Industrial Participation in Indian Space Program

GEOSPATIAL WORLD FORUM
Geneva May 5 - 9, 2014

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SPACE MISSIONS 2012-2017

	ACHIEVED	TARGETED	PROPOSED		
MISSIONS	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**
EARTH OBSERVATION SATELLITES	RISAT-1 SARAL		CARTOSAT-2C	RESOURCESAT-2A CARTOSAT-2E	OCEANSAT-3 CARTOSAT-3 GISAT
COMMUNICATION & NAVIGATION SATELLITES Procured Launch Service	GSAT-10	IRNSS-R1A IRNSS-R1B GSAT-14 INSAT-3D GSAT-7	IRNSS-R1C IRNSS-R1D IRNSS-R1E GSAT-6 GSAT-15 GSAT-11	IRNSS-R1F IRNSS-R1G GSAT-9 GSAT-16 GSAT-17 GSAT-18	GSAT-6A GSAT-19E GSAT-11S GSAT-Ka
SPACE SCIENCE & PLANETARY EXPLORATION SATELLITES		MARS ORBITER	ASTROSAT	CHANDRAYAAN-2	ADITYA
INDIAN LAUNCH VEHICLES PSLV GSLV GSLV MkIII	C19 C21 Commercial C20	C22 C23 C25 D5 Mk III-X	C24 C26 C27 C28 C29 D6	C30 C31 C32 C33 Commercial C34 F08 F09	C35 C36 F10 F11 D1

Indian Space Programme

- Increasing no. of missions : > 100 space missions completed
- Increased no. of launches per year
- Increased no. of satellite projects
- Improving Technology
- Miniaturisation
- Standardisation

Enhancing Industrial participation

- Launch vehicle systems
- Satellites
- Ground systems, integration and testing
- Components, Materials and consumables
- Technology development and transfer
- Capacity building to strengthen the Industry

Industry participation

- Interstage structures and tanks production
- Motor cases materials and fabrication
- Liquid Engine subsystems and control components realisation
- Composite systems production
- Production and testing of electronic packages
- Production of liquid & solid propellants
- Production of raw materials
- Subsystem and system level integration and testing
- Establishing facility in a turn-key basis and operating

Technology transfers and out sourcing

- ASIC Based demodulator
- Distress Alert Transmitter
- Indigenous GIS software
- Adhesives
- EPY 1061 coating compound
- Multi-layer printed Antenna technology
- Dual polarisation LIDAR
- Solid State Power amplifier
- Precision tapping attachment
- ……

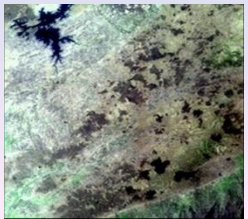
OUT SOURCING IN LAUNCH VEHICLE TECHNOLOGY

Miniaturization Achievements

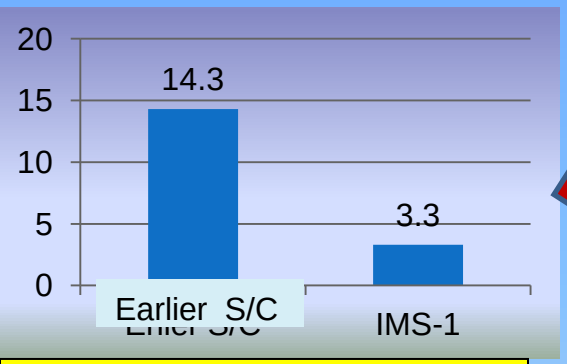
IRS 1A/1B Mass – 1000 Kg
Power generated – 800W
LISS-2 - mass :160 kg -
four Bands
Resolution 36m
swath 148 km

IMS total Mass – 85 Kg
Power – 250W
Payloads – Multi Spectral Camera
Mass – 5.4 kg ; four bands
Resolution 37m ; swath 151km
+ 64 band Hyper Spectral Camera

