→ THE EARTH OBSERVATION HANDBOOK

2012 | Key Tables (Updated October 2012)

→ THE EARTH OBSERVATION HANDBOOK 2012 | Special Edition for Rio+20

Introduction

The Earth Observation Handbook, prepared by the European Space Agency (ESA) in support of the Committee on Earth Observation Satellites (CEOS), presents the main capabilities of satellite Earth observations, their applications, and a comprehensive over- view of present and planned civil space agency Earth observation satellite missions and their instruments. The plans of more than 30 space agencies for missions, instruments and measurements during the coming decades are surveyed and captured in the report - making it the most up-to-date and comprehensive statement of governmental Earth observation programmes available.

The print edition of the EO Handbook is published every few years, and is always keenly anticipated by the space community for its insights into future trends world-wide in remote sensing programmes. The database which serves as the foundation for the missions, instruments, and measurements information at the heart of the Handbook content is updated annually and is always available on-line at:

http://database.eohandbook.com

The CEOS database is the only official, consolidated statement of the Earth observation programmes and plans of all the world's civil space agencies. The database is the cornerstone of the efforts of CEOS coordination on gaps and overlaps to optimise global observations in support of key societal needs such as climate change information.

The 2012 survey of CEOS space agencies is complete as of October 2012, and the database has been updated with the results. The database now features details of 268 Earth observing satellite missions and 812 instruments (399 distinct instruments, some being repeats), which are currently operating or planned for launch in the next 15 years - funded and operated by around 30 space agencies worldwide. The database allows users to filter, export and analyse this information in support of their analyses and planning.

The ESA team has prepared this printable PDF of key tables based on the 2012 database contents. It is hoped that this document will provide an solution of value to those many users who welcome having a bookshelf reference to hand.

The contents are as follows:

Recent & upcoming launches

13 missions were launched by CEOS agencies from the start of October 2011 through to end September 2012 (the cut-off date for inputs to this publication).

Mission	Agency	Launch
MEGHA-TROPIQUES	CNES / ISRO	Oct 2011
Suomi NPP (Suomi National Polar-orbiting Partnership)	NASA / NOAA	Oct 2011
ZY-02C (Earth Resources Satellite)	CRESDA	Nov 2011
Pleiades 1A	CNES	Dec 2011
ZY-3 (Mapping satellites)	CRESDA	Jan 2012
FY-2F (FY-2F Geostationary Meteorological Satellite)	NSMC-CMA / NRSCC	Jan 2012
LARES (LAser RElativity Satellite)	ASI	Feb 2012
RISAT-1 (Radar Imaging Satellite)	ISRO	Apr 2012
GCOM-W1 (Global Change Observation Mission-W1)	JAXA	May 2012
KOMPSAT-3 (Korea Multi-Purpose Satellite -3)	KARI / DLR	May 2012
Meteosat-10 (Meteosat Second Generation-3)	EUMETSAT / ESA	Jul 2012
Kanopus-V N1 (Kanopus-V Environmental Satellite N1)	ROSKOSMOS / ROSHYDROMET	Jul 2012
Metop-B (Meteorological Operational Polar Satellite - B)	EUMETSAT / ESA	Sep 2012

18 missions are planned for launch from the start of October 2012 through to end October 2013.

