K.S. INSTITUTE OF TECHNOLOGY, BANGALORE – 560109
DEPARTMENT OF COMPUTER AND COMMUNICATION ENGINEERING

Report for
Industrial Visit to Indian Space Research Organization (URSC), Bangalore.

Date of conduction: 10th Feb 2025
Sem: VI

Venue: Indian Space Research Organization (URSC), Bangalore

The Indian Space Research Organization is India's national space agency. It serves as the principal research and development arm of the Department of Space, overseen by the Prime Minister of India, with the Chairman of ISRO also serving as the chief executive of the DoS.

The ISRO Satellite Centre (ISAC) was renamed the U R Rao Satellite Centre (URSC) in 2018. The name change was made in honor of Dr. Udupi Ramachandra Rao, the first founding director of ISAC and a former ISRO Chairman.

The exhibits that were shown to students are given below.

1. **Introduction and understanding of Satellites**

   ISRO has built and launched numerous satellites over the years. Their contribution to our country has been really motivating and inspiring for students. Students were able to explore and understand the types of satellite which are communication, Earth observation, navigation, Remote-sensing and many more satellites.

2. **Communication Satellites**

   Communication satellites transmit signals between the Earth and space, allowing people to communicate over long distances. They are used for television, radio, and telephone services.Around 24 GSAT are used for this purpose. The popular among them are GSAT-11(Heaviest Satellite) and GSAT-20( ).

Fig 1: GSAT - 11

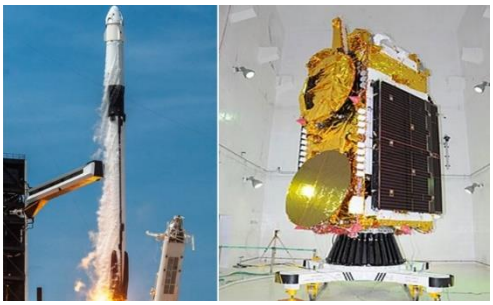

Fig 2: GSAT - 20

3. Earth Observation Satellites

Earth observation satellite is a satellite that monitors Earth from space. It uses sensors to gather information about the Earth's physical, chemical, and biological systems. There are around 22 operational satellites in Low Earth Orbit (LEO) and 29 in Geo-synchronous Earth Orbit (GEO).

Fig 3: EOS 4

4. Remote Sensing Satellite

Remote sensing is the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance. Special cameras collect remotely sensed images, which help researchers "sense" things about the Earth. India has multiple operational remote sensing satellites(INSAT and IRS), including satellites in sun-synchronous orbit(IRS) and geostationary orbit(INSAT).

Fig 4: IRS

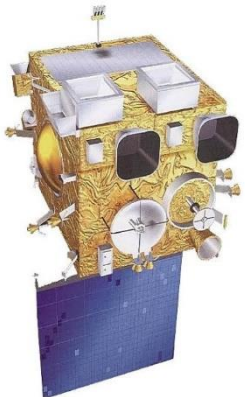

Fig 5: INSAT

5. Navigation satellite

A navigation satellite is a satellite that transmits radio signals to help users determine their location, speed, and time. These satellites are part of a global navigation satellite system (GNSS). According to ISRO, India currently has a constellation of seven navigation satellites in operation, known as the Indian Regional Navigation Satellite System (IRNSS) or NavIC.

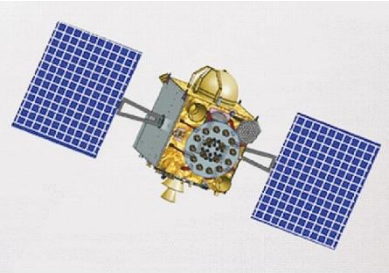

Fig 6: IRNSS

Fig 7: IRNSS

6. Evolution of components in space industry

(i) Solar Sail

A solar sail is a large, reflective surface that uses sunlight to propel a spacecraft. It's also known as a light sail or photon sail.

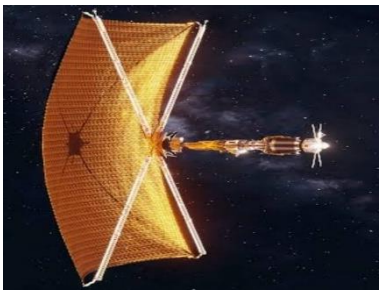

Fig 8: Solar Sail

(ii) Couplers

A coupler, or coupling, is a mechanical device that joins two objects or parts together. Couplers can be used to transmit power, reduce vibration, or compensate for misalignment.

Couplers used in space include fluid couplers, electrical couplers, data couplers, and directional couplers. These couplers are designed to handle extreme temperatures, vacuum conditions, and other challenges of space travel.

Fig 9: Couplers

(iii) Surface Acoustic Wave (SAW) system

A "Surface Acoustic Wave (SAW) system" is a technological setup that utilizes mechanical waves propagating along the surface of a piezoelectric material, typically generated and detected by interdigitated electrodes (IDTs), to perform functions like signal filtering, sensing, or actuation, where the wave's interaction with the surface is used to detect changes in mass, temperature, or other environmental parameters.

