## *DEPARTMENT OF SPACE*

DEMAND NO. 92

**Department of Space**

A. The Budget allocations, net of recoveries, are given below:

*(In crores of Rupees)*

| | Major Head | Actual 2012-2013 | | | Budget 2013-2014 | | | Revised 2013-2014 | | | Budget 2014-2015 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Plan | Non-Plan | Total | Plan | Non-Plan | Total | Plan | Non-Plan | Total | Plan | Non-Plan | Total |
| | Revenue | 1741.58 | 1073.05 | 2814.63 | 1875.69 | 1177.00 | 3052.69 | 1546.36 | 1172.00 | 2718.36 | 2346.06 | 1238.00 | 3584.06 |
| | *Capital* | *2041.65* | *...* | *2041.65* | *3739.31* | *...* | *3739.31* | *2453.64* | *...* | *2453.64* | *3653.94* | *...* | *3653.94* |
| | **Total** | **3783.23** | **1073.05** | **4856.28** | **5615.00** | **1177.00** | **6792.00** | **4000.00** | **1172.00** | **5172.00** | **6000.00** | **1238.00** | **7238.00** |
| 1. Secretariat - Economic Services | 3451 | ... | 10.11 | 10.11 | ... | 10.48 | 10.48 | ... | 21.60 | 21.60 | ... | 27.20 | 27.20 |
| **Space Research** | | | | | | | | | | | | | |
| **Space Technology** | | | | | | | | | | | | | |
| **Launch Vehicle Technology** | | | | | | | | | | | | | |
| 2. GSLV MK-III Development | 3402 | 64.84 | ... | 64.84 | 15.00 | ... | 15.00 | 10.00 | ... | 10.00 | 171.10 | ... | 171.10 |
| | 5402 | 7.26 | ... | 7.26 | 124.53 | ... | 124.53 | 70.13 | ... | 70.13 | 9.00 | ... | 9.00 |
| | *Total* | *72.10* | *...* | *72.10* | *139.53* | *...* | *139.53* | *80.13* | *...* | *80.13* | *180.10* | *...* | *180.10* |
| 3. Cryogenic Upper Stage Project (CUSP) | 3402 | ... | ... | ... | 0.10 | ... | 0.10 | 0.10 | ... | 0.10 | 0.10 | ... | 0.10 |
| 4. Polar Satellite Launch Vehicle - Continuation (PSLV-C) Project | 3402 | 154.84 | ... | 154.84 | 25.00 | ... | 25.00 | 10.13 | ... | 10.13 | 15.80 | ... | 15.80 |
| | 5402 | 15.16 | ... | 15.16 | 325.00 | ... | 325.00 | 152.55 | ... | 152.55 | 374.20 | ... | 374.20 |
| | *Total* | *170.00* | *...* | *170.00* | *350.00* | *...* | *350.00* | *162.68* | *...* | *162.68* | *390.00* | *...* | *390.00* |
| 5. Vikram Sarabhai Space Centre (VSSC) | 3402 | 246.25 | 244.20 | 490.45 | 167.49 | 263.49 | 430.98 | 243.00 | 262.00 | 505.00 | 299.56 | 296.66 | 596.22 |
| | 5402 | 170.47 | ... | 170.47 | 301.89 | ... | 301.89 | 206.00 | ... | 206.00 | 392.45 | ... | 392.45 |
| | *Total* | *416.72* | *244.20* | *660.92* | *469.38* | *263.49* | *732.87* | *449.00* | *262.00* | *711.00* | *692.01* | *296.66* | *988.67* |
| 6. Inertial Systems Unit (IISU) | 3402 | 29.25 | ... | 29.25 | 8.12 | ... | 8.12 | 20.25 | ... | 20.25 | 25.43 | ... | 25.43 |
| | 5402 | 28.23 | ... | 28.23 | 60.89 | ... | 60.89 | 47.75 | ... | 47.75 | 51.45 | ... | 51.45 |
| | *Total* | *57.48* | *...* | *57.48* | *69.01* | *...* | *69.01* | *68.00* | *...* | *68.00* | *76.88* | *...* | *76.88* |
| 7. Liquid Propulsion Systems Centre | 3402 | 162.47 | 91.05 | 253.52 | 90.78 | 103.97 | 194.75 | 111.28 | 102.00 | 213.28 | 91.49 | 68.05 | 159.54 |
| | 5402 | 86.61 | ... | 86.61 | 244.34 | ... | 244.34 | 132.72 | ... | 132.72 | 118.51 | ... | 118.51 |
| | *Total* | *249.08* | *91.05* | *340.13* | *335.12* | *103.97* | *439.09* | *244.00* | *102.00* | *346.00* | *210.00* | *68.05* | *278.05* |
| 8. ISRO Propulsion Complex | 3402 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 53.50 | 39.70 | 93.20 |
| | 5402 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 100.30 | ... | 100.30 |
| | *Total* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *153.80* | *39.70* | *193.50* |
| 9. GSLV Operational Project (Including MK-III Operational) | 3402 | 238.90 | ... | 238.90 | 208.90 | ... | 208.90 | 178.00 | ... | 178.00 | 198.66 | ... | 198.66 |

