourage young researchers keen on exploring space technology and if so, the details thereof;

(b) whether such centres are proposed to be a part of Universities and if so, the details thereof;

(c) the mechanism in place for covering the costs of such institutions;

(d) the system for ensuring transparency and accountability in such research institutions; and

(e) the initiatives taken by the Government to encourage and promote interests in space research/space related fields especially amongst the youth?

ANSWER

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

(DR. JITENDRA SINGH):

(a) to (e) 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.287 REGARDING "SPACE INNOVATION CENTRES" ASKED BY SHRI R. DHRUVA NARAYANA AND DR. KIRIT P. SOLANKI FOR ANSWER ON WEDNESDAY, MARCH 22, 2017.

(a), (b), (c) & (d)

As on date, there is no plan to setup Space Innovation Centres in the country.

However, DOS/ ISRO has a specific programme named Sponsored Research (RESPOND), which is intended for encouraging academia and young researchers to participate in research activities and promote quality research in Indian universities/ institutes in wide range of areas with respect to space technology, space science and space applications. Under RESPOND programme, ISRO has also set up Space Technology Cells at premiere institutions like Indian Institute of Technologies (IITs) - Bombay, Kanpur, Kharagpur & Madras; Indian Institute of Science (IISc), Bangalore and Joint Research Programme with University of Pune (UoP) to carry out research activities in the areas of space technology and applications.

(e) Department of Space (DOS) has taken following initiatives to encourage and promote interest in space science and research amongst the youth:

(i) The space science and planetary missions, viz. Chandrayaan-1, Mars Orbiter Mission, ASTROSAT, were undertaken by ISRO to renew the interest of young minds towards space science.

(ii) ISRO - Space Science Promotion Scheme (ISRO-SSPS), started during 2008-09 period, is an initiative towards supporting and strengthening of research in space sciences in the universities.

Under this scheme, ISRO has been providing funding support to eight universities for strengthening academic activities and augmenting laboratory facilities. The salient features of the scheme includes M.Sc / M.Tech fellowship to meritorious students, one time grant for laboratory augmentation and honorarium and travel support for visiting scientists / guest faculties.

(iii) Planetary Exploration (PLANEX) program has been supporting research activities at universities and research institutions to conduct studies in planetary sciences and exploration and allied fields.

(iv) ISRO/ DOS sponsors a symposium "National Space Science Symposium (NSSS)," conducted once in two years to provide a scientific forum for the presentation of new results and to discuss recent developments in space science, planetary exploration and ground-based astronomy programmes/ projects being pursued at various research institutions and universities in India.

(v) ISRO's Sponsored Research (RESPOND) Programme also encourages Junior Research Fellows and young researchers to participate and contribute in various space programme related research activities.

(vi) Department of Space regularly organizes workshops, exhibitions and outreach programmes to create excitement amongst students in space science and technology.

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