

Understudies satellite by Institutions from India

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Abstract

ISRO has influenced educational institutions by its activities like making satellites for communication, remote sensing and astronomy. The launch of Chandrayaan-1 has increased the interest of universities and institutions towards making experimental student satellites. Capable Universities and institution can venture into space technology on-orbit with guidance and support from ISRO in following ways.

I. SATELLITE DESIGN & FABRICATION BY UNIVERSITIES/INSTITUTIONS

Under this option Universities have to design, fabricate, test the satellite Bus & Payload and deliver the integrated spacecraft for launch. Technical guidance in designing, fabrication and testing will be provided by ISRO. Some critical materials for the space mission also will be provided by ISRO. The designs and test results will be reviewed by ISRO team. Under this option more than one University/Institution may participate. One among them will be the focal point for the ISRO. After launch, the collected data will be archived and disseminated by university/Institution(s).

II. DEVELOPMENT OF PAYLOAD (BY UNIVERSITIES/INSTITUTIONS)

Every satellite carries a payload that performs the intended function to achieve the mission goal and the main bus that supports the payload function. The Development of payloads may comprise of detectors, electronics and associated algorithms, which can be an experimental piggy bank payload on the ISRO's on-going (Small or operational) satellite projects.

Design and development of detectors, payload electronics, and associated algorithm / experiments that enhance the application of space services to mankind is a continuing R&D activity in several educational institutions all over the world. Educational institutions can propose the payloads developed by them to be flown on ISRO's small satellites. Under this option, payload only is developed by the Universities or Institutions and launched with ISROs satellite missions which has other ISRO's payloads. Data Handling and data transmission is done by ISRO as the part of satellite bus. After launch ISRO will acquire payload data and disseminate it to Universities/ institutions further processing and analysis.

Indian Space Research Organization (ISRO) has given many educational institutions a chance to venture into space technology by guiding students towards making experimental satellites. Since 2009, the student satellites which have been launched by ISRO are briefed below.

SN	Name	Launch Date	Launch Mass	Launch Vehicle
1	<u>ANUSAT</u>	Apr 20, 2009	40 kg	<u>PSLV-C12 / RISAT-2</u>
2	<u>STUDSAT</u>	Jul 12, 2010	Less than 1 kg	<u>PSLV-C15/CARTOSAT-2B</u>
3	<u>SRMSat</u>	Oct 12, 2011	10.9 kg	<u>PSLV-C18/Megha-Tropiques</u>
4	<u>JUGNU</u>	Oct 12, 2011	3 kg	<u>PSLV-C18/Megha-Tropiques</u>
5	<u>SWAYAM</u>	Jun 22, 2016	1kg	<u>PSLV-C34 / CARTOSAT-2 Series Satellit</u>
6	<u>SATHYABAMASAT</u>	Jun 22, 2016	1.5 kg	<u>PSLV-C34 / CARTOSAT-2 Series Satellite</u>
7	<u>PRATHAM</u>	Sep 26, 2016	10 kg	<u>PSLV-C35 / SCATSAT-1</u>
8	<u>PISAT</u>	Sep 26, 2016	5.25 kg	<u>PSLV-C35 / SCATSAT-1</u>
9	<u>NIUSAT</u>	Jun 23, 2017	15 kg	<u>PSLV-C38 / Cartosat-2 Series Satellite</u>
10	<u>Kalamsat-V2</u>	Jan 24, 2019	1.26 kg	<u>PSLV-C44</u>

Kalamsat-V2, a student payload is first to use fourth stage (PS4) of the PSLV as an orbital platform. The satellite was taken to its designated orbit by PSLV-C44.

NIUSAT is an Indian University/Academic Institute satellite from NoorulIslam University in Tamil Nadu State, launched by PSLV-C38. This 15 kg three axis stabilised satellite is built to provide multispectral imagery for agricultural crop monitoring and disaster management support applications.

PISAT: Satellite from PES University, Bengaluru and its consortium

PRATHAM: Developed by Indian Institute of Technology Mumbai,

SATHYABAMASAT: Developed by Sathyabama University, Chennai.