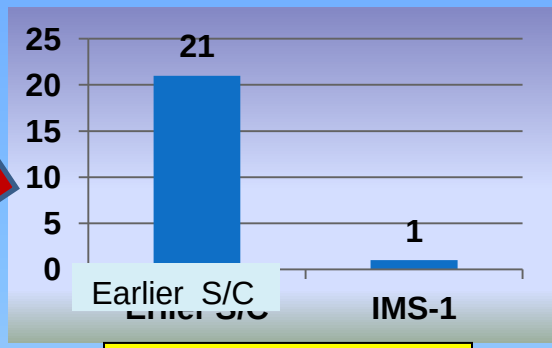
IMS-1



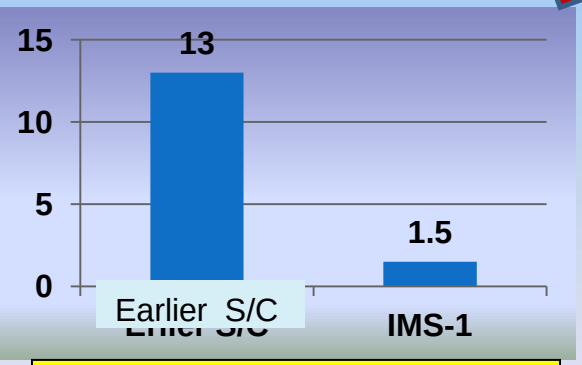
MINIATURISATION OF SOME OF THE SUB-SYSTEMS In IMS