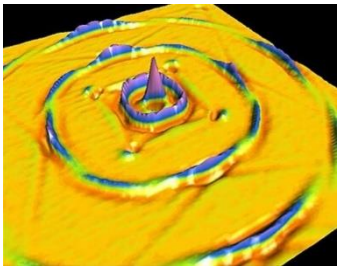

Fig 10: Surface Acoustic Wave observed on tellurium oxide

7. Chandrayan 3

Chandrayaan-3 is the third mission in the Chandra Yaan program, a series of lunar-exploration missions developed by the Indian Space Research Organization (ISRO).[11] The mission consists of a Vikram lunar lander and a Pragyan lunar rover was launched from Satish Dhawan Space Centre on 14 July 2023.

The spacecraft entered lunar orbit on 5 August, and India became the first country to touch down near the lunar south pole, at 69°S, the southernmost lunar landing [12] on 23 August 2023 at 18:04 IST (12:33 UTC), ISRO became the first agency to land near the south pole of the moon in its first attempt and over all the fourth space agency to successfully land on the Moon, after USSR, NASA and the CNSA.

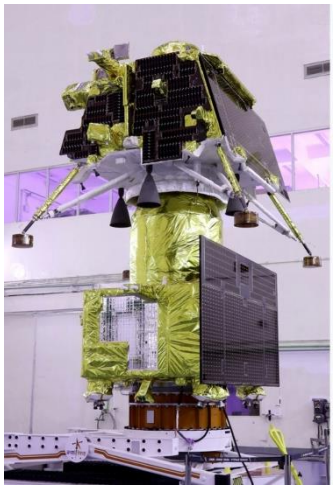

Fig 11: Chandra Yaan - 3 Integrated Module

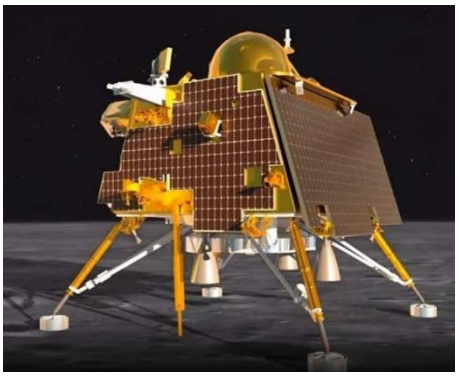

Fig 12: Chandra Yaan -

8. Upcoming projects of ISRO

- Gagan Yaan mission of ISRO will be launched in 2025. The Gagan Yaan mission's first uncrewed test flight, Gaganyaan-1, was originally scheduled for March 1, 2025. However, the launch has been delayed and is now expected to take place in 2026.
- In 2028, they are planning to launch Chandrayaan-4.
- In 2035, for first Indian space station, first module or block will be launched.

Objectives / key highlights:

- Students are gained the knowledge and able to develop space technology and its application to various national needs.
- Students were able to see the context of their learning in ISRO Advanced systems, where embedded systems are used in the designing of most of the space related products.
- Students gained the knowledge on the Embedded system applications in the field of space and its Engineering future.

Participant details:

- No. of participants in total:30
- Faculty – Shashikala H. C, Asst Professor,
  Shilpa M., Asst Professor.

Photos:


SPADEX-MAKING & DOCKING
URSC
Dept. of CSE
GPS Map Camera
Bengaluru, Karnataka, India
Blue Dart Express, Wind Tunnel Rd, Kaveri Nagar, Kodihalli, Bengaluru, Karnataka 560017, India
Lat 12.95968° Long 77.654297°
10/02/2025 01:41 PM GMT +05:30
Google


GPS Map Camera
Bengaluru, Karnataka, India
Xm63+mhm, Kodihalli, Bengaluru, Karnataka 560075, India
Lat 12.961529° Long 77.654275°
10/02/2025 01:32 PM GMT +05:30
Google

Outcomes/Benefits:

- Students were able to see the context of their learning in Indian Space Research Organization, where embedded systems are used in the designing of most of the space research related products.
- StudentsgainedtheknowledgeontheSatellitesystem applications in the field of space researchand itsEngineeringfuture.

Attachments:

1. CommunicationwithIndian Space Research Organization (URSC).
2. EvaluationandFeedback.

CO/PO&PSOmapping-CCE

CO/PO& PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Event (Industrial Visit)	-	02	-	-	02	02	-	-	02	02	-	02	02	02

PSO1: Tounderstandandapplytheconceptstodesignanddevelopsolutionsincomputer and communication Engineering.

PSO2: To use theinculcated experiential learning for research and developinventivesolutions for social benefit while ensuring securitywith moral values and ethics.

Shashikala H.C.	**Dr.ChandaV. Reddy**	**Dr.DilipKumarK**
EventCoordinator	Head- CCE	Principal,KSIT