



BVRIT HYDERABAD College of Engineering for Women

(UGC Autonomous Institution | Approved by ACITE | Affiliated to JNTUH)
NAAC Accredited – A Grade | NBA Accredited B.Tech. (EEE, ECE, CSE and IT)
Bachupally, Hyderabad -500 090

Report on Visit to the Laboratory of Electro Optical Systems, ISRO Bangalore

Date of Visit: 07-06-2024

Location: ISRO Bangalore

Attendees: A group of 30 Students from BVRITH & 3 faculty

Faculty: Dr K Vamshi Krishna Varma, Associate Director, SVES

Dr V Santhosh Kumar, Associate Professor, BVRITH

Mrs. T Amy Prasanna, Assistant Professor, BVRITH

Overview:

On 7th June 2024, a group of 30 students accompanied by 3 faculty members had the privilege of visiting the Laboratory of Electro Optical Systems at ISRO Bangalore. The visit provided an invaluable opportunity to gain insights into various facets of electro-optical systems and their applications in space technology.

Highlights of the Visit:

1. Optics Lab:

- Students were introduced to the fundamentals of optics and its significance in space technology.
- Explored various optical instruments such as lenses, mirrors, and prisms. They observed how light behaves when passing through different mediums and learned about the principles behind lens focusing and light refraction.
- Witnessed demonstrations showcasing the practical applications of optics in space missions, including how optical systems are used for imaging, communication, and remote sensing.

2. MTF Lab (Modulation Transfer Function):

- Explored the concept of Modulation Transfer Function and its role in assessing image quality.

- Participated in a demonstration where they observed how MTF is measured using specialized equipment. They analyzed sample images to understand how MTF values correlate with image sharpness and contrast.
- Learned about the importance of MTF in designing optical systems for space missions, where high-resolution imaging is crucial for scientific research and satellite imaging.

3. New High Bay Area Lab (Mirror Testing):

- Witnessed cutting-edge mirror testing techniques used in space telescope development.
- Participated in a guided tour of the lab, where they observed the setup used for mirror testing. They learned about the precision required for space-grade mirrors and how deviations in mirror quality can affect imaging performance.
- Explored the challenges involved in mirror testing for large space telescopes and how advanced technologies are employed to overcome these challenges, ensuring accurate imaging capabilities in space.

4. Earth Orientation Lab:

- Learned about the importance of accurately determining Earth's orientation in space missions.
- Engaged in discussions with engineers, and experts about the methods and instruments used for Earth orientation measurements. They observed demonstration setups illustrating how data from gyroscopes and star trackers are used to calculate Earth's orientation in space.
- Explored the role of Earth orientation measurements in spacecraft navigation, satellite communication, and remote sensing applications, highlighting the critical need for precise orientation data for mission success.

5. Sun Sensor Lab:

- Explored the role of sun sensors in spacecraft navigation and orientation.
- Engaged in discussions and demonstrations led by experts on the principles behind sun sensor operation and calibration processes. They observed simulations demonstrating how sun sensors aid in spacecraft attitude control during different mission phases.
- Learned about the challenges of navigating in space using celestial references and how sun sensors provide essential data for spacecraft orientation, ensuring accurate positioning and maneuvering during missions.

6. Thermo Vacuum Facilities:

- Explored the Thermal Vacuum Lab, which simulates the harsh conditions of space.
- Witnessed demonstrations on how spacecraft and instruments are tested under extreme temperature and pressure conditions.
- Learned about the importance of thermal vacuum testing in ensuring the reliability and functionality of space equipment in the harsh environment of space.

Guided by Experts:

The visit was facilitated by Shaila, the manager of the laboratory, and Laxmi from the HR department. Additionally, students had the opportunity to interact with research scholars and engineers, who provided valuable insights and answered questions about ongoing projects and research endeavors.

Conclusion:

The visit to the Laboratory of Electro Optical Systems at ISRO Bangalore was an enlightening experience for the students, providing them with valuable insights into cutting-edge technologies and research in the field of electro-optical systems. While there were no hands-on experiences, the guided tours, demonstrations, and discussions with research scholars offered a comprehensive understanding of the complexities involved in space technology development and highlighted the critical role of optics in space exploration.

***No Photographs allowed in this visit**



Dr. V. Santhosh Kumar



Dr. Anwar Bhasha Pattan
HoD-ECE