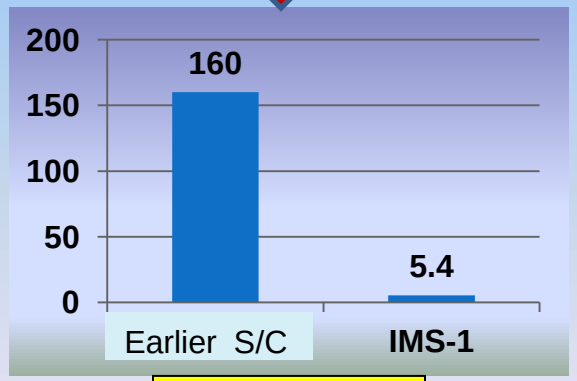
Inertial Reference Unit



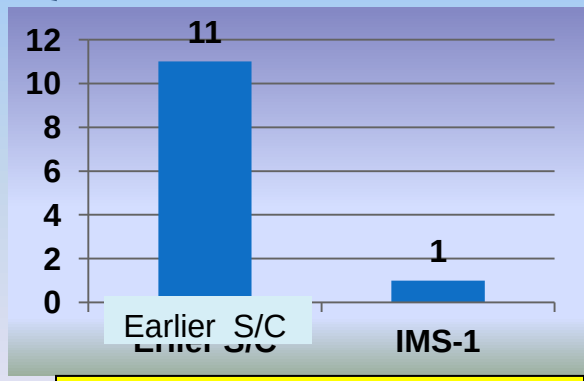
Data Handling