*(In crores of Rupees)*

| | Major Head | Actual 2012-2013 | | | Budget 2013-2014 | | | Revised 2013-2014 | | | Budget 2014-2015 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Plan | Non-Plan | Total | Plan | Non-Plan | Total | Plan | Non-Plan | Total | Plan | Non-Plan | Total |
| | 5402 | 16.10 | ... | 16.10 | 7.01 | ... | 7.01 | 2.00 | ... | 2.00 | 5.01 | ... | 5.01 |
| | *Total* | *255.00* | *...* | *255.00* | *215.91* | *...* | *215.91* | *180.00* | *...* | *180.00* | *203.67* | *...* | *203.67* |
| 10. Space Capsule Recovery Experiment (SRE) | 3402 | 1.00 | ... | 1.00 | 0.50 | ... | 0.50 | 0.05 | ... | 0.05 | 0.25 | ... | 0.25 |
| 11. Manned Mission Initiatives/Human Space Flight Programme | 3402 | 7.50 | ... | 7.50 | 26.75 | ... | 26.75 | 9.19 | ... | 9.19 | 17.05 | ... | 17.05 |
| | 5402 | 2.50 | ... | 2.50 | 0.25 | ... | 0.25 | 0.81 | ... | 0.81 | 0.45 | ... | 0.45 |
| | *Total* | *10.00* | *...* | *10.00* | *27.00* | *...* | *27.00* | *10.00* | *...* | *10.00* | *17.50* | *...* | *17.50* |
| 12. Indian Institute of Space Science & Technology | 3402 | 64.83 | ... | 64.83 | 138.50 | 12.00 | 150.50 | 65.00 | 10.00 | 75.00 | 109.00 | 13.50 | 122.50 |
| 13. Semi Cryogenic Engine Development | 3402 | 28.73 | ... | 28.73 | 68.30 | ... | 68.30 | 24.75 | ... | 24.75 | 48.62 | ... | 48.62 |
| | 5402 | 56.22 | ... | 56.22 | 111.70 | ... | 111.70 | 40.25 | ... | 40.25 | 101.38 | ... | 101.38 |
| | *Total* | *84.95* | *...* | *84.95* | *180.00* | *...* | *180.00* | *65.00* | *...* | *65.00* | *150.00* | *...* | *150.00* |
| 14. Trisonic Wind Tunnel Project | 3402 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 0.50 | ... | 0.50 |
| | 5402 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9.50 | ... | 9.50 |
| | *Total* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *10.00* | *...* | *10.00* |
| **Total-Launch Vehicle Technology** | | **1381.16** | **335.25** | **1716.41** | **1925.05** | **379.46** | **2304.51** | **1323.96** | **374.00** | **1697.96** | **2193.31** | **417.91** | **2611.22** |
| **Satellite Technology** | | | | | | | | | | | | | |
| 15. Resourcesat-2 and 3 | 3402 | 0.38 | ... | 0.38 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | 5402 | 0.40 | ... | 0.40 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | *Total* | *0.78* | *...* | *0.78* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* | *...* |
| 16. ISRO Satellite Centre (ISAC) | 3402 | 120.07 | 112.37 | 232.44 | 128.57 | 114.67 | 243.24 | 125.39 | 104.67 | 230.06 | 122.19 | 106.28 | 228.47 |
| | 5402 | 86.20 | ... | 86.20 | 113.56 | ... | 113.56 | 65.94 | ... | 65.94 | 140.69 | ... | 140.69 |
| | *Total* | *206.27* | *112.37* | *318.64* | *242.13* | *114.67* | *356.80* | *191.33* | *104.67* | *296.00* | *262.88* | *106.28* | *369.16* |
| 17. Laboratory for Electro-Optics System (LEOS) | 3402 | 24.70 | ... | 24.70 | 21.80 | ... | 21.80 | 25.72 | ... | 25.72 | 30.50 | ... | 30.50 |
| | 5402 | 8.16 | ... | 8.16 | 16.80 | ... | 16.80 | 9.28 | ... | 9.28 | 29.63 | ... | 29.63 |

34. **ISRO Telemetry, Tracking and Command Network (ISTRAC):** ISTRAC provides spacecraft TTC and Mission Control services to major launch vehicle and spacecraft missions.

