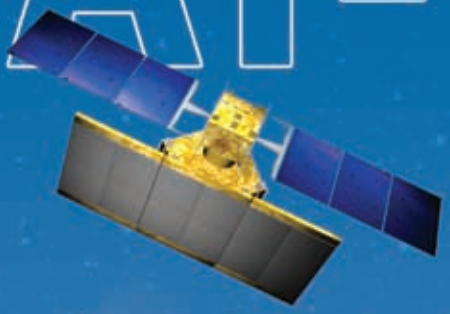
RISAT-1

PSLV-C19



ISRO

PSLV-C19

The Polar Satellite Launch Vehicle, in its 21st flight (PSLV-C19), will launch India's first Radar Imaging Satellite – RISAT-1 into a Polar Circular Orbit with an altitude of 480 km (± 40.5 km) and orbital inclination of 97.552^0 (± 0.2^0). RISAT-1 weighing 1858 kg is the heaviest satellite being launched by PSLV.

This is the third flight of the high end version (PSLV-XL) with six extended strap-on motors, each carrying 12 tonnes of solid propellant. (The two earlier flights of PSLV-XL were used to launch Chandrayaan-1 and GSAT-12 Communication Satellite)

PSLV-C19 Vehicle – Lift-off Mass: 321 tonne, Height: 44.5 m

PSLV-C19 on the First Launch Pad

	STAGE-1	STAGE-2	STAGE-3	STAGE-4
Nomenclature	Core Stage (PS1) + 6 Strap-on Motors	PS2	PS3	PS4
Propellant	Solid (HTPB Based)	Liquid (UH25 + N_2O_4)	Solid (HTPB Based)	Liquid (MMH+MON-3)
Mass (tonne)	138.0 (Core), 6 x 12.0 (Strap-on)	41.7	7.6	2.5
Max Thrust (kN)	4819 (Core), 6 x 716 (Strap-on)	804	240	7.3X2
Burn Time (Sec)	101.5 (Core), 49.5 (Strap-on)	149	112.1	523
Stage Dia (m)	2.8 (Core), 1.0 (Strap-on)	2.8	2.0	2.8
Stage Length (m)	20 (Core), 14.7 (Strap-on)	12.8	3.6	2.6

HTPB: Hydroxy Terminated Poly Butadiene
UH 25: Unsymmetrical di-methyl Hydrazine + Hydrazine hydrate
MMH: Mono Methyl Hydrazine
MON: Mixed Oxides of Nitrogen

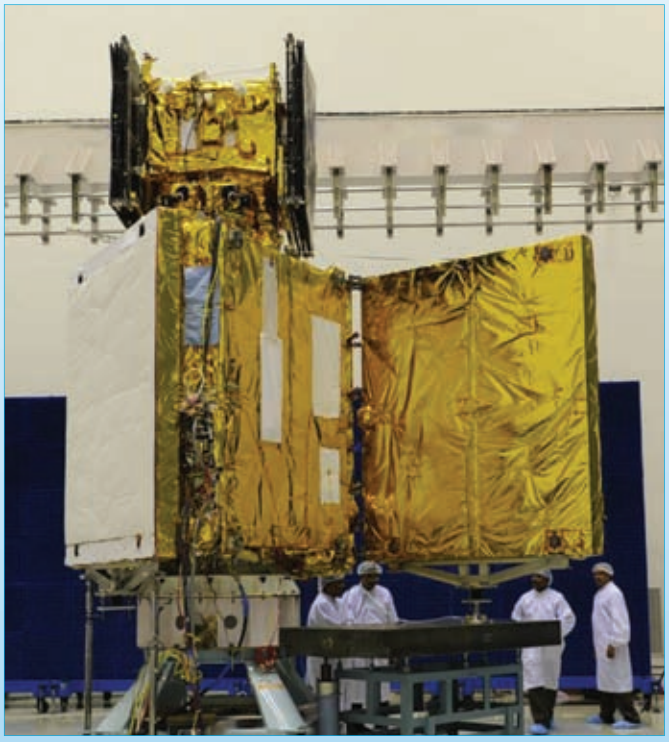
RISAT-1

Radar Imaging Satellite-1 (RISAT-1) is a state of the art Microwave Remote Sensing Satellite carrying a Synthetic Aperture Radar (SAR) payload operating in C-band (5.35 GHz), which enables imaging of the earth surface features during both day and night under all weather conditions.

