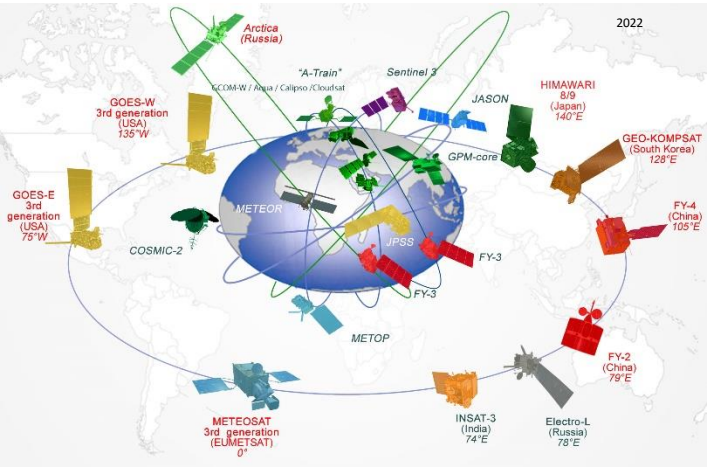
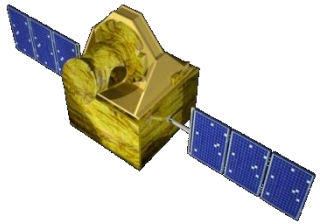


ISRO Report on Current Missions and Future Plans

Presented to CGMS-49 Working Group III session

Current Missions- LEO - Status

OCEANSAT-2



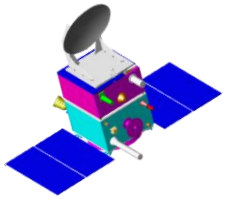
Launch: September, 2009

Payloads: OCM (8 bands), Scatterometer (OSCAT-1)

- OSCAT-1 stopped functioning in 2014
- OCM continues to provide 360 m data (local) & 1km data (global)

Satellite health in the current configuration Nominal.

SARAL



Launch: February, 2013

Payloads: Ka band Altimeter, Argos-3

- In drifting orbit since 2016.

Though reaction wheels show high torque and star sensor issues, provides useful data.

SCATSAT-1

Launch: September, 2016

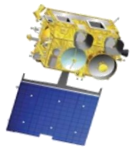
Payload: Scatterometer

- Main chain was switched off in 2018.
- Stopped operations on Feb. 28, 2021 due to redundant chain malfunction.

Detailed analysis is ongoing.

Current Missions- GEO - Status

INSAT-3D

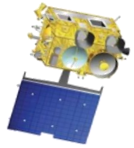


Launch: July 2013 (82º E)

Payloads: 6 Channel Imager; 19 Channel Sounder

- Imager operational
- Sounder stopped functioning since Sept 2020.

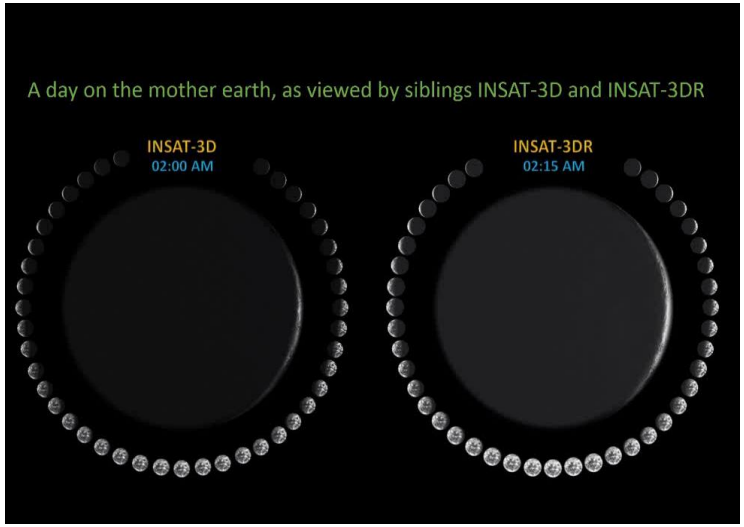
INSAT-3D-R



Launch: September 2016 (74º E)

Payloads: 6 Channel Imager; 19 Channel Sounder

- Operational

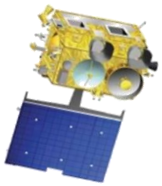


INSAT 3D and 3DR together provides observations at 15-minute interval : 48 images/ day and sounding at every half an hour.