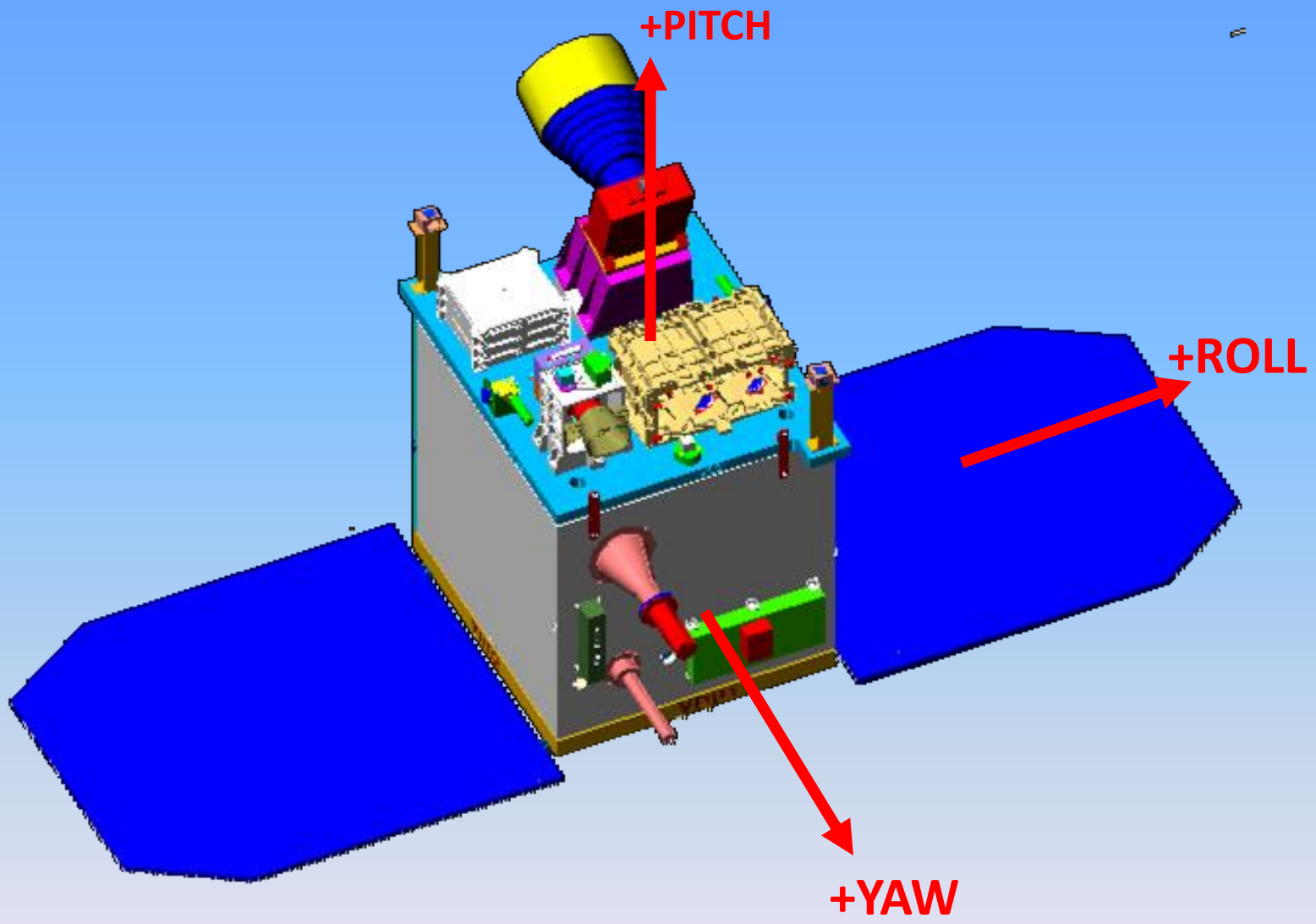
Bus Management Unit



Payload

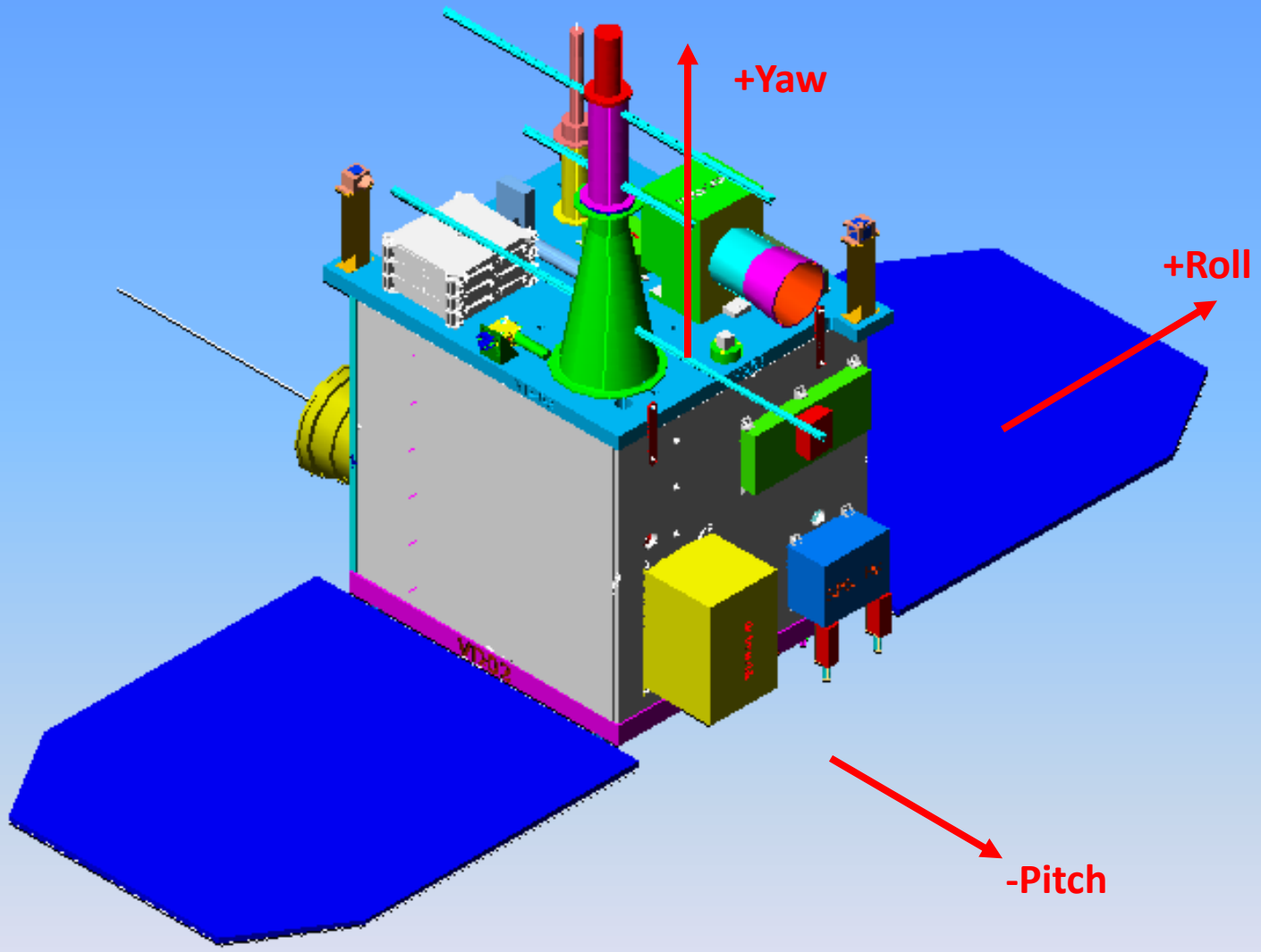


Deployment Mechanisms



