

# YOUTHSAT

YOUTHSAT is a joint Indo-Russian stellar and atmospheric satellite mission with the participation of students from Universities at graduate, post graduate and research scholar level. With a lift-off mass of 92 kg, Youthsat is a mini satellite and the second in the Indian Mini Satellite (IMS) series. Youthsat mission intends to investigate the relationship between solar variability and thermosphere-Ionosphere changes. The satellite carries three payloads, of which two are Indian and one Russian. Together, they form a unique and comprehensive package of experiments for the investigation of the composition, energetics and dynamics of earth's upper atmosphere.

The Indian payloads are:

1. **RaBIT** (Radio Beacon for Ionospheric Tomography)- For mapping Total Electron Content (TEC) of the Ionosphere.
2. **LiVHySI** (Limb Viewing Hyper Spectral Imager) - To perform airglow measurements of the Earth's upper atmosphere (80- 600 km) in 450-950 nm.

The Russian payload

**SOLRAD** - To study temporal and spectral parameters of solar flare X and gamma ray fluxes as well as charge particles in the earth polar cap regions.

|                             |                                                                                                                                         |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Lift-off Mass               | 92 kg                                                                                                                                   |
| Orbit Period                | 101.35 min                                                                                                                              |
| Dimension                   | 1020 (Pitch) x 604 (Roll) x 1340 (Yaw) mm <sup>3</sup>                                                                                  |
| Attitude and Orbit Control  | 3-axis body stabilised using Sun and Star Sensors, Miniature Magnetometer, Miniature Gyros, Micro Reaction Wheels and Magnetic Torquers |
| Power                       | Solar Array generating 230 W, one 10.5 AH Li-ion battery                                                                                |
| Mechanisms                  | Paraffin Actuator based Solar Panel Hold Down and Release Mechanism                                                                     |
| Launch date                 | April 20, 2011                                                                                                                          |
| Launch site                 | SHAR Centre Sriharikota India                                                                                                           |
| Launch vehicle              | PSLV- C16                                                                                                                               |
| Orbit                       | Circular Polar Sun Synchronous                                                                                                          |
| Orbit altitude at injection | 822 km $\pm$ 20 km (3 Sigma)                                                                                                            |
| Orbit Inclination           | 98.731 ° $\pm$ 0.2 °                                                                                                                    |
| Mission life                | 2 years                                                                                                                                 |