Mission	Agency	Launch
HJ-1C (Disaster and Environment Monitoring and Forecast Small Satellite Constellation C)	CRESDA / CAST / NRSCC	Nov 2012
Swarm (Earth's Magnetic Field and Environment Explorers)	ESA / CNES / CSA	Nov 2012
Pleiades 1B	CNES	Nov 2012
SARAL (Satellite with ARgos and ALtiKa)	CNES / ISRO	Dec 2012
CBERS-3 (China Brazil Earth Resources Satellite - 3)	INPE / CRESDA	Feb 2013
Meteor-M N2 (Meteor-M Meteorological Satellite N2)	ROSHYDROMET / ROSKOSMOS	Feb 2013
CASSIOPE	CSA	Feb 2013
LDCM (Landsat Data Continuity Mission)	NASA / USGS	Feb 2013
KOMPSAT-5 (Korea Multi-Purpose Satellite -5)	KARI	Mar 2013
Resurs P N1 (Resurs P Environmental Satellite N1)	ROSKOSMOS / ROSHYDROMET	May 2013
INSAT-3D (Indian National Satellite - 3D)	ISRO	Jun 2013
VENUS (Vegetation and Environment monitoring on a New Micro-Satellite)	CNES / ISA	Jun 2013
FY-3C (FY-3C Polar-orbiting Meteorological Satellite)	NSMC-CMA / NRSCC	Jul 2013
Kanopus-V N2 (Kanopus-V Environmental Satellite N2)	ROSKOSMOS / ROSHYDROMET	Jul 2013
TCTE (TSI Calibration Transfer Experiment)	NASA	Aug 2013
AISSat-2 (Automatic Identification System Satellite-2)	NSC	Aug 2013
HY-2B (Ocean dynamics satellite B)	NSOAS / CAST	Aug 2013
Sentinel-1 A	ESA / EC	Oct 2013

A-Z table of satellite missions

CEOS agencies are operating or planning 268 individual satellite Earth observation missions in the 2012 - 2027 period. The table below presents their main characteristics. Please refer to the missions table in the on-line database for the ability to export or analyse this data in more detail:

