



# UNNATI

(UNispace Nanosatellite Assembly & Training by ISRO)  
2022



India's Contribution to Unispace+50 Initiatives



UNITED NATIONS  
Office for Outer Space Affairs

# *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, India 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.

In June 2018, UNOOSA celebrated the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50) at Vienna, Austria. At this occasion, India announced a capacity building training 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) for the benefit of space aspiring nations. So far ISRO has successfully conducted two batches of the Course benefitting 60 participants from 33 countries viz., Algeria, Argentina, Azerbaijan, Bahrain, Bangladesh, Belarus, Bhutan, Bolivia, Brazil, Brunei Darussalam, Chile, Colombia, Egypt, Indonesia, Kazakhstan, Kenya, Malaysia, Magnolia, Mauritius, Mexico, Morocco, Myanmar, Nepal, Nigeria, Oman, Panama, Peru, Portugal, Republic of Korea, Sri Lanka, Thailand, Tunisia and Vietnam.

ISRO's U. R. Rao Satellite Centre (URSC), formerly known as ISRO Satellite Centre (ISAC) conducted the programmes using its state-of-the-art satellite building facilities. The training programme aims at building Nano satellites through intensive theoretical sessions and practical exposure. The training module provided participants an opportunity to assemble and test a Nano Satellite. This announcement brochure provides the details of capacity building programme on Nano Satellite realization for the third batch of UNNATI to be conducted during October 15 to December 15, 2022 in coordination with UNOOSA.

## 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. Priority will be accorded for the applicants from countries which have not got benefitted from previous two batches.

## 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 Nanosatellite. 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 nanosatellite systems
- Reliability & Quality Assurance
- Nano satellite configuration exercise (assigned to the individual group)

### **Module 3: Hands-on training on nanosatellite 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
- Procedure and practices in System integration
- 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](http://www.isro.gov.in/unnati) Further clarifications if any may be obtained from [unnati@ursc.gov.in](mailto: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 mandatorily 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 realisation 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 of mechanical and electronic hardware/subsystems and integrated satellite. URSC has realized and launched about 114 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 Bengaluru

Bangalore, officially called Bengaluru, is the capital of one of the southern Indian state, 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.

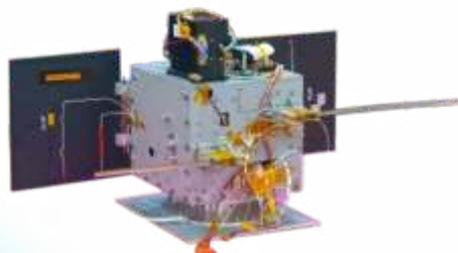
Bengaluru is popularly known as the 'Silicon Valley' of India for being a major IT hub of the nation. The city also has some wonderful tourist hotspots like the Bangalore Palace, Lalbagh, Bannerghatta National Park, Innovative Film City and Cubbon Park.

Bengaluru enjoys a relatively mild climate throughout the year. Summer temperatures (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). 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.

## Programme Announcement: June 2022

### *Important Dates*

|                              |                            |
|------------------------------|----------------------------|
| Commencement of Registration | : <b>June 01, 2022</b>     |
| Last date to apply           | : <b>July 15, 2022</b>     |
| Finalization of Candidates   | : <b>August 15, 2022</b>   |
| Commencement of Course       | : <b>October 15, 2022</b>  |
| Completion of Course         | : <b>December 15, 2022</b> |



Nanosatellite integrated by UNNATI participants

## UNNATI Batch-1 & 2 participants Group photograph





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