CGMS

Upcoming satellites - GEO

INSAT-3D-S



Launch: 2022 (82° E)

Payloads: 6 Channel Imager; 19 Channel Sounder

- Similar to INSAT-3D & 3DR

6 Channel IMAGER	
Bands (μm)	Resolution
VIS (0.55-0.75)	1km
SWIR (1.55-1.70)	1 km
MIR (3.8-4.0)	4km
WV (6.5-7.1)	8km
TIR-1 (10.2-11.3)	4km
TIR-2 (11.5-12.5)	

19 Channel SOUNDER

Central WL : 0.695 – 14.71 um

Visible : One Band

SWIR : Six bands

MWIR : Five Bands

LWIR : Seven Bands

Resolution (km): 10 X 10

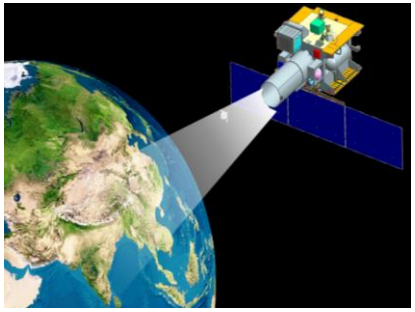
40 profiles of Temp. (surface to 70 km)

21 Profiles of Humid. (surface to 15 km)

Integrated Ozone (Surface to ~ 12 km)

Upcoming satellites - GEO

GEO IMAGING SATELLITE



- GSO : 85.5 deg E
- Altitude : 35786 km
- Mission Life : 7 years

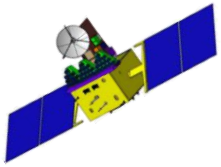
Instrument	Spectral channels	Spatial Resolution (meter)	Swath (Km)
MX-VNIR	6	42	495
HyS-VNIR	158	320	163
HyS-SWIR	256	191	191

- ❖Multiple daily observations & Any place Imaging
- ❖Rapid scan 500 x 500 km in 5 mins.
- ❖Improved monitoring of crops, vegetation condition, water bodies, rapid forest change.
- ❖More frequent monitoring of natural disasters viz., flood inundation – advantage of wider swath

Parameter	MX-VNIR alone	MX-VNIR & HyS-VNIR	All Three
Scan Area	4000 x 4000 km	1000 x 3000	1000 x 1000
Scan Duration	78 min	72 min	65 min
Full India Coverage	4 times a day	2 times a day	2 days

Upcoming satellites - LEO

OCEANSAT SERIES



Two satellites

Launch: October 2021 (first satellite)

Orbit : Sun synchronous ; 720 km ; ECT: 12:00 Hrs

Payloads: OCM-3 (13 bands: 402 to 1020 nm) : 360 m
OSCAT-2 (Ku Band - 13.51 GHz)
SSTM-1 (2 Bands: 11 &12 µm) : 1080 m
Argos-4 (CNES Payload)

SSTM specifications

S. No.	Parameter	Design Goal
1	Instantaneous Geometric Field of View (IGFOV) at nadir (m)	< 1080 m
2	Spectral bands (µm)	10.75 - 11.25 11.75 - 12.25
3	Band Width (µm)	0.5
4	Swath (km)	1440
6	NEdT @ 300K	< 150mK
7	Saturation temperature (K)	> 340

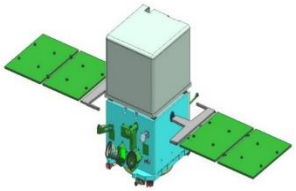
OCM-3 Band description and their applications

Band #	Central WL (nm)	Primary Application
B1	412	Differentiate yellow substance from chlorophyll
B2	443	Chlorophyll absorption maximum; low chlorophyll
B3	490	Moderate chlorophyll
B4	510	High chlorophyll; Total Suspended Matter
B5	555	Reference baseline for Chlorophyll
B6 *	566	Phycoerythrin absorption , Trichodesmium bloom detection
B7	620	Turbidity in coastal Case 2 waters, Phycocyanin absorption
B8*	670	Baseline for fluorescence line height (FLH), chl secondary absorption
B9 *	681	Chlorophyll fluorescence
B10 *	710	Baseline for FLH, vegetation - chlorophyll fluorescence; atmospheric Correction
B11	780	Atmospheric correction; avoids O2 absorption Band
B12	870	Atmospheric correction; good assessment of spectral scattering
B13 *	1010	Atmospheric correction in turbid waters, aerosol – white foam discrimination

CGMS

Missions under Study Phase

MW Temp & Hum Sounder

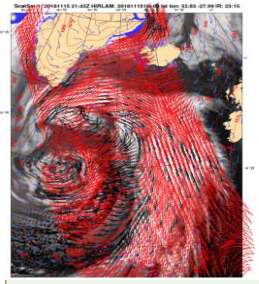


TSU: 25 km; HSU: 10km

T: 1-2 K, WV:15-25%,

- As a follow-on of SAPHIR Payload
- 35° inclined orbit.

DF-SCAT (C & Ku)



C & Ku band ; 5 km regional & 25 km global ; Accuracy < 1.5 m/s

- Designed with a single 2m-diameter reflector rotating at 24 rpm

MW Radiometer

6-89 GHz, H & V polarization
Spatial resolution: 2 km ;
sub-daily (Low inclination orbit)
NEdT<0.5K,
0.5-0.7 K resolution (for SST)

INSAT Next Gen.

Imager- 500 m (VIS/ NIR/ SWIR) ; **1 Km** (MIR/ TIR) ;

Hysp IR Sounder - 5 Km; (650- 2600 cm-1);

Lightning mapper at 777.4 nm.

Scan: Indian Region: 5 min, Full Disk: 15 min