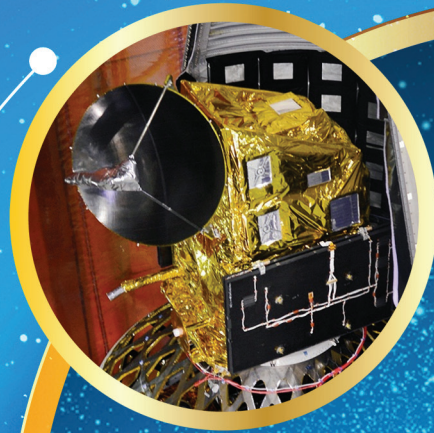


UNNATI

(UNISpace Nanosatellite Assembly & Training by ISRO)

January - March 2019



India's contribution to Unispace+50 initiatives

UNISPACE
+50



UNITED NATIONS
Office for Outer Space Affairs

Infrastructure to build Nano Satellites



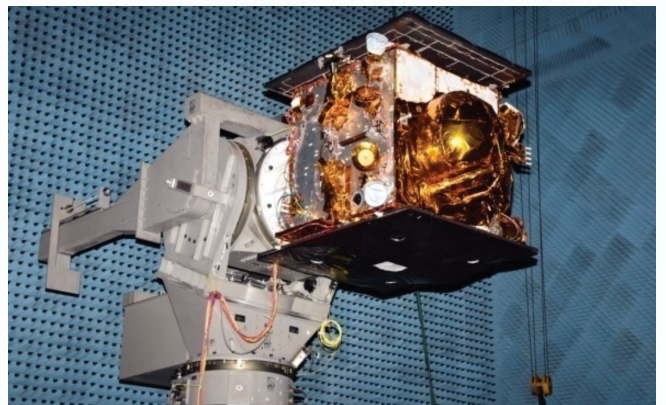
Electronic Fabrication Facility



Hardware in Loop Simulation Facility



Clean Room



Anaechoic Chamber (EMI-EMC Test)



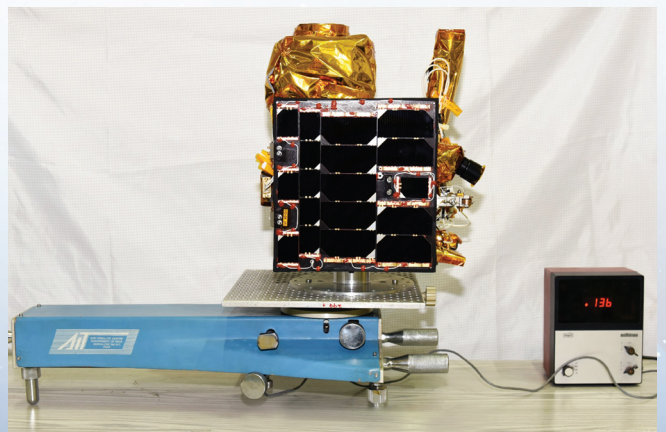
Thermal Vacuum Test Facility



Spacecraft Testing Instruments



Vibration Test Facility



Mass Properties Measurement

Introduction

Indian Space Research Organisation (ISRO) of the Department of Space (DOS), Government of India executes space programme through its establishments located across India. The prime objective of ISRO is to develop space technology and its applications for societal benefits. Over the years, ISRO has carried out its mission of bringing space to the service of the common man and for addressing key issues of national development. As one of the leading space faring nations, ISRO has been actively associated with United Nations Office for Outer Space Affairs (UNOOSA) as member of COPUOS (Committee on the Peaceful Uses of Outer Space) since its inception.

As part of its UNISPACE initiative, UNOOSA is working on a system of 'UN led international constellation of satellites' for disaster risk reduction, GNSS (Global Navigation Satellite Systems), telecommunication and other services for benefit of its members countries across the world. UNOOSA is offering countries a simplified and enhanced access to satellite technologies as part of the UNISPACE initiative.