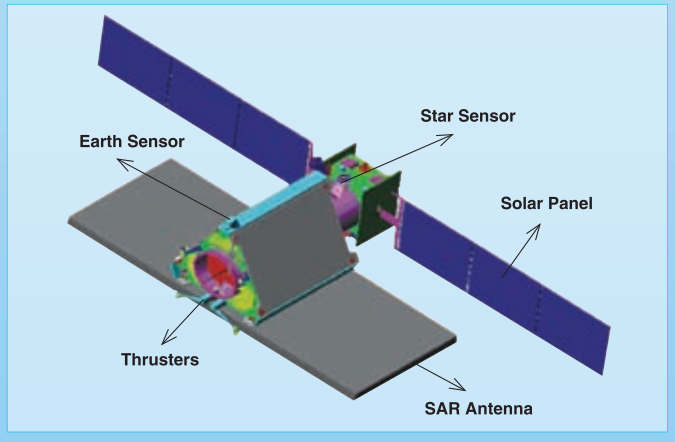
The satellite onboard propulsion system will be used to raise the orbital altitude to 536 km, with orbital inclination of 97.552^0 to place RISAT-1 into a Polar Sun-Synchronous Orbit.

Salient Features

Orbit	:	Circular Polar Sun Synchronous
Orbit Altitude	:	536 km
Orbit Inclination	:	97.552^0
Orbit Period	:	95.49 min
Number of Orbits per day	:	14
Local Time of Equator Crossing	:	6:00 am/6:00 pm
Repetivity	:	25 days
Lift-off Mass	:	1858 kg
Attitude and Orbit Control	:	3-axis body stabilised using Reaction Wheels, Magnetic Torquers, and Hydrazine Thrusters
Power	:	Solar Array generating 2200 W and One 70 AH Ni-H2 battery
Nominal Mission Life	:	5 years

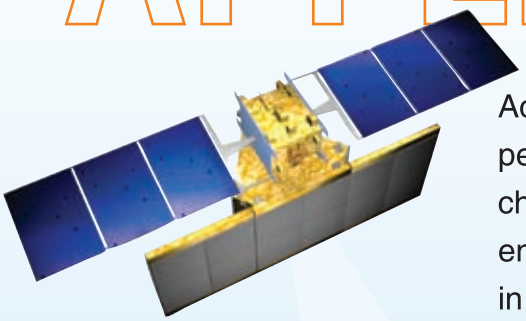


RISAT-1 Satellite undergoing tests

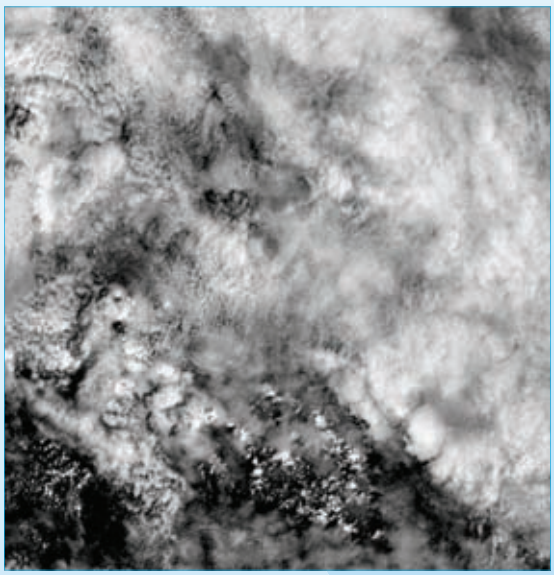


RISAT-1 Satellite (Schematic Diagram)

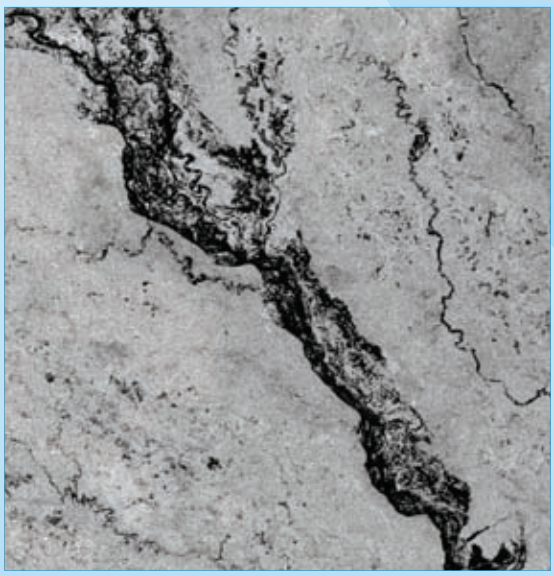
APPLICATIONS



Active Microwave Remote Sensing provides for cloud penetration and day-night imaging capability. These unique characteristics of C-band (5.35GHz) Synthetic Aperture Radar enables applications in agriculture, particularly paddy monitoring in kharif season and management of natural disasters like flood and cyclone.



A cloudy area as seen from Optical Remote Sensing Sensor



A cloudy area as seen from C-band Synthetic Aperture Radar

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