35. **Space Applications Centre (SAC):** SAC is the lead Center for the development of communication, meteorological and remote sensing payloads besides R&D in space applications.

36. **Development and Educational Communication Unit (DECU):** DECU is involved in the conceptualisation, definition, planning, implementation and socio-economic evaluation of developmental space applications.

37. **National Natural Resources Management System (NNRMS):** The National Natural Resources Management System (NNRMS) has the objective of ensuring optimal management/utilization of natural resources by integrating information derived from remote sensing data with conventional techniques.

38. **Earth Observation Applications Mission (EOAM):** The main goal of the Earth Observation Application Mission (EOAM) are to (i) evolve newer application/R&D programmes based on technology trends leading to operational applications programmes; (ii) guiding total remote sensing applications programmes towards implementation of remote-sensing based solutions and (iii) steering remote sensing applications with value-added services to the users.

39. **National Remote Sensing Centre (NRSC):** NRSC is responsible for acquisition, processing, distribution and archiving of data from remote sensing satellites and is continuously exploring the practical uses of remote sensing technology for multilevel (global to local applications).

40. **Indian Institute of Remote Sensing (IIRS):** Indian Institute of Remote Sensing (IIRS), located at Dehradun, is a premier training and educational institute set up for developing trained professional in the field of Remote Sensing, Geoinformatics and GPS Technology for Natural Resources, Environmental and Disaster Management.

41. **Disaster Management Support (DMS):** The main objective of Disaster Management Support Programme is to provide Space inputs & services on a timely & reliable basis for the Disaster Management System in the country.

42. **North Eastern-Space Applications Centres (NE-SAC):** NE-SAC set up as an autonomous society jointly with North Eastern Council, is supporting the North Eastern region by providing information on natural resources utilization and monitoring, infrastructure developmental planning and interactive training using space technology inputs of remote sensing and satellite communication.

43. **Physical Research Laboratory (PRL):** PRL, an autonomous institution funded by the Department of Space through grant-in-aid, is one of the premier research institutions in the country carrying out basic research in several areas of experimental & theoretical physics and earth sciences. PRL is also responsible for the administration of Udaipur Solar observatory.

44. **National Atmospheric Research Laboratory (NARL):** NARL, a registered Society, is responsible for carrying out advanced research in atmospheric and space sciences and related disciplines.

45. **RESPOND:** The (RESPOND) Programme of ISRO supports sponsored research activity in Space Science, Space Applications and Space Technology in various national academic/research institutions and Space Technology Cells in premier technological institutes of the country through grants-in-aid.

46. **Sensor Payload Development/Planetary Science Programme:** It includes funding requirement for advance action for activities related to scientific payload developments for space science and planetary exploration studies in different institutions and universities.

48. **ADITYA:** The ADITYA-1 Project will be the first Indian Space based solar coronagraph, which will be available for solar coronal observation to all the Indian researchers in the field of Solar Astronomy. The major scientific objective of the ADITYA-1 is to achieve a fundamental understanding of the physical processes that heat the solar corona (base to the extended), accelerate the solar wind and produce Coronal Mass Ejections (CMEs).

49. **Astrosat 1 & 2:** The objective of the Astrosat project is to build and launch an astronomical observatory satellite for expanding the scientific knowledge about the evolution of stellar objects and gather valuable scientific data on high energy Astronomy and Astrophysics research.

50. **Indian Lunar Chandrayaan-1 & 2:** The Chandrayaan-1 was successfully launched on October 22, 2008 on-board PSLV-C11. The follow-on mission Chandrayaan-2 is planned to further expand the scientific knowledge about the moon, upgrading the technological capability and providing the challenging opportunity for planetary research for a large number of growing young people of the country benefiting the human society at large.

51. **Mars Orbiter Mission:** Mars Orbiter Mission envisages launching an Orbiter around Mars using Polar Satellite Launch Vehicle (PSLV-XL) during the November 2013 launch opportunity. MARS orbiter will be placed in an orbit of 500 x 80,000 km around MARS and will have a provision for carrying nearly 25 kg of scientific payloads on-board.

52. **ISRO Geosphere-Biosphere Programme (ISRO-GBP):** ISRO-GBP encompasses the study of land and ocean interaction, past climate, changes in atmospheric composition, aerosols, carbon cycle, bio-mass estimation, bio-diversity and other related areas of scientific investigation.

53. **Atmospheric Science Programmes:** Atmospheric Science Programmes is intended to develop advanced observation tools & techniques of atmospheric modeling, leading to operational end user products in different domains of atmospheric science.