During the 54th session of Scientific & Technical Subcommittee of COPUOS at Vienna in February 2017, UNOOSA requested Member States to propose new initiatives for the benefit of its member countries. In June 2018, the international community gathered in Vienna to celebrate the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50). During this meet, India announced a capacity building programme, **UNNATI (UNispace Nanosatellite Assembly & Training by ISRO)** on nano satellites development through a combination of theoretical coursework and hands-on training on Assembly, Integration and Testing (AIT).

U. R. Rao Satellite Centre (URSC), formerly known as ISRO Satellite Centre (ISAC), being the ISRO's lead centre for satellite building, has designed the basic structure of this programme with equal emphasis on theoretical and practical exposure. This announcement brochure provides the details of capacity building programme on nano satellite realisation to be conducted in coordination with UNOOSA.



Fabrication and Testing of Nano Satellite

Objectives

The programme aims at capacity building in satellite technology for participants from countries interested in developing space programme by providing hands-on experience in building and testing of nano satellites. The primary objectives of the programme are:

- To offer a simplified and increased exposure to satellite fabrication technologies, as part of the UNISPACE initiative
- To provide theoretical course on satellite technology
- To provide intensive course on nano satellite realisation, covering mission aspects, design, fabrication, assembly, integration & testing
- To provide hands-on training to assemble, integrate and test a low cost, modular nano satellite

Who Should Attend

The course is aimed at **Engineering/ Science graduates or Post graduates** who have an aptitude to learn space technology, design of circuits for various space systems and management of space systems. Each participating country shall nominate a team of 2 members consisting of one Mechanical Engineer and one Electrical / Electronics Engineer. In case a desired engineering candidate is not available, the alternate nominee must have physics background.

Course Duration and Location

The course is designed for a total duration of eight weeks and a batch of thirty (30) participants. The batch of 30 participants will be organised into 3 groups of 10 members each. Each group will work on assembly, integration and testing of a nano satellite. The course will be conducted by URSC, ISRO at Bengaluru, India, consecutively, for a period of three years, starting from January 2019.

Language of Course

The language of the course is English. Only candidates with working knowledge of English need to apply.

Course Structure

The course structure of the programme is as follows:

Module 1: Basics of satellite technology and its applications (Duration: 2 weeks)

The participants will be introduced to the topics of the satellite technology. The major topics covered in this module include:

- Definition of satellite technology
- Relevance of satellite technology in modern society and its applications
- Definition of a mission and its elements
- Classification of satellites
- Mainframe systems
- Payload systems
- Ground segment elements
- Mission operations
- Data reception and product generation
- Data utilisation

Module 2: Nano satellite missions (Duration: 2 weeks)

The major topics covered in this module include:

- Nano satellite definition
- Features of nano satellite and its comparison with large satellite
- Relevance and utility of nano satellites
- Nano satellite and laws governing their impact on space debris
- Design drivers for a nano satellite
- Familiarisation exercise with nano satellite systems
- Reliability & Quality Assurance aspects of nano satellites
- Nano satellite configuration exercise (assigned to the individual group)

Module 3: Hands-on training on nano satellite assembly, integration and testing (Duration: 4 weeks)

The major topics covered in this module include:

- Introduction to assembly, integration and testing activities
- Major milestones of spacecraft integration and their importance
- Documents related to AIT activities
- Handling procedures for spacecraft systems
- Interface checks (mechanical and electrical) and their importance
- AIT sequence
- System integration procedures and practices including grounding guidelines
- Theoretical background for alignment and polarity checks
- Different modes of satellite testing

How to Apply

Details of the programme including application form are available at www.isro.gov.in/unnati. Further clarifications may be obtained from unnati@isac.gov.in.

Selected candidates will be given economy class air fare to and from the country of origin to Bengaluru, India. Accommodation, living expenses and other logistics shall be borne by URSC, ISRO, Bengaluru.