SWAYAM: Developed by College of Engineering, Pune

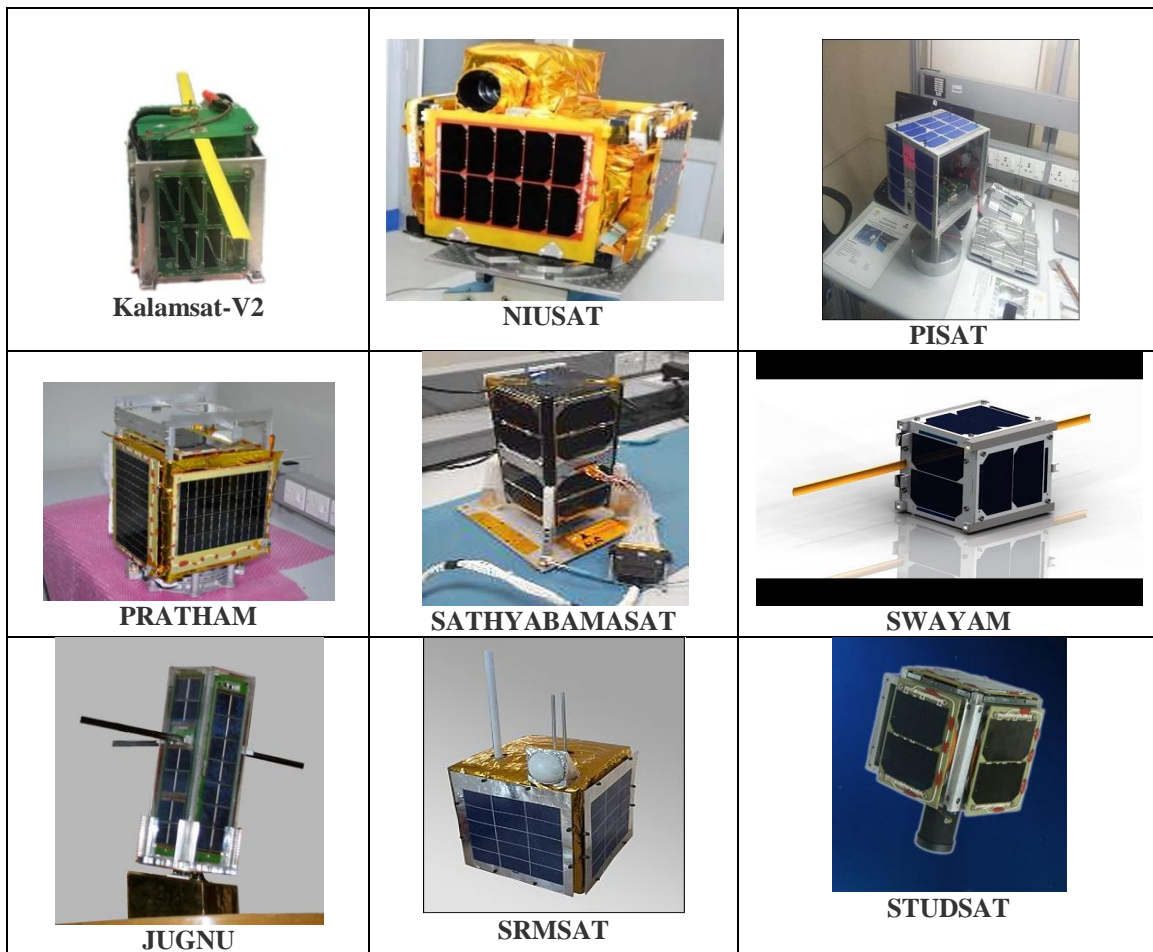
JUGNU: Developed by IIT, Kanpur

SRMSAT: Developed nanosatellite of SRM (Sri Ramaswamy Memorial) University, Chennai,

STUDSAT: Developed by a consortium of seven engineering colleges from Karnataka and Andhra Pradesh.

- NitteMeenakshi Institute of Technology, Bangalore.[Lead College]
- M S Ramaiah Institute of Technology, Bangalore.
- Rashtreeya Vidyalaya College of Engineering, Bangalore.
- B M S Institute of Technology, Bangalore.
- ChaitanyaBharathi Institute of Technology, Hyderabad
- Vignan Institute of Technology & Science, Hyderabad.
- RNS Institute of Technology, Bangalore.

ANUSAT (Anna University Satellite) is the first satellite built by an Indian University under the overall guidance of ISRO and will demonstrate the technologies related to message store and forward operations.



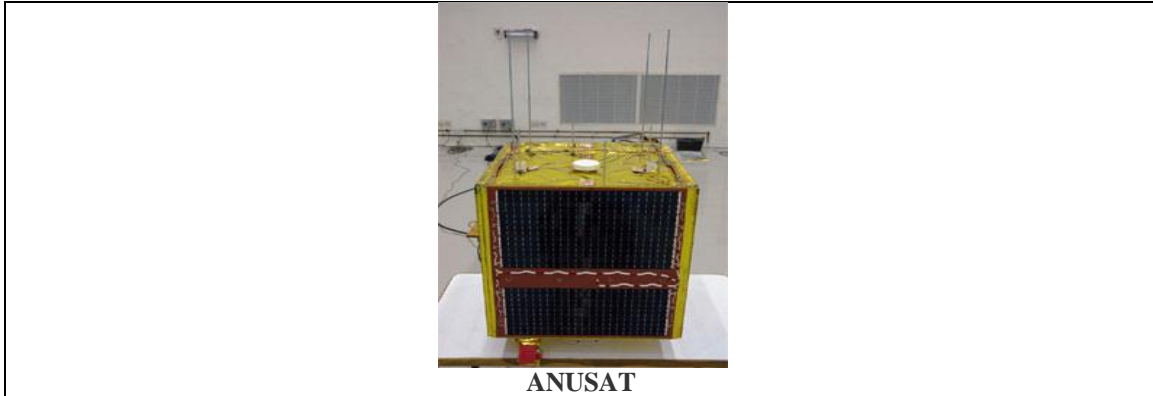


Fig 1: Students satellite of various institutions

Benefits of launching a satellite by an institute

The mission's objective for students and faculty is to have a hands-on experience with the design, fabrication and realization of a space mission at a minimum cost. It will encourage research by establishing a communication link between the satellite and ground station.

REFERENCE:

- [1]. <https://www.isro.gov.in/spacecraft/list-of-university-academic-institute-satellites>