IMS-1 AXES DEFINITION

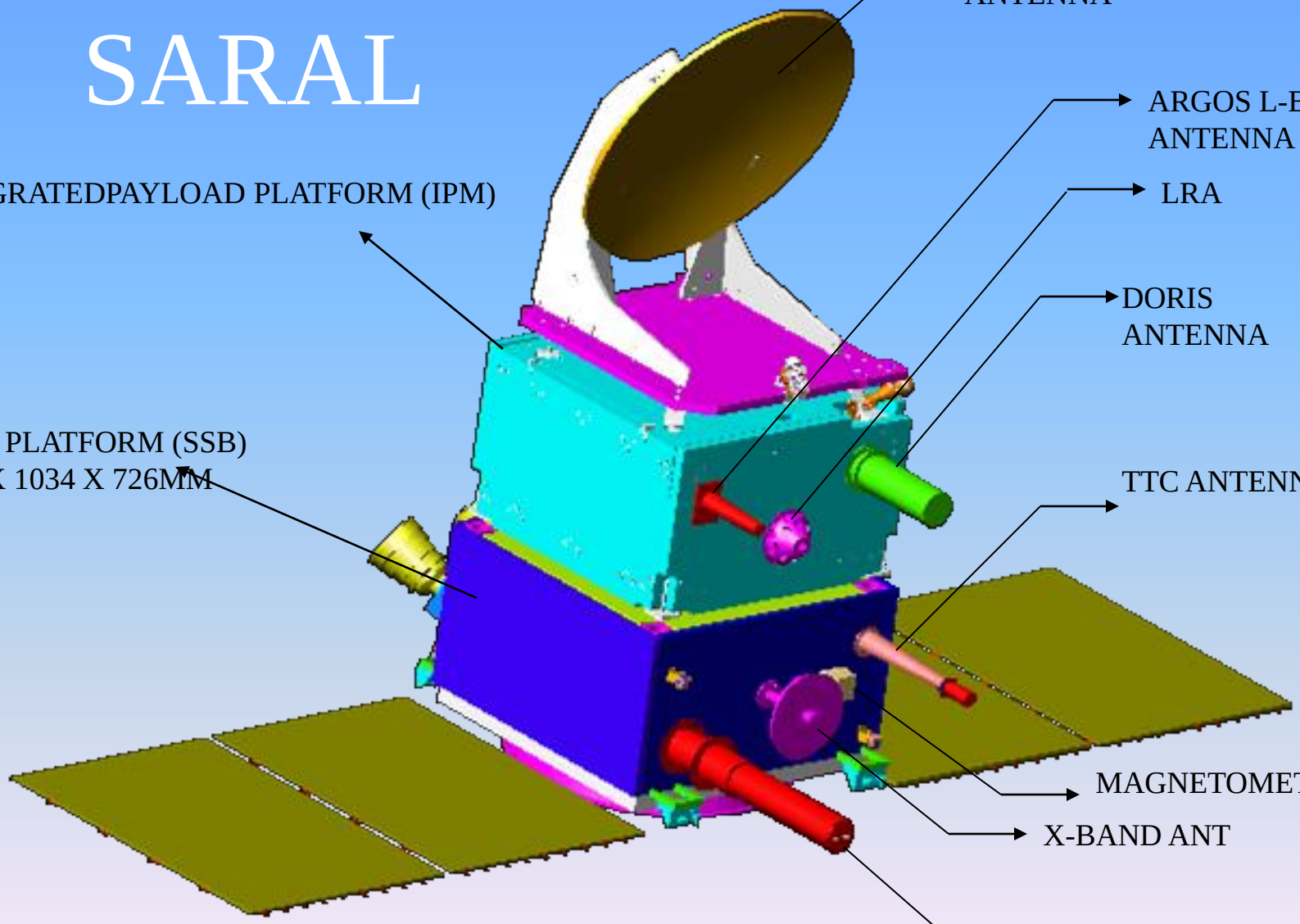
YOUTHSAT AXES DEFINITION



SARAL SPACECRAFT 3D VIEW

(DEPLOYED CONFIGURATION)