Health and Insurance

During their stay in India, selected candidates are advised to take appropriate medical, life and disability insurance(s) before leaving for India, either by themselves or by their organization on their behalf, towards covering entire health and disability risks. No medical expenses will be borne by URSC, ISRO, Bengaluru.

About ISRO

The Department of Space (DoS) was established by the Government of India in 1972 to promote development of space science and technology and its application for national development. ISRO is the primary agency under the Department of Space for executing its space programmes.

ISRO has established space systems that form an important element of the national infrastructure.

About U. R. Rao Satellite Centre

U. R. Rao Satellite Centre (URSC), Bengaluru is the lead centre of ISRO for design, development and integration of satellites for communication, remote sensing, navigation and scientific studies. URSC is actively involved in research and development in the areas of advanced state of art technologies, total management of all satellite missions, creation of a vibrant



U R Rao Satellite Centre (URSC) - Main Building

space industry for the realisation of space systems, technology transfer, academia interface, etc. URSC is fully equipped with state-of-the-art facilities for fabrication and testing of mechanical and electronic hardware/subsystems and integrated satellite. URSC has realized and launched more than 100 satellites in the area of communication, meteorology, remote sensing, navigation and space science.

About UNOOSA

UNOOSA works to promote international cooperation in the peaceful uses and exploration of space. It also promotes the utilisation of space science and technology for sustainable economic and social development. The Office assists any United Nations Member State to establish legal and regulatory frameworks to govern space activities. It strengthens the capacity of developing countries to use space science technology and applications for development by facilitating the integration of space capabilities into national developmental programmes.

Through the United Nations Programme on Space Applications, UNOOSA conducts international workshops, training courses and pilot projects on topics that include remote sensing, satellite navigation, satellite meteorology, tele-education and basic space sciences for the benefit of developing nations. It also administers the United Nations Platform for Space-based

Information for Disaster Management and Emergency Response (UN-SPIDER).

Together with all stakeholders, the shared goal for UNISPACE+50 is to build a comprehensive Space 2030 agenda that will integrate space activities into sustainable and long-term developmental goals, based on the peaceful exploration and uses of outer space.

About Bangalore

Bangalore, officially called Bengaluru, is the capital of the southern Indian state of Karnataka. It is one of India's most progressive and developed cities, blessed with a benevolent climate.

Bengaluru is accessible by air, road, and rail. Bengaluru Airport, also known as Kempegowda International Airport, has direct international flights from several cities. Bengaluru is popularly known as the 'Silicon Valley' of India for being a major IT hub of the nation. The city also has some wonderful tourist hotspots like the Bangalore Palace, Lal Bagh, Bannerghatta National Park, Innovative Film City and Cubbon Park.

Bengaluru enjoys a relatively mild climate throughout the year. Summer temperatures (February to May) may reach up to 36°C (97°F) and early morning temperatures in the winter (November to January) hover around 15°C (59°F).



Vidhan Soudha - The Karnataka Seat of Power

Important Dates

Programme Announcement: June 2018

For Batch 1:

Commencement of registration	:	August 16, 2018
Last date to apply	:	September 30, 2018
Finalisation of candidates	:	October 31, 2018
Commencement of course	:	January 15, 2019
Completion of course	:	March 15, 2019

For Batch 2:

Commencement of registration	:	May 15, 2019
Last date to apply	:	June 30, 2019
Finalisation of candidates	:	July 31, 2019
Commencement of course	:	October 15, 2019
Completion of course	:	December 15, 2019

For Batch 3:

Commencement of registration	:	May 15, 2020
Last date to apply	:	June 30, 2020
Finalisation of candidates	:	July 31, 2020
Commencement of course	:	October 15, 2020
Completion of course	:	December 15, 2020



U. R. Rao Satellite Centre (URSC)
ISRO, Department of Space
Government of India
Old Airport Road, Vimanapura
Bengaluru, India

Contact us : unnati@isac.gov.in