

Sky is not the limit with Project Apeiro

Project Apeiro, India's first student-led micro-satellite, an experiment by undergraduate students from BITS Pilani K K Birla Goa Campus was launched from Tata Institute of Fundamental Research (TIFR) Balloon Facility, ECIL, Hyderabad, Telangana on February 2, 2018. The Project Apeiro team consists of students from different disciplines and each had different aspects in the project discussion. **NT KURIO CITY** speaks to some of the team members and finds more details about their project



Shivangi Kamat, Sanket Deshpande, Lucky Kapoor holding the detector assembly along with collaborators from TIFR Mumbai

RAMANDEEP KAUR | NT KURIO CITY

We have all heard about satellites being launched into space but have you ever heard it being launched by our students? Well, Project Apeiro is one such venture led by undergraduate students from BITS Pilani (Goa): Lucky Kapoor, Shivangi Kamat, Vibhav Joshi, Pankaj Tiple and team leader

Sanket Deshpande. From TIFR, B Satyanarayana has mentored the project while from BITS Pilani, professors Toby Joseph and Dipankar Pal have been the project advisors.

Project Apeiro aims to determine cosmic radiation flux in the lower stratospheric regions of the earth's atmosphere over the Indian subcontinent. This radiation is known to cause cancer. This study will help to determine radiation exposure risks to aviation

and space flight crews. The experiment was performed by deploying a cosmic radiation detector at altitudes of 24 and 26 kilometers above sea level using High Altitude Ballooning (HAB). The payload was launched from the TIFR Balloon Facility in Hyderabad on February 2, 2018.

Sanket, a fourth year student pursuing majors in Physics and Electrical and Electronics Engineering has been working on this project for over the past three years now. He

says that the data collected from this flight will be analysed and compared with the predictions of the NAIRAS model, recently developed by NASA for this purpose. The detector and other instrumentation were developed in collaboration with the Tata Institute of Fundamental Research (TIFR), Mumbai. This venture also happens to be India's first student-led near-space experiment. He joined BITS Pilani in 2014 and was enthusiastic to work on a space

engineering project, but had an almost negligible knowledge and experience in the subject. Sanket says: "Srihari Menon, a fourth-year student then (now working at University of Pennsylvania, USA), was ideating with his colleagues about a possible near-space flight. While the problem statement was different, I was introduced to the concept of near-space exploration using 'high altitude ballooning' by him. This technique is much cheaper and easier compared to rocket-borne flights and hence seemed like a feasible idea." He adds that they started working on this idea and eventually gathered a team and developed collaboration with TIFR for support in terms of technical expertise and prototyping and testing facilities. While Srihari could not be directly involved with the project, he has been helping as an advisor.

Sharing his experience while working on the project, fourth year undergraduate student Lucky pursuing a five-year dual degree integrated program (MSc in Physics and BE in Electrical and Electronics Engineering) says: "When we started this project, we were just first year students who did not know much about working on real life problems. Apart from all the technical aspects, this project has taught me a lot about time management and how to balance working on a big project with academics."

And since it is India's first student-led micro satellite, Lucky says that it was exciting to work on a goal, never accomplished before. He adds that even though experiments with similar scientific aim have been pursued before, the important part is that they were just a student team, who in the beginning did not know some of the

fundamental concepts. About the project's USP, Lucky says that it focuses on a key factor that will determine the future of travelling across the globe and even for inter-planetary travel. "With the increase in number of people opting to travel by air, there is a necessity to understand the harmful effects of spending a large amount of time away from the safety blanket of our atmosphere. Soon we will be flying at higher altitudes; the data collected from our project will help in determining the safety precautions needed for the future of air travel and space travel."

Another team member is fifth-year dual degree student Shivangi Kamat, majoring in Physics and Electronics and is cur-

rently doing her thesis research at CERN, Geneva. She informs that the project was started in the SEDS Celestia Club a few years ago by seniors. "I joined the project in 2016, working majorly on the embedded system and integrating several sensors in the payload," says Shivangi. During the making of the project, they would research about basics of pulse detection and filtering, but as the project progressed, the team learnt several things on the way and refined their knowledge in several topics related to physics, electronics and mechanics.

Through their project, the team also aims to motivate young minds towards science and research by encouraging them to take up such projects during college years.

TIDBITS

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