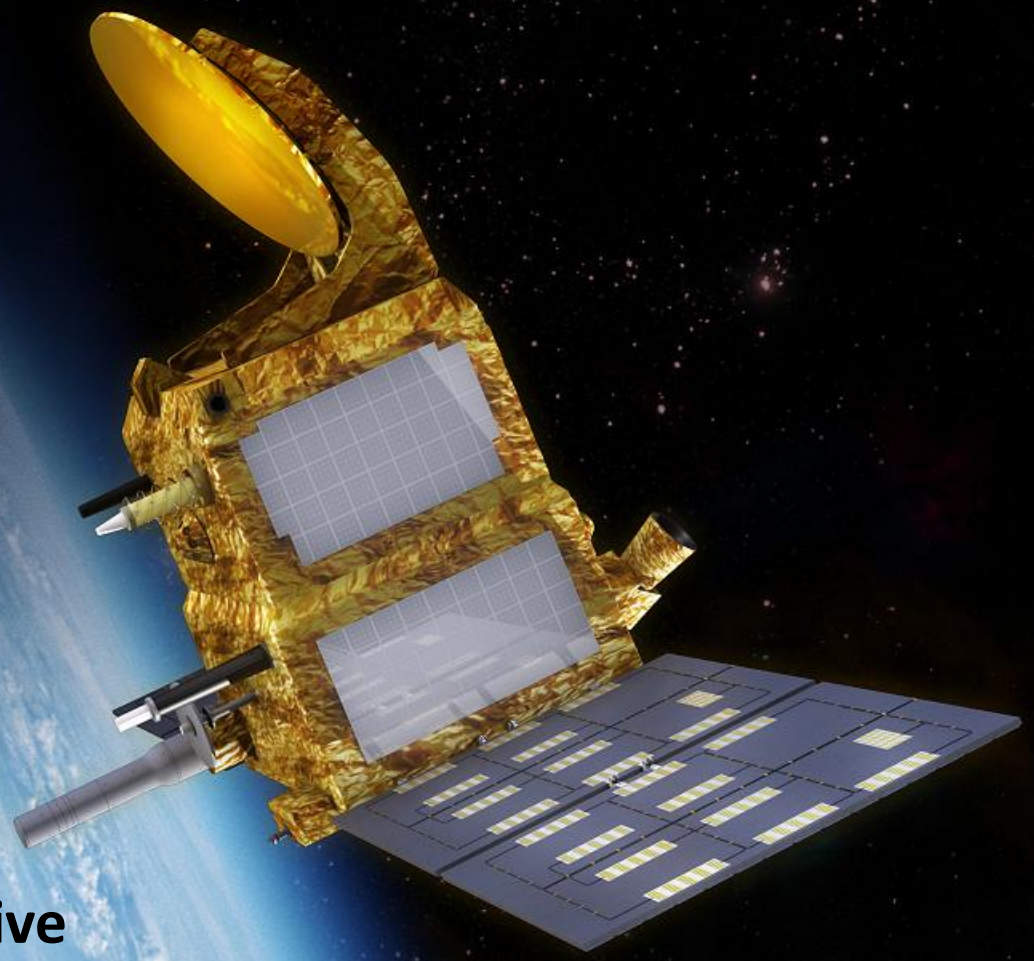
SARAL



PAYLOAD CAPABILITY

MICRO SATELLITE BUS	SMALL SATELLITE BUS
P/L Mounting : on the TOP DECK or AEV DECK Volume : 450(R)x500(Y)x200(P) Mass : 30 kg Power : 20 W Continuou 35 W Peak (15 min x 14) Power I/f: Raw Bus (28 –33 V) Data I/f : LVDS / 1553 B Data rate: up to 8 Mbps HK I/f : 1553B	P/L Mounting : on a separate platform over TOP DECK with four point interface Volume : 900x900x800 Mass : 150 -200kg Power : 150 W Continuous Power I/f: Raw Bus (28 –33 V) Data I/f : LVDS / 1553 B Data rate: up to 20 Mbps HK I/f : 1553B