http://database.eohandbook.com/database/missiontable.aspx

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
3D Winds Three Dimensional Tropospheric Winds from Space Based Lidar NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. Tropospheric winds for weather forecasting and pollution transport.	HDWL (3D Winds)	Type: Sun-synchronous Altitude: 400 km Period: Inclination: 97.03 deg Repeat cycle: 12 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: decadal.gsfc.nasa.gov/3d-winds.html
ACE Aerosol Clouds and Ecosystem Mission NASA	Considered	2020	2023	Phase-2 DS Mission, launch order unknown, 3-year nominal mission. Aerosol and cloud profiles for climate and water cycle; ocean colour for open ocean biogeochemistry.	Cloud radar (ACE), Next Gen APS (ACE), Multi-band UV/VIS Spectrometer (ACE), HSRL (ACE)	Type: Sun-synchronous Altitude: 650 km Period: Inclination: 98.2 deg Repeat cycle: LST: 13:00 Longitude (if geo): Asc/desc: Ascending URL: dsm.gsfc.nasa.gov/ace/science.html
ACRIMSAT Active Cavity Radiometer Irradiance Monitor NASA	Currently being flown	20 Dec 1999	Sep 2013	5-year nominal mission life, currently in extended operations. Will sustain long-term solar luminosity database by providing measurements of total solar irradiance and the solar constant.	ACRIM III	Type: Sun-synchronous Altitude: 716 km Period: 90 mins Inclination: 98.13 deg Repeat cycle: LST: 10:50 Longitude (if geo): Asc/desc: Descending URL: acrim.jpl.nasa.gov/
ADM-Aeolus Atmospheric Dynamics Mission (Earth Explorer Core Mission) ESA	Approved	Jul 2015	Jul 2019	Will provide wind profile measurements for global 3D wind field products used for study of atmospheric dynamics, including global transport of energy, water, aerosols, and chemicals.	ALADIN	Type: Sun-synchronous Altitude: 405 km Period: 92.5 mins Inclination: 97.01 deg Repeat cycle: 7 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/export/esaLP/aeolus.html
AISSat-1 Automatic Identification System Satellite-1 NSC	Currently being flown	12 Jul 2010	Aug 2013	Demonstrate and extend access to AIS (Automatic Identification System) signals beyond the land-based AIS system operated by the Norwegian Coastal Administration today. Observe ship traffic in the High North.	SDR	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.71 deg Repeat cycle: LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
AISSat-2 Automatic Identification System Satellite-2 NSC	Approved	Aug 2013	Aug 2016	Demonstrate and extend access to AIS (Automatic Identification System) signals beyond the land-based AIS system operated by the Norwegian Coastal Administration today. Observe ship traffic in the High North.	SDR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Descending URL:
ALOS-2 Advanced Land Observing Satellite-2 JAXA	Approved	Dec 2013	Dec 2018	Environmental monitoring, disaster monitoring, civil planning, agriculture and forestry, Earth resources, land surface.	PALSAR-2 (ALOS-2)	Type: Sun-synchronous Altitude: 628 km Period: 100 mins Inclination: 97.9 deg Repeat cycle: 14 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: www.jaxa.jp/projects/sat/alos2/index_e.html
ALOS-3 Advanced Land Observing Satellite-3 JAXA	Considered	2015	2020	Cartography, digital terrain models, environmental monitoring, disaster monitoring, civil planning, agriculture and forestry, Earth resources, land surface.	PRISM-2 (ALOS-3), HISUI	Type: Sun-synchronous Altitude: 618 km Period: Inclination: Repeat cycle: 60 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL:
AMAZONIA-1 Amazonia 1 INPE	Approved	Dec 2014	Dec 2017	Earth resources, environmental monitoring, land surface.	AWFI	Type: Sun-synchronous Altitude: 752 km Period: 99.9 mins Inclination: 98.4 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.inpe.br
Aqua Aqua (formerly EOS PM-1) NASA / JAXA / INPE	Currently being flown	04 May 2002	Sep 2013	6-year nominal mission life, currently in extended operations. Atmosphericdynamics/water and energy cycles, cloudformation, precipitationand radiativeproperties, air/seafluxes of energy andmoisture, sea ice extentand heat exchange with the atmosphere.	AIRS, MODIS, CERES, HSB, AMSR-E, AMSU-A	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.gsfc.nasa.gov
Arctica ROSHYDROMET	Approved	Dec 2015	Dec 2018	Meteorology, oceanography, including ice cover monitoring and disaster monitoring in the Arctic region. The payload and design of the satellites is similar to the ones in the Electro-L series. Molniya orbit.	MSU-GS, DCS , GGAK-E	Type: Highly elliptical Altitude: Period: 718 mins Inclination: Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: N/A URL:
Arkon-2M ROSKOSMOS	Planned	2013	2018	Earth observations and weather information.	Arkon-2M SAR	Type: Sun-synchronous Altitude: 500 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: www.federalspace.ru
ASCENDS Active Sensing of CO2 Emissions over Nights, Days, and Seasons NASA	Considered	2020	2023	Phase-2 DS Mission, launch order unknown, 3-year nominal mission. Day/night, all-latitude, all-season CO2 column integrals for climate emissions.	CO2 and O2 LIDAR (ASCENDS), CO Sensor (ASCENDS)	Type: Sun-synchronous Altitude: 450 km Period: 97.3 mins Inclination: Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: cce.nasa.gov/ascends/index.htm
Aura Aura (formerly EOS Chemistry) NASA / NSO / FMI / UKSA	Currently being flown	15 Jul 2004	Sep 2013	5-year nominal mission life, currently in extended operations. Chemistry and dynamics of Earth's atmosphere from the ground through the stratosphere.	MLS (EOS-Aura), TES, HIRDLS, OMI	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:38 Longitude (if geo): Asc/desc: Ascending URL: aura.gsfc.nasa.gov/
CALIPSO Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations NASA / CNES	Currently being flown	28 Apr 2006	Sep 2013	3-year nominal mission life, currently in extended operations. Measurements of aerosol and cloud properties for climate predictions, using a 3 channel lidar and passive instruments in formation with Aqua and CloudSat for coincident observations of radiative fluxes and atmospheric state.	WFC, IIR, CALIOP	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www-calipso.larc.nasa.gov/
CARTOSAT-1 Cartography Satellite - 1 (IRS P5) ISRO	Currently being flown	05 May 2005	Dec 2013	High precision large-scale cartographic mapping of 1:10000 scale and thematic applications (with merged XS data) at 1:4000 scales.	PAN (Cartosat-1)	Type: Sun-synchronous Altitude: 618 km Period: 97 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
CARTOSAT-1A Cartography Satellite -1A ISRO	Considered	2014	2019	Ensure the continuity of high resolution imaging capability with multispectral capability, stereo imaging and hyperspectral imaging.	PAN (IRS-1A), MX (IRS-1A)-VNIR, HYSI (IRS-1A)-VNIR, HYSI (IRS-1A)-SWIR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
CARTOSAT-1B Cartosat -1B ISRO	Considered	2017	2022	Ensure the continuity of high resolution imaging capability with multispectral capability, stereo imaging and hyperspectral imaging.	PAN (IRS-1A), MX (IRS-1A)-VNIR, HYSI (IRS-1A)-VNIR, HYSI (IRS-1A)-SWIR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
CARTOSAT-2 Cartography Satellite - 2 ISRO	Currently being flown	10 Jan 2007	Dec 2013	High precision large-scale cartographic mapping of 1:10000 scale and thematic applications (with merged XS data) at 1:4000 scales.	PAN (Cartosat-2)	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
CARTOSAT-2A Cartography Satellite - 2A ISRO	Currently being flown	28 Apr 2008	Apr 2013	High precision large-scale cartographic mapping of 1:10000 scale and thematic applications (with merged XS data) at 1:4000 scales.	PAN (Cartosat-2A/2B)	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
CARTOSAT-2B Cartography Satellite - 2B ISRO	Currently being flown	12 Jul 2010	Jul 2015	High precision large-scale cartographic mapping of 1:10000 scale and thematic applications (with merged XS data) at 1:4000 scales.	PAN (Cartosat-2A/2B)	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
CARTOSAT-2C Cartography Satellite - 2C ISRO	Considered	2014	2018	High precision large-scale cartographic mapping and thematic applications with MX data at 1:4000 scales.	HRMX, PAN (Cartosat-2C)	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
CARTOSAT-2D Cartography Satellite - 2D ISRO	Considered	2016	2022	High precision large-scale cartographic mapping and thematic applications with MX data at 1:4000 scales.	HRMX	Type: Sun-synchronous Altitude: 635 km Period: 97.4 mins Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
CARTOSAT-3 Cartography Satellite - 3 ISRO	Planned	2015	2020	Suitable for cadastral and infrastructure mapping and analysis.	PAN (Cartosat-3/3A)	Type: Sun-synchronous Altitude: 635 km Period: Inclination: 97.9 deg Repeat cycle: LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
CARTOSAT-3A Cartography Satellite - 3A ISRO	Considered	2018	2023	Suitable for cadastral and infrastructure mapping and analysis.	PAN (Cartosat-3/3A)	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
