

INDIA'S FIRST STUDENT-LED MICRO-SATELLITE

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While one of the most watched live streamed events in February was that of Elon Musk launching his own Tesla Roadster on SpaceX's first Falcon Heavy rocket, a group of students from BITS Pilani K K Birla campus were live streaming the launch of their near-space micro satellite. India's first student-led micro-satellite was launched from Tata Institute of Fundamental Research (TIFR) Balloon Facility, Hyderabad, Telangana earlier this month. Project Apeiro is an experiment led by undergraduate students from BITS Pilani K K Birla Goa Campus. The experiment aimed to detect and measure cosmic radiation in the stratosphere.

"This study is important to understand the biologically harmful cosmic radiation incident on earth from outer space. Extended exposure to this radiation leads to an increased risk in cancer and tissue damage. Hence, a thorough understanding of this radiation is essential to develop predictive and preventive mechanisms against their impact," said student member Lucky Kapoor.

Kapoor was joined by fellow students Sanket Deshpande, Shivangi Kamat, Vibhav Joshi and Pankaj Tiple from BITS Pilani K K Birla Goa Campus. The student team project mentor was Dr B Satyanarayana, Scientific Officer (H), TIFR Mumbai.

The experiment was conducted using the technique of High Altitude Ballooning. This method allows studies



Working together: The launch of the micro satellite and (inset) the team behind Project Apeiro

in the near-space environment with the help of a zero-pressure plastic balloon that lifts the experimental payload to desired altitude. The experimental payload consisted of a cosmic radiation



detector made with a combination of scintillator and photomultiplier tubes. This detector system was supported by an on-board high and low voltage power supply system along with data acquisition systems. The development of the detector system was completed at TIFR, Mumbai.

The flight for this payload was conducted from the TIFR Balloon

Facility in Hyderabad, Telangana which is amongst a very few institutes from around the world capable of supporting such kind of a flight. The balloon and all other flight equipment required for the flight of the Project Apeiro-payload were completely developed at this facility. The payload was launched at 2:12 am on February 2, 2018 and achieved a first float altitude at 24.8 km. The second float altitude was achieved at 26.7 km. The flight was terminated at 5:17 am on the same day. All flight control and experiment equipment were recovered successfully without any damage.

This flight sets history by successfully completing the country's first near-space experiment completely developed by students.

"Special thanks to Prof Devendra Ojha, Chairperson, TIFR Balloon Facility, Hyderabad, Telangana, Suneel Kumar, Scientist-in-Charge, TIFR Balloon Facility, Hyderabad, Telangana, all TIFR Balloon Facility Staff and Srihari Menon, University of Pennsylvania, USA," added Kapoor.

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