

SATLAB



Student Convenor :
Vansh Sharma

Advancing Satellite Technology

Faculty In-charge:
Dr. Anurag Aeron



Satlab is a **student-run central facility** at **Meerut Institute of Engineering and Technology**, established in **2018** by a group of students from multiple disciplines to advance research and development in **space technologies**. Their primary project involved constructing and launching a CubeSat, a type of miniaturized satellite used for space research.

- **CubeSat Projects:** Design, build, and launch CubeSats to contribute to space research and provide practical experience for students.
- **Research and Development:** Conduct cutting-edge research in space technologies and develop innovative solutions for space exploration and satellite technology.
- **Interdisciplinary Collaboration:** Foster collaboration among students from various disciplines to enhance learning and innovation in space technology projects.
- **Educational Outreach:** Organize workshops, seminars, and courses to educate and inspire the next generation of engineers and scientists in the field of space technology.
- **Industry Partnerships:** Establish partnerships with industry leaders and space agencies to gain support, share knowledge, and provide students with real-world experience.

S. No.	Name	Sem / Branch / Section
1	Aaryan Pal	8/CSE/A
2	Shivam Jain	8/ECE
3	Harsh Singhal	8/ME
4	Harsh Vardhan Dixit	8/IT
5	Praful Jain	8/IT
6	Sarang Gupta	8/CSE
7	Navneet Kumar	8/ME
8	Yash Kansal	8/CSE
9	Anjali Singh	6/CSE
10	Riya Chaudhary	6/CSE
11	Arpit Nehra	6/CSE
12	Abhinav Chauhan	6/CS-IOT
13	Pratham Bansal	6/CS-AIML
14	Nikhil Kumar	6/CSE
15	Deepak Sharma	6/EE
16	Himanshu Giri	6/ME
17	Vansh Sharma	6/CSE

We are planning to work on the following projects. These are the sub-projects related to CubeSat, as these projects will help to develop units of each subsystem. The projects will be designed in such a way that is easily integrated into the CubeSat later.

- Data Acquisition (DAQ)
- Single Axis Control
- Attitude Determination Kalman Filter
- Solar Energy Harvester
- AM Transmitter and Receiver



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Dear Dr Rajendra,

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S. No	YEAR	ACTIVITIES
1	2018	SATLAB was founded on 3 June 2018
2	2018	Built a 1U cubeSat structure from scratch.
3	2018	Developed a Yagi-uda antenna-based satellite ground station.
4	2019	Team Pathik won 1st prize in the National Level Hackathon Tekno
5	2019	Students from Team Pathik attended a workshop on a small satellite from IIRS Dehradun.
6	2020	Learned about the Drone technology
7		Built the first drone of MIET

S. No	YEAR	ACTIVITIES
8	2021	Organized Orientation session for 2020 batch hiring
9		Two projects from Team Pathik won 2nd and 3rd prizes in INDEATHON conducted at MIET.
10		Developed an autonomous drone for agriculture applications.
11	2022	Organized a 1-day workshop hand-on workshop on drone
12		Organized a 5-day workshop in collaboration with TIHAN IIIT-HYDERABAD .
13		Conducted a seminar on CubeSat and space for polytechnic students.
14		Team Pathik participated in CANSAT INDIA 2022 and presented PDR . Successfully cleared the first round .

S. No	YEAR	ACTIVITIES
15	2023	Team Pathik presented CDR (Critical Design Review) for the Cansat-India competition. Successfully cleared the second round .
16	2023	In-SPACe director, Dr. Vinod Kumar , visited SATLAB in April 2023 to inspect the Cansat progress evaluation..
17	2024	Team Pathik presented PFR (Pre-Flight Review) for the Cansat-India competition. Successfully cleared the third round .
18		Cansat was launched on 16 April 2024 in Ahmedabad, Gujarat. Cansat achieved its functionalities and all the systems were working fine.
19		Team Pathik from SATLAB was awarded certificates from ISRO chairman, S. Somnath.

A regular day at SATLAB involving brain storming sessions with team members and our hounerable guides



On April 30 2023, the **Director of IN-SPACE**, **Dr. Vinod Kumar**, visited our lab to inspect the progress of our CANSAT project.





PCB Designing Workshop



3D Designing Workshop



Onboard Computer PCB



2-Axis IMU Test Bed



RSSI Monitor



Descent Parachute



CANSAT MISSION





Dr. Anurag Aeron,
Faculty In-Charge,
SAT Lab, with
Shri S. Somanath ji,
Chairman ISRO/
Secretary
Department of Space

Space Tourism: An commercial opportunity

- Space tourism is a booming business prospect
- Since 2001, 51 persons travelled as Tourist nauts in 18 missions

Target cost/seat: 100,000 \$

Aviation sector v/s Space Tourism

Year	Aviation sector (Billion \$)	Space Tourism sector (Billion \$)
2004	379	~424
2020	872	~1444

Prospects

Areas

- Transportation
- Recreation

Technological goals

- Hypersonic planes
- Suborbital, Orbital capsules

Technology Support & International collaborations

Challenges

- Training of Touris-nauts
- Crew Safety
- Crew comfort & ergonomics
- Liabilities
- Authorisation

Space tourism module

- Fully composite module
- Experiencing zero g by passengers
- Retro propulsion & landing
- Robust escape systems
- Launch on demand
- Recovery & re-use technologies

Vehicle with Space tourism module

L40 stage with Interstage, CM with Escape Module (EM)

- A 1U CubeSat structure is designed from scratch with Analysis.
- A fully functional CANSAT was successfully developed and integrated with all its subsystems. The CANSAT is designed to be deployed at an altitude of 900m. The development process involved testing and validation to ensure the CANSAT meets mission requirements.

- Certificate of participation from the Indian Institute of Remote Sensing (IIRS, Dehradun) in Hyperspectral Imaging Training.



- Two students (**Shubham Main, and Saurabh Gururani**) and Two faculty (**Dr. Pramod Singh, and Mr. Masood Anzar**) were selected for the international course on a small satellite mission conducted by IIRS Dehradun



- Students from sat lab have qualified for e-yantra for both **2018-19** and **2019-20** (Ram Verma, Rachit Jain, Sanyam Sharma, Shivang Sharma, Anurag Sahu, Abhishek Bhai Patel, Prashant Kumar, Ramanand Gupta)



- Various visits to USAC, IIRS, and ITDA have discussed our ideas with scientists of ISRO



Vice Chairman of MIET and Founder of SATLAB discussing with the scientist of ISRO

- One member of team pathik got selected among 60 delegates for the workshop on communication and navigation for Artemis mission at NASA (Ishita Sharma)
- Student of satlab was the winner of national level hackathon at rec Bijnor with the project water monitoring system (Ritanshi Agarwal, Anurag Sahu, Abhishek Bhai Patel, and Ramanand Gupta)
- Various visit in USAC , IIRS , ITDA and have discussed our ideas with scientists of ISRO.
- selected to work in the space law and policy with the united nations organization of the space generation advisory Council (Ishita sharma)



RITANSHI AGARWAL

SATLAB member selected in MS in
Communication Engineering program at
Technical University of Munich, Germany



ISHITA SHARMA

SATLAB member worked in space law and
policy with united nations organization

- Certificate received from IN-SPACe for the CANSAT India competition 2022.



- PCB Designing and Prototyping
- 3D Designing and Modeling
- Embedded software development

TEAM PATHIK participated in CANSAT INDIA



THANK YOU