54. **Small Satellite for Atmospheric Studies & Astronomy:** The project envisages development of small satellites for study of Earths near space environment, magnetometer studies, study of aerosol and gases, tropical weather and climate studies.

55. **Other Schemes:** These includes Microgravity Research, Space Science promotion, Multi-institutional research programs, Space Station experiment, setting up of Digital workflow systems, support for conferences, symposia, etc.

57. **Development of Space Materials and Components:** Development of Space materials and components is an effort to indigenously develop space grade materials and components

with the help of Indian Industry for Indian Space Programme in order to reduce dependency on foreign sources.

58. **Advance Ordering:** Advance Ordering aims at procurement of certain long lead and critical items for futuristic missions.

59. **Others:** Under this, provision has been included for ISRO Headquarters, International Co-operation and Central Management.

60. **Master Control Facility:** MCF is responsible for initial orbit raising, payload testing and in-orbit operation of all geo-stationary satellites.

61. **INSAT-3 Satellites (including Launch Services):** The objective of INSAT-3 Spacecraft Project are to (i) build five INSAT-3 satellites (INSAT-3A to INSAT-3E) keeping the flexibility for mid-course corrections to accommodate emerging requirements, carry out mission planning, launch campaign and initial phase operations and (ii) establish required programme elements for carrying out the same.

62. **INSAT-4 Satellites (including Launch Services and Leasing of Transponders):** The fourth generation INSAT-4/GSAT Satellite series has been planned to meet the capacity and service requirements projected by various users and development needs of the country.

63. **Service Charges for Leasing INSAT/GSAT Transponders:** This is envisaged for payment of services charges for Leasing of INSAT/GSAT Transponders.

64. **INSAT-3D Launch Services:** INSAT-3D Launch services is towards ensuring procured launch services for INSAT-3D satellite.

65. **GSAT-7 Launch Services:** GSAT-7 is a user funded communication satellite. GSAT-7 was initially planned for launch on-board GSLV. Due to the schedule criticality of GSAT-7 satellite, provision is made for the launch of GSAT-7 satellite through procured launch services.

66. **GSAT-15 Satellite:** GSAT-15 is a communication satellite which will carry 24 Ku-band transponders and a GAGAN payload.

67. **GSAT-15 Satellite - Launch Services:** GSAT-15 satellite - launch services is envisaged for securing procured launch services for GSAT-15 satellite.

68. **GSAT-16 Satellite:** GSAT-16 is a communication satellite which will carry 24 C-band, 12 Upper Ext-C band and 12 Ku-band transponders.

69. **GSAT-16 Satellite - Launch Services:** GSAT-16 satellite - launch services is envisaged for securing procured launch services for GSAT-16 satellite.

70. **GSAT-17 Satellite:** GSAT-17 communication satellite will provide a mix of c-band and ext-C-band and MSS transponders. Weighing about 3500 Kgs, GSAT-17 is intended to be placed at 93.50E orbital location with a provision to move to other orbital locations. The satellite will carry 24 C-band, 2 Lower Ext-C band, 12 Upper Ext-C band, 4 MSS and 1 DRT & SAS & R transponders.

71. **GSAT-17 Satellite - Launch Services:** GSAT-17 satellite - launch services is envisaged for securing procured launch services for GSAT-17 satellite.

72. **GSAT-18 Satellite:** GSAT-18 communication satellite will have a unique mix of ku-band, c-band and ext-C-band transponders. Weighing about 3500 Kgs, GSAT-18 is intended to be placed at 740E orbital location. The satellite will carry 24 C-band, 12 Upper Ext-C band, 12 Ku-band transponders. In addition, it will carry a Ku-band Beacon transmitter.

73. **GSAT-18 Satellite - Launch Services:** GSAT-18 satellite - launch services is envisaged for securing procured launch services for GSAT-18 satellite.

74. **GSAT-19 Satellite:** GSAT-19 is a communication satellite weighing about 3500 Kgs to be launched on-board the first developmental flight of GSLV Mk III vehicle. GSAT-19 will carry 3 Ka-band, 2 C-band and 2 MSS transponders.

75. **GSAT follow-on Satellites including Launch Services:** INSAT/GSAT follow-on missions are the future communication satellites planned during the 12th Plan period. GSAT follow-on missions - Launch Services is envisaged for securing procured launch services for future communication satellites.

76. **Augmentation of Capacity through Leasing of transponders from foreign Satellite:** This is meant for short term augmentation of INSAT/GSAT transponder capacity by leasing of transponders from a foreign satellite to meet the immediate demand for transponders.

77. **Procurement of Heavier class of Satellites:** A heavier class of communication satellite is planned to be procured from a foreign agency to meet the growing demand for communication transponders.