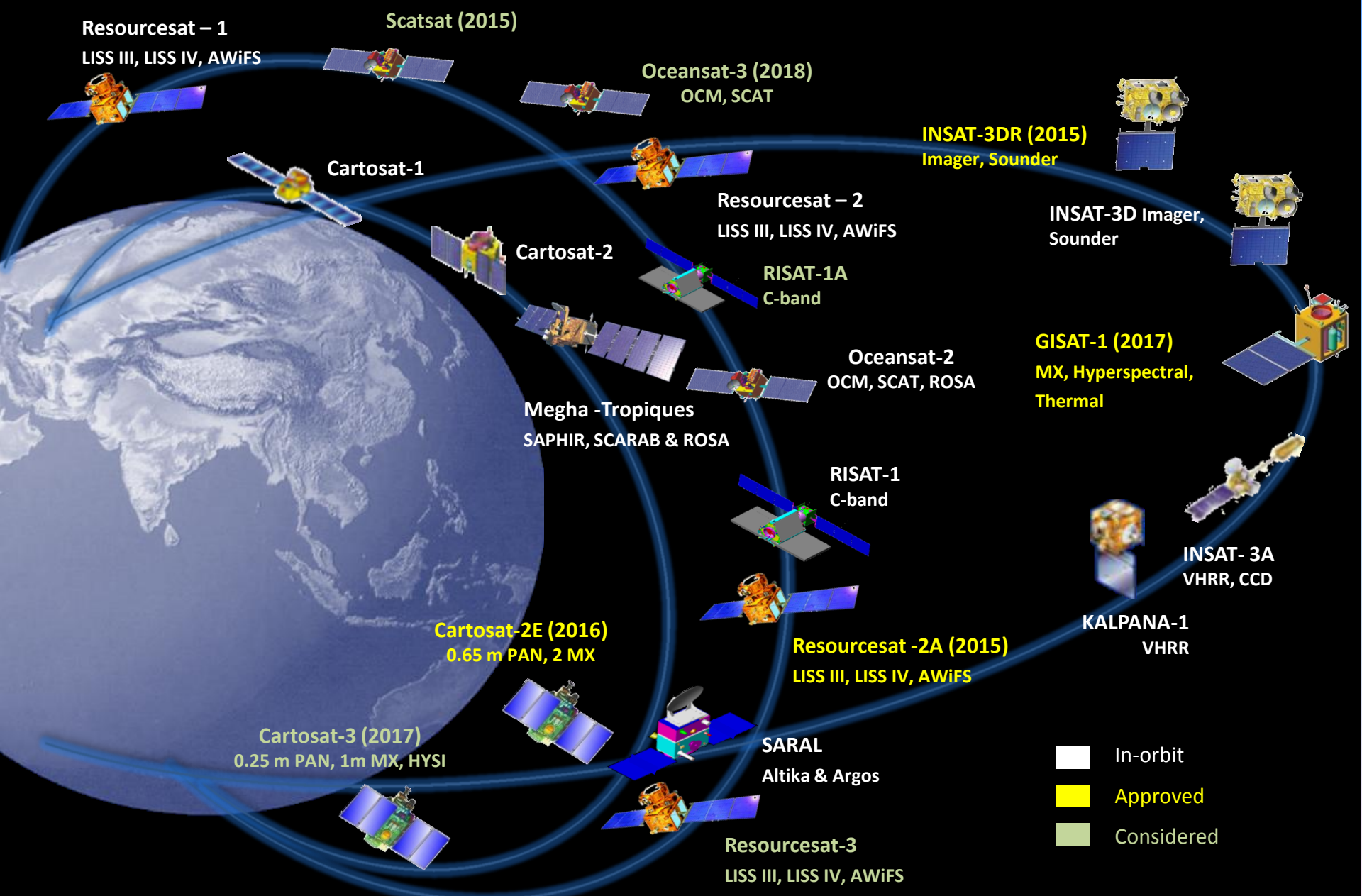
SARAL



First Mission on ISRO's IMS-2 Spacecraft Bus

Indo – French co-operative Mission for Ocean and Climate Studies & Applications

Indian EO Scenario in near future



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THANKS for attention

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