CASSIOPE CSA	Approved	Feb 2013	Nov 2014	The ePOP probe will observe the Earth's ionosphere, where space meets the upper atmosphere.	ePOP	Type: Inclined, non-sun-synchronous Altitude: Period: 103 mins Inclination: 80 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
CBERS-3 China Brazil Earth Resources Satellite - 3 INPE / CRESDA	Approved	Feb 2013	Feb 2016	Earth resources, environmental monitoring, land surface.	WFI-2, MUX, DCS , IRS, PAN (CBERS)	Type: Sun-synchronous Altitude: 778 km Period: 100.3 mins Inclination: 98.5 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/
CBERS-4 China Brazil Earth Resources Satellite - 4 INPE / CRESDA	Approved	Jun 2014	Jun 2017	Earth resources, environmental monitoring, land surface.	WFI-2, MUX, DCS , IRS, PAN (CBERS)	Type: Sun-synchronous Altitude: 778 km Period: 100.3 mins Inclination: 98.5 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/
CFOSAT Chinese-French Oceanic SATellite CNES	Planned	2014	2017	The primary objective of CFOSAT is to monitor at the global scale the wind and waves at the ocean surface.	SWIM, SCAT	Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
CloudSat NASA / DoD (USA) / CSA	Currently being flown	28 Apr 2006	Sep 2013	3-year nominal mission life, currently in extended operations. CloudSat will use advanced radar to "slice" through clouds to see their vertical structure, providing a completely new observational capability from space. One of first satellites to study clouds on global basis. Will fly in formation with Aqua and CALIPSO.	CPR (CloudSat)	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: cloudsat.atmos.colostate.edu/
COMS Communication, Oceanographic, Meteorological Satellite KARI	Currently being flown	26 Jun 2010	Dec 2017	Korea's geostationary meteorological satellite series.	GOCI, MI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -128.2 Asc/desc: N/A URL:
COSMIC-1/FORMOSAT-3 FM1 Constellation Observing System for Meteorology, Ionosphere and Climate-1 NSPO / NOAA / UCAR	Currently being flown	14 Apr 2006	Mar 2013	Meteorology, ionosphere and climate.	GOX	Type: Inclined, non-sun-synchronous Altitude: 800 km Period: 100 mins Inclination: 72 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: www.cosmic.ucar.edu/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
COSMIC-2/FORMOSAT-3 FM2 Constellation Observing System for Meteorology, Ionosphere and Climate-2 NSPO / NOAA / UCAR	Currently being flown	14 Apr 2006	Mar 2013	Meteorology, ionosphere and climate.	GOX	Type: Inclined, non-sun-synchronous Altitude: 800 km Period: 100 mins Inclination: 72 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: www.cosmic.ucar.edu/
COSMIC-4/FORMOSAT-3 FM4 Constellation Observing System for Meteorology, Ionosphere and Climate-4 NSPO / NOAA / UCAR	Currently being flown	14 Apr 2006	Mar 2013	Meteorology, ionosphere and climate.	GOX	Type: Inclined, non-sun-synchronous Altitude: 800 km Period: 100 mins Inclination: 72 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: www.cosmic.ucar.edu/
COSMIC-5/FORMOSAT-3 FM5 Constellation Observing System for Meteorology, Ionosphere and Climate-5 NSPO / NOAA / UCAR	Currently being flown	14 Apr 2006	Mar 2013	Meteorology, ionosphere and climate.	GOX	Type: Inclined, non-sun-synchronous Altitude: 800 km Period: 100 mins Inclination: 72 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: www.cosmic.ucar.edu/
COSMIC-6/FORMOSAT-3 FM6 Constellation Observing System for Meteorology, Ionosphere and Climate-6 NSPO / NOAA / UCAR	Currently being flown	14 Apr 2006	Mar 2013	Meteorology, ionosphere and climate.	GOX	Type: Inclined, non-sun-synchronous Altitude: 800 km Period: 100 mins Inclination: 72 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: www.cosmic.ucar.edu/
COSMO-SkyMed 1 COnstellation of small Satellites for Mediterranean basin Observation - 1 ASI / MiD (Italy)	Currently being flown	08 Jun 2007	Jun 2014	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR 2000	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it/en/activity/earth_observation/cosmoskymed
COSMO-SkyMed 2 COnstellation of small Satellites for Mediterranean basin Observation - 2 ASI / MiD (Italy)	Currently being flown	09 Dec 2007	Dec 2014	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR 2000	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it/en/activity/earth_observation/cosmoskymed
COSMO-SkyMed 3 COnstellation of small Satellites for Mediterranean basin Observation - 3 ASI / MiD (Italy)	Currently being flown	25 Oct 2008	Oct 2015	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR 2000	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it/en/activity/earth_observation/cosmoskymed
