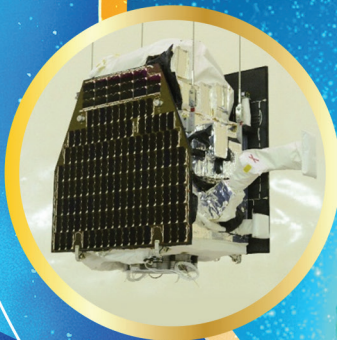
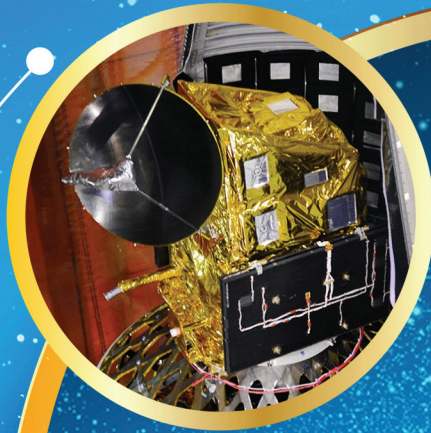


UNNATI

(UNISpace Nanosatellite Assembly & Training by ISRO)

October - December, 2019



India's contribution to UNISPACE+50 initiatives

UNISPACE
+50



UNITED NATIONS
Office for Outer Space Affairs

ISRO's Infrastructure to build Small Satellites



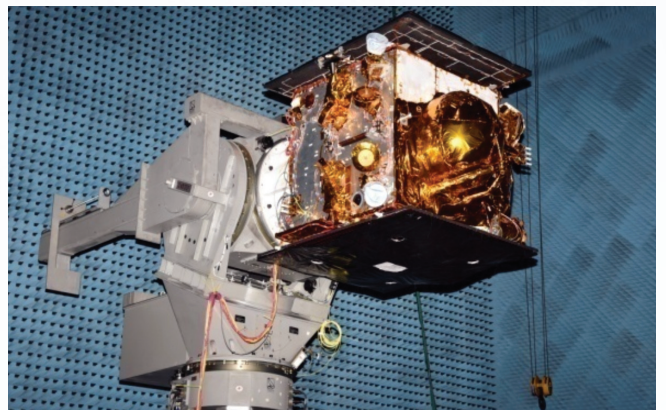
Electronic Fabrication Facility



Hardware in Loop Simulation Facility



Clean Room



Anechoic Chamber (EMI-EMC Test)



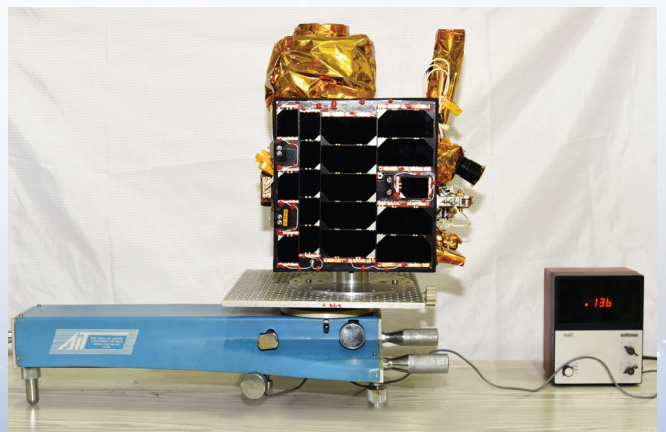
Thermal Vacuum Test Facility



Spacecraft Testing Instruments



Vibration Test Facility



Mass Properties Measurement

Introduction

Indian Space Research Organization (ISRO) of the Department of Space (DOS), Government of India executes space programmes 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 (United Nations Conference on the Exploration and Peaceful Uses of Outer Space) 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 member countries across the world. UNOOSA is offering countries a simplified and enhanced access to satellite technologies as part of the UNISPACE initiative.

On the occasion of the fiftieth anniversary of the first UNISPACE Conference, UNISPACE+50 was held in June 2018. India announced a capacity building training programme, UNNATI (UNIspace Nanosatellite Assembly & Training by ISRO) on nanosatellite development through a combination of theoretical coursework and hands-on training on Assembly, Integration and Testing (AIT). The course for the first batch comprising of 30 participants from 17 countries was held during January 15 to March 15, 2019 at Bengaluru, India.

U. R. Rao Satellite Centre (URSC), formerly known as ISRO Satellite Centre (ISAC) conducted this program. The training programme aimed at building nano satellites through intensive theoretical sessions and practical exposure. The training module provided participants an opportunity to assemble and test a Nanosatellite.

This brochure provides the details of capacity building programme on nanosatellite building for the second batch of UNNATI to be conducted during October 15 to December 15, 2019 in coordination with UNOOSA at Bengaluru, India.



UNNATI Batch-1 participants integrating the nanosatellite



UNNATI Batch-1 participants with Minister of State for Space, Govt. of India, Chairman, ISRO and Director, URSC

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 realization, 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 for a batch of thirty (30) participants. The batch of 30 participants will be organized 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 at URSC, ISRO, Bengaluru, India.

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:

- Introduction to satellite technology
- Satellite Applications
- Mission Objectives
- Mainframe systems
- Payload systems
- Ground segment and Mission operations
- Data reception, product generation
- Data utilization

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
- Nano satellite Applications
- Nano satellite and laws governing their impact on space debris
- Design drivers for a nano satellite
- Familiarization exercise with nano satellite systems
- Reliability & Quality Assurance
- 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
- Theoretical background for alignment and polarity checks
- Different modes of satellite testing

How to Apply

The details of the training programme including application form are available at www.isro.gov.in/unnati. For clarifications, contact unnati@ursc.gov.in.

Selected candidates will be given economy class air fare to and from the country of origin to Bengaluru, India. Boarding and Lodging shall be provided by URSC, ISRO.

Health and Insurance

During their stay in India, selected candidates

are advised to take appropriate medical, life and disability insurance(s) which meets Indian regulations 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 space industry for the realization of space systems, technology transfer, academia interface, etc. URSC is fully equipped with state-of-the-art facilities for fabrication and testing



U.R. Rao Satellite Centre, Bengaluru

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 utilization 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 across the globe. 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, Lalbagh, Bannerghatta National Park, Innovative Film City and Cubbon Park.

Bengaluru enjoys a relatively mild climate throughout the year. Summer temperatures (Feb-May) may reach up to 36°C (97°F) and early morning temperatures in the winter (Nov-Jan) hover around 15°C (59°F). The best time to visit the city is during the months of October to February. During this time the climate remains pleasant with mild, comfortable temperature and very little rainfall. One can enjoy the cool pleasant breeze and a clear weather.



Vidhana Soudha - Seat of Karnataka State Legislature

Important Dates

Programme Announcement : June 2019

For Batch 2:

Commencement of Registration	: June 01, 2019
Last date to apply	: July 15, 2019
Finalisation of Candidates	: August 15, 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



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Government of India
Old Airport Road, Vimanapura
Bengaluru, India

Contact us: unnati@ursc.gov.in