

# PSLV-C3 / Technology Experiment Satellite (TES) Mission

22 October, 2001

## THE MISSION

PSLV-C3 carrying on-board the Technology Experiment Satellite (TES) lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 10.23 AM (IST) on October 22, 2001. While TES and BIRD (Bispectral and Infrared Remote Detection) satellites were placed in the 568 km Sun-synchronous Orbit, PROBA (Project for On Board Autonomy) was placed in an elliptical orbit with a perigee (nearest to Earth) of 568 km and an apogee (farthest to the Earth) of 638 km. The higher orbit for PROBA was achieved by firing the reaction control thrusters of PSLV-C3 fourth stage. With the successful launch of three satellites simultaneously for the second time, ISRO's PSLV has proved itself as a promising vehicle with prospects for commercial launching of satellites even while serving its primary goal of launching Indian Remote Sensing Satellites.



## PSLV - C 3

### THE LAUNCH VEHICLE

PSLV-C3 is the 6<sup>th</sup> flight of ISRO's Polar Satellite Launch Vehicle. PSLV-C3 lifted-off with the ignition of the core first stage and four strap-on motors, the remaining two strap-on motors of the first stage were ignited at 25 seconds after lift-off. After going through the planned flight events including the separation of the ground-lit strap-on motors, the air lit strap-on motors and first stage separation, the ignition of the second stage, separation of the heat shield after the vehicle had cleared the dense atmosphere, third stage ignition, third stage separation, fourth stage ignition and fourth stage cut-off, the satellites were systematically injected into the orbit as per plan.

In its present configuration, the 44.4 metre tall, 294 tonne PSLV has four stages using solid and liquid propulsion systems alternately. A few improvements had been carried out in the PSLV-C3 compared to PSLV-C2. They included introduction of lightweight fourth stage (PS4) tank for better vehicle performance and ball-lock separation system for the separation of auxiliary satellite, which has an interface that is compatible with the European Ariane vehicle.

### SPECIFICATIONS

<b>Height</b>	44.4 m	
<b>Lift-Off Mass</b>	294 t	
<b>No of Stages</b>	4	
<b>Payloads</b>	TES	<b>2 International Customer Satellites</b> Germany (1), Belgium (1)
<b>Orbit Height</b>	568 km	568 x 638 km
<b>Apogee</b>	638 km	
<b>Perigee</b>	568 km	



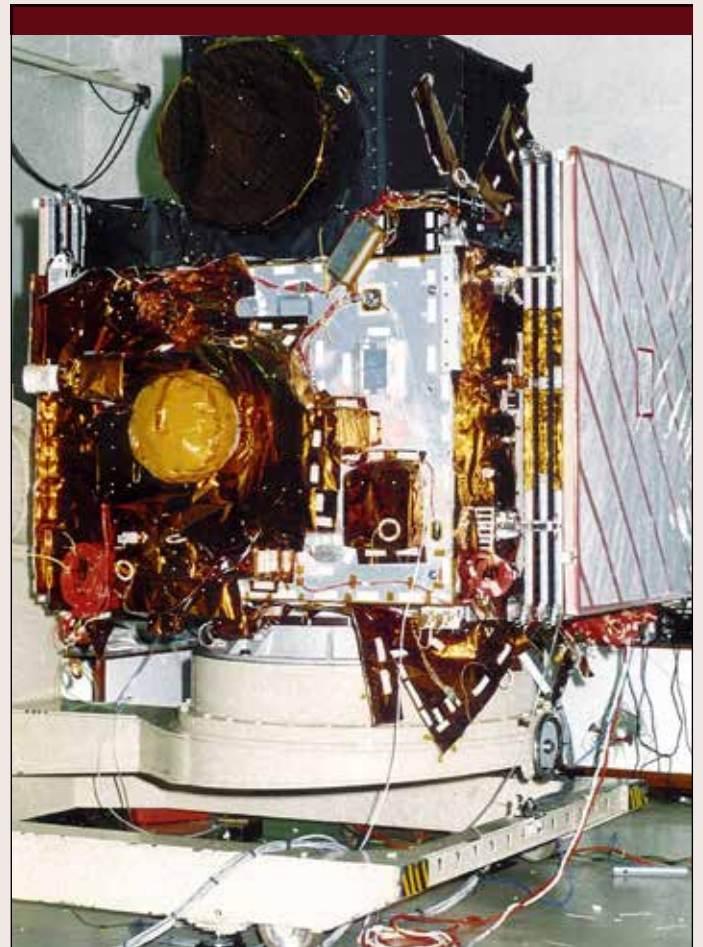
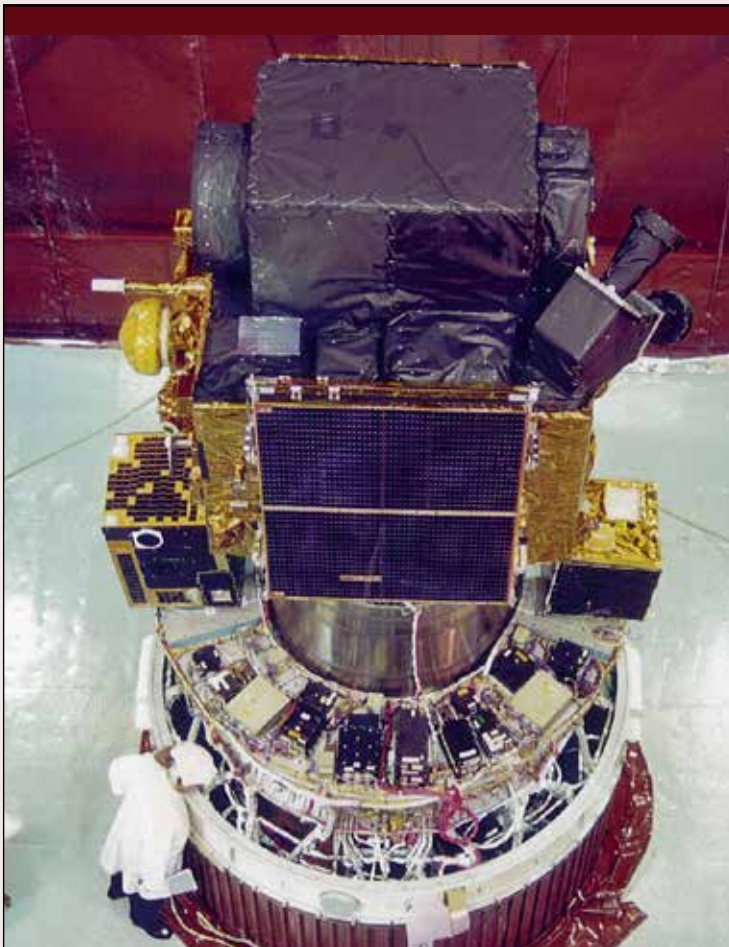
# TECHNOLOGY EXPERIMENT SATELLITE (TES)

## THE SATELLITE

The Technology Experiment Satellite (TES) is an experimental satellite to demonstrate and validate in orbit technologies that could be used in the future satellites of ISRO. Some of the technologies that were planned to be demonstrated in TES are attitude and orbit control system, high-torque reaction wheels, new reaction control system employing optimised thrusters and a single propellant tank, light-weight spacecraft structure, solid state recorder, X-band phased array antenna, improved satellite positioning system, miniaturised TTC and power systems and, two-mirror-on-axis camera optics. TES will also carry a Panchromatic Camera for Remote Sensing experiments.

## SPECIFICATIONS

<b>Weight</b>	1108 kg
<b>Type of Satellite</b>	Earth Observation
<b>Payloads</b>	PAN



# THE INTERNATIONAL CUSTOMER SATELLITES

## PROBA

PROBA (Project for On Board Autonomy) is a small satellite of Verhaert, Belgium weighing 94 kg. The payloads in the satellite include high-resolution camera with 115 mm diameter aperture and wide angle camera having aperture of 60 mm.

## BIRD

BIRD (Bispectral and Infrared Remote Detection) is a small satellite of the German Space Agency, DLR, weighing 92 kg. It is intended for testing small satellite technologies and a new generation of infrared sensors for the detection of hot spots like forest fires and volcanoes from space.