COSMO-SkyMed 4 COnstellation of small Satellites for Mediterranean basin Observation - 4 ASI / MiD (Italy)	Currently being flown	06 Nov 2010	Nov 2017	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR 2000	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it/en/activity/earth_observation/cosmoskymed
CryoSat-2 CryoSat-2 (Earth Explorer Opportunity Mission) ESA	Currently being flown	08 Apr 2010	Dec 2013	To determine fluctuations in the mass of the Earth's major land and marine ice fields.	DORIS-NG, SIRAL, Laser Reflectors (ESA)	Type: Inclined, non-sun-synchronous Altitude: 717 km Period: 100 mins Inclination: 92 deg Repeat cycle: 369 days LST: 0.25 degree nodal regression per day Longitude (if geo): Asc/desc: N/A URL: www.esa.int/cryosat
CSG-1 COSMO-SkyMed Second Generation - 1 ASI / MiD (Italy)	Approved	Jun 2015	Jun 2022	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR-2000 S.G.	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it
CSG-2 COSMO-SkyMed Second Generation - 2 ASI / MiD (Italy)	Approved	Jun 2016	Jun 2023	Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications.	SAR-2000 S.G.	Type: Sun-synchronous Altitude: 620 km Period: 97.1 mins Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.asi.it
Diademe 1&2 CNES	Currently being flown	15 Feb 1967	Dec 2050	Geodetic measurements using satellite laser ranging.	RRA	Type: Inclined, non-sun-synchronous Altitude: 1200 km Period: 108 mins Inclination: 40 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: galileo.crl.go.jp/ilrs/diademe.html
DMSP F-14 Defense Meteorological Satellite Program F-14 NOAA / USAF	Currently being flown	04 Apr 1997	Dec 2013	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide atmospheric, oceanographic, solar-geophyscial, and cloud cover data on a daily basis.	OLS, SSM/I, SSM/T-1, SSM/T-2, SSB/X-2, SSI/ES-2, SSJ/4, SSM	Type: Sun-synchronous Altitude: 833 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: LST: 20:29 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DMSP F-15 Defense Meteorological Satellite Program F-15 NOAA / USAF	Currently being flown	12 Dec 1999	May 2013	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis. (Primary operational satellite).	OLS, SSM/I, SSM/T-1, SSM/T-2, SSI/ES-2, SSJ/4, SSM	Type: Sun-synchronous Altitude: 833 km Period: 101 mins Inclination: 98.9 deg Repeat cycle: LST: 20:29 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DMSP F-16 Defense Meteorological Satellite Program F-16 NOAA / USAF	Currently being flown	18 Oct 2003	Oct 2013	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis.	OLS, SSM/IS, SSM, SSI/ES-3, SSJ/5, SSULI, SSUSI	Type: Sun-synchronous Altitude: 833 km Period: 101 mins Inclination: 98.9 deg Repeat cycle: LST: 21:32 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DMSP F-17 Defense Meteorological Satellite Program F-17 NOAA / USAF	Currently being flown	04 Nov 2006	Jun 2013	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis.	OLS, SSM/IS, SSM, SSI/ES-3, SSULI, SSUSI	Type: Sun-synchronous Altitude: 850 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: LST: 17:31 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
DMSP F-18 Defense Meteorological Satellite Program F-18 NOAA / USAF	Currently being flown	18 Oct 2009	Apr 2014	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis.	OLS, SSM/IS, SSM, SSI/ES-3, SSULI, SSUSI	Type: Sun-synchronous Altitude: 850 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: LST: 17:31 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DMSP F-19 Defense Meteorological Satellite Program F-19 NOAA / USAF	Approved	Jan 2014	Jan 2019	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis.	OLS, SSM/IS, SSM, SSI/ES-3, SSULI, SSUSI	Type: Sun-synchronous Altitude: 833 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: LST: 17:31 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DMSP F-20 Defense Meteorological Satellite Program F-20 NOAA / USAF	Approved	Jan 2020	Jan 2025	The long-term meteorological programme of the US Department of Defense (DoD) - with the objective to collect and disseminate worldwide cloud cover data on a daily basis.	OLS, SSM/IS, SSM, SSI/ES-3, SSULI, SSUSI	Type: Sun-synchronous Altitude: 850 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: LST: 19:00 Longitude (if geo): Asc/desc: Ascending URL: dmsp.ngdc.noaa.gov/dmsp.html
DSCOVR Deep Space Climate Observatory NOAA / USAF / NASA	Approved	Jun 2014	Jul 2019	Measure a combination of solar phenomena and earth climate measurements. Provides 15 min warning for solar storms (CME) events. This mission is positioned at the Earth-Sun L-1 point.	NISTAR, EPIC, ES, PHA, Plasma-Mag	Type: Earth-Sun L-1 Altitude: Period: Inclination: Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: N/A URL:
EarthCARE ESA / JAXA	Approved	Nov 2015	Nov 2018	To Improve the understanding of atmospheric cloud–aerosol interactions and of the Earth's radiative balance towards enhancing climate and numerical weather prediction models. The 2 active and 2 passive instruments of EarthCARE make unique data product synergies possible.	CPR (EarthCARE), ATLID, BBR (EarthCARE), MSI (EarthCARE)	Type: Sun-synchronous Altitude: 393 km Period: Inclination: 97 deg Repeat cycle: 25 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.esa.int/export/esaLP/earthcare.html
Elektro-L N1 Geostationary Operational Meteorological Satellite - 1 ROSHYDROMET / ROSKOSMOS	Currently being flown	20 Jan 2011	Dec 2018	Hydrometeorology, heliogeophysics, climatology, DCS, S&R.	MSU-GS, DCS , GGAK-E, S&R	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -76 Asc/desc: N/A URL: planet.iitp.ru
Elektro-L N2 Geostationary Operational Meteorological Satellite - 2 ROSHYDROMET / ROSKOSMOS	Approved	Dec 2013	Nov 2018	Hydrometeorology, heliogeophysics, climatology, DCS, S&R.	MSU-GS, DCS , GGAK-E, S&R	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -76 Asc/desc: N/A URL: planet.iitp.ru
Elektro-L N3 Geostationary Operational Meteorological Satellite - 3 ROSHYDROMET / ROSKOSMOS	Planned	2015	2022	Hydrometeorology, heliogeophysics, climatology, DCS, S&R.	MSU-GS, DCS , GGAK-E, S&R	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 14.5 Asc/desc: N/A URL: planet.iitp.ru
EnMAP Environmental Mapping & Analysis Program DLR	Approved	Aug 2016	Jul 2021	Hyperspectral imaging, land surface, geological and environmental investigation.	HSI	Type: Sun-synchronous Altitude: 650 km Period: 97.5 mins Inclination: Repeat cycle: 21 days LST: 11:00 Longitude (if geo): Asc/desc: Descending URL: www.enmap.org/
Environsat-1 Environmental Satellite - 1 ISRO	Considered	2015	2019	Monitoring of greenhouse gases, aerosols and other atmospheric trace gases which are responsible for global warming.	HRSS-1, HRVS-1A/-1B	Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
Environsat-2 Environmental Satellite - 2 ISRO	Considered	2018	2022	Monitoring of greenhouse gases, aerosols and other atmospheric trace gases which are responsible for global warming.	HRSS-1, HRVS-1A/-1B	Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
EPS-SG-a EUMETSAT Polar System, second generation EUMETSAT / NOAA / DLR / EC / CNES / ESA	Planned	2019	2027	Meteorology, climatology. EPS-SG-a carries the Sentinel-5 mission. 3 satellites.	METimage, IASI-NG, 3MI, RO, MWS	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 29 days LST: Longitude (if geo): Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
EPS-SG-b EUMETSAT Polar System, second generation EUMETSAT / EC / ESA	Planned	2020	2028	Meteorology, climatology. 3 satellites.	RO, MWI, SCA, ICI, MWS	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Free Flyer-1 JPSS Free Flyer-1 NOAA / NASA	Planned	2016	2021	Spacecraft carrying TSIS and user services payloads not accomodated on JPSS 1 or 2	S&R (NOAA), TSIS, A-DCS4	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: 'www.nesdis.noaa.gov/jpss/
Free Flyer-2 JPSS Free Flyer-2 NOAA / NASA	Planned	2021	2026	Spacecraft carrying TSIS and user services payloads not accomodated on JPSS 1 or 2	S&R (NOAA), TSIS, A-DCS4	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: 'www.nesdis.noaa.gov/jpss/
FY-2D FY-2D Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Currently being flown	08 Dec 2006	Dec 2013	Meteorology and environmental monitoring; data collection and redistribution.	IVISSR (FY-2)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -86.5 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
FY-2E FY-2E Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Currently being flown	26 Dec 2008	Dec 2013	Meteorology and environmental monitoring; data collection and redistribution.	IVISSR (FY-2)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/
FY-2F FY-2F Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Currently being flown	13 Jan 2012	Dec 2016	Meteorology and environmental monitoring; data collection and redistribution.	IVISSR (FY-2)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
FY-2G FY-2G Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2013	2016	Meteorology and environmental monitoring; data collection and redistribution.		Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
FY-2H FY-2H Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2015	2018	Meteorology and environmental monitoring; data collection and redistribution.		Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
FY-3A FY-3A Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Currently being flown	27 May 2008	Dec 2013	Meteorology and environmental monitoring; data collection and redistribution.	IRAS, MWAS, MWHS, MWRI, VIRR, ERM, MERSI, MWTS, TOU/SBUS, SEM, SIM	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 10:10 Longitude (if geo): Asc/desc: Descending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3B FY-3B Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Currently being flown	05 Nov 2010	Dec 2013	Meteorology and environmental monitoring; data collection and redistribution. (Experimental pre-cursor to FY-3C).	IRAS, MWAS, MWHS, MWRI, VIRR, ERM, MERSI, MWTS, TOU/SBUS, SEM, SIM	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3C FY-3C Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Approved	Jul 2013	Jul 2016	Meteorology and environmental monitoring; data collection and redistribution. (Operational follow-on to FY-3B).	IRAS, IMWAS, MIRAS, MWRI, VIRR, ERM, MERSI, TOU/SBUS, SIM, MWHS-2, MWTS-2, SES, SIM-2	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3D FY-3D Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Approved	Dec 2014	Dec 2017	Meteorology and environmental monitoring; data collection and redistribution.	IMWAS, MIRAS, MWRI, ASI, GAMI, GNOS, MERSI-2, MWHS-2, MWTS-2, SES	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3E FY-3E Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Planned	2017	2020	Meteorology and environmental monitoring; data collection and redistribution.	IMWAS, MIRAS, SIM, ASI, ERM-2, GNOS, MERSI-2, MWHS-2, MWTS-2, OMS, SES, WindRAD, SIM-2	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3F FY-3F Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Planned	2019	2022	Meteorology and environmental monitoring; data collection and redistribution.	IMWAS, MIRAS, MVIRS, MWRI, ASI, GAMI, GNOS, MERSI-2, MWHS-2, MWTS-2, SES	Type: Sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98.753 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: fy3.satellite.cma.gov.cn/arssen/
FY-3G FY-3G Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC	Considered	2021	2024	Meteorology and environmental monitoring; data collection and redistribution.	IMWAS, MIRAS, MVIRS, ASI, ERM-2, GNOS, MERSI-2, MWHS-2, MWTS-2, OMS, WindRAD, SIM-2	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: fy3.satellite.cma.gov.cn/arssen/
FY-4A FY-4A Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Approved	Dec 2014	Dec 2017	Meteorology and environmental monitoring; data collection and redistribution.	LM, MCSI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/
FY-4B FY-4B Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2017	2020	Meteorology and environmental monitoring; data collection and redistribution.	LM, MCSI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/
FY-4C FY-4C Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2020	2023	Meteorology and environmental monitoring; data collection and redistribution.	LM, MCSI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/
FY-4D FY-4D Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2023	2026	Meteorology and environmental monitoring; data collection and redistribution.	LM, MCSI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/
FY-4E FY-4E Geostationary Meteorological Satellite NSMC-CMA / NRSCC	Planned	2026	2029	Meteorology and environmental monitoring; data collection and redistribution.	LM, MCSI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 Asc/desc: N/A URL: fy3.satellite.cma.gov.cn/arssen/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
GACM Global Atmospheric Composition Mission NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. Ozone and related gases for intercontinental air quality and stratospheric ozone layer prediction.	UV Spectrometer (GACM), IR Spectrometer(GACM), Microwave limb sounder (GACM)	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: decadal.gsfc.nasa.gov/gacm.html
GCOM-C1 Global Change Observation Mission-C1 JAXA	Approved	Dec 2015	Dec 2020	Understanding of climate change mechanism.	SGLI	Type: Sun-synchronous Altitude: 800 km Period: 98 mins Inclination: 98.6 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GCOM-C2 Global Change Observation Mission-C2 JAXA	Considered	2019	2024	Understanding of climate change mechanism.	SGLI	Type: Sun-synchronous Altitude: 800 km Period: 98 mins Inclination: 98.6 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GCOM