



INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DHARWAD

TEAM ICARUS | 4TH PLACE | ₹2 LAKH PRIZE

ISRO Robotics Challenge - URSC 2026

~590

REGISTERED TEAMS

20

FINALISTS

21-23 JUL

FINAL ROUND 2026

4TH

NATIONAL PLACEMENT

THE NATIONAL CHALLENGE AND ITS SIGNIFICANCE

Organised by the U R Rao Satellite Centre (URSC) of the Indian Space Research Organisation (ISRO), IRoC-U 2026 was the third edition of a national student robotics competition. Its theme, "Towards Swarm Expedition: Autonomous Surveyor Challenge for Exploration, Navigation and Dynamics (ASCEND)", sought autonomous robotic capabilities relevant to future planetary exploration, including Mars missions. The competition attracted nearly 590 registered teams, of which only 20 reached the final field round at URSC, Bengaluru, held from 21 to 23 July 2026.

WHAT THE TEAMS WERE CHALLENGED TO BUILD

Teams were tasked with developing a micro-unmanned aerial vehicle (UAV) and base station capable of autonomous operation without GPS/GNSS or other external navigation aids. The UAV had to search a designated arena for seeded visual features, record detection images and local coordinates, return and land at its base station, transfer observations for automated validation, and recharge for subsequent sorties. The challenge therefore combined autonomous navigation, computer vision, embedded systems, control, data transfer and power management.

TEAM ICARUS: THE JOURNEY FROM FIRST FLIGHT TO THE FINALS

The journey began in December, when seven students from IIIT Dharwad came together as Team Icarus under the mentorship of Prof. Mallikarjun Kande, with Jayesh Patil leading the team. The team comprised Jayesh Patil (Team Lead, 3rd-year CSE), Aswin Joseph Sunny (1st-year ECE), Priyanshu Mittal (2nd-year CSE), Ankit Dash (2nd-year CSE), Raskin Verma (2nd-year CSE), Muhammad Rehan (1st-year DSAI), and Saksham (1st-year CSE). None of the team members had a substantial background in robotics, making the competition a completely new experience for them. Under the guidance of Prof. Mallikarjun Kande and the leadership of Jayesh, the team began by understanding the problem statement, researching possible solutions, identifying suitable components, and developing a feasible technical approach. What started as an unfamiliar challenge gradually became a shared effort involving design, implementation, and testing.

The team's primary focus was on developing an autonomous aerial vehicle and a base station. Initially, getting the drone to fly stably without significant drift was a challenge in itself. Even after achieving flight, understanding its behaviour and establishing reliable control required considerable effort. The team had to familiarise itself with the hardware, flight control, navigation, and integration of different subsystems. As it progressed through the preliminary and qualification rounds, the team continued refining its approach,

addressing limitations, and improving its understanding of the system. Qualifying for the subsequent stages was a proud moment that motivated the members to work harder and strengthened their determination to perform well.

Preparing for the elimination round required extensive work beyond developing the drone itself. The team built a testing arena to simulate the competition environment and evaluate the system under conditions closer to those expected during the evaluation. It also worked on tuning its AI model to improve instance detection and refine its performance. Alongside these efforts, the team conducted repeated flight tests, identified points of failure, improved system robustness, and made necessary hardware and software adjustments. Developing the autonomous drone and charging setup in parallel added to the complexity, as each subsystem had to be tested and integrated carefully. The process involved failures, troubleshooting, and verification, often requiring the team to revisit earlier decisions. One of the most stressful experiences occurred when the drone crashed shortly before the ISRO scientists arrived to evaluate the team's work. The timing made the situation particularly challenging, but it reinforced the importance of systematic troubleshooting, adaptability, and teamwork under pressure.

Reaching the final round in Bengaluru in July was a significant milestone for Team Icarus. The competition arena was entirely different from what the team had anticipated, requiring its members to adapt their approach to the actual conditions. Despite this, the team performed well in instance detection and was among the few teams that could detect all the instances in the challenge. This achievement reflected the effort invested in developing and refining the system. The final round also provided valuable exposure to the practical demands of a national-level competition and demonstrated the importance of adapting engineering solutions to real evaluation environments.

beginning. Since the team members were new to drone technology, his support was invaluable in helping them navigate unfamiliar concepts and technical challenges. The team also expresses its sincere gratitude to Prof. Mahadeva Prasanna, Director of IIIT Dharwad, for his continuous encouragement and financial support, which enabled the students to pursue this opportunity and represent the institute. The team acknowledges the support of everyone at IIIT Dharwad who contributed to its participation and progress.

On National Space Day, 23 August 2026, Team Icarus received a consolation prize, securing fourth place nationally and a cash award of Rs. 2 lakh, an honour that made the entire journey even more memorable. From beginning with very little experience in robotics in December to reaching the finals in July and receiving recognition at the national level, the experience was a significant achievement for the entire team.

OUTCOME AND LASTING IMPACT

Looking back, IROc-U 2026 was much more than a competition for Team Icarus. It was a journey of learning, experimentation, setbacks, and teamwork. From the first attempts at flying a drone to building a testing arena, tuning the AI model, and adapting to the final competition environment, every stage provided valuable lessons in engineering and perseverance. The experience strengthened the team's technical understanding, problem-solving abilities, and capacity to work together under challenging conditions. Team Icarus's fourth-prize finish stands as a significant milestone in the students' engineering journey and in their representation of IIIT Dharwad.