

January 16, 2025

Industrial Visit Report

Mechanical/Mechatronics Engineering
Department



Location: U R Rao Satellite Centre(URSC), Bengaluru

Date of Visit: January 16, 2025

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Introduction

As part of our academic activity, visited the U R Rao Satellite Centre (URSC), Bengaluru, a pivotal establishment under the Indian Space Research Organisation (ISRO). This visit provided the students and faculties with invaluable insights into India's advancements in space technology and research. The following report summarizes the key highlights and learnings from the visit.



KEY LEARNINGS FROM THE VISIT

1. Gaganyaan Mission

The Gaganyaan Mission, an ambitious project by ISRO, aims to send humans into space. This monumental step in India's space exploration is focused on crew safety, utilizing advanced technologies and materials. We were briefed about the Human Rated Launch Vehicle (HRLV) designed specifically for this mission.

2. Aditya L1 Mission and Lagrange Point

The Aditya L1 Mission intends to study the Sun and its corona by placing the satellite at Lagrange

Point 1 (L1), located approximately 1.5 million kilometers from Earth. This strategic position allows continuous observation of the Sun. Additionally, we learned about other Lagrange Points (L2 to L5) and their respective roles in space exploration.

3. Chandrayaan Missions

- Chandrayaan-3: Observing a full-scale prototype of Chandrayaan-3 was an enlightening experience, showcasing its design and objectives.

- **Chandrayaan-4 and Chandrayaan-5:** ISRO's future missions include collecting lunar soil samples and returning them to Earth. Chandrayaan-5 has already received approval and funding, signaling significant progress.
- **Future Plans:** ISRO's roadmap for the Chandrayaan series extends up to Chandrayaan- 10, with plans for a manned mission to the Moon.

4.Lander Components of Chandrayaan Missions

Explored various intricate components of the Chandrayaan landers, including:

- RAMBHA: Studies the lunar ionosphere's plasma density and its variations.
- ILSA: Detects and analyzes seismic activity on the Moon.
- LRA: Measures precise distances between Earth and the Moon using laser reflections.
- CHASTE: Monitors temperature variations on the Moon's surface.
- VATI: Facilitates detailed mapping and analysis of the lunar terrain.

5.Satellite Launch Demonstration

A live demonstration of satellite deployment from a rocket post-launch provided us with a deeper understanding of the complex processes involved.

6.Remote Sensing and Communication Satellites

Remote sensing satellites are essential for weather forecasting, agriculture, and disaster management, while communication satellites support telecommunication, television broadcasting, and internet services.

7.NASA-ISRO SyntheticAperture Radar (NISAR)Mission

This collaborative mission between NASA and ISRO will significantly enhance Earth observation capabilities, contributing to disaster management and environmental research.

8.Bharatiya Antariksha Station (BAS)

ISRO's plan to establish the Bharatiya Antariksha Station by 2035 aims to support long- term scientific research in orbit, further solidifying India's leadership in space exploration.

9.ISRO's Main Branches

The organizational structure of ISRO was explained, focusing on its three main branches:

- Vikram Sarabhai Space Centre (VSSC):Responsible for rocket development, including PSLV, GSLV, and RSLVs located at Thiruvananthapuram, Kerala, India.
- Satish Dhawan Space Centre(SDSC) SHAR: Handles integration and launches Located at Sriharikota, Tirupati district, Andhra Pradesh, India.
- U R Rao Satellite Centre (URSC): Specializes in the design and manufacturing of satellites and their components Located at Located at Bengaluru, Karnataka, India.

Conclusion

The visit to the U R Rao Satellite Centre was an enlightening experience that offered a glimpse into ISRO's cutting-edge technologies and ambitious projects. It instilled a sense of pride and inspiration among the students, encouraging them to contribute to India's future space endeavors.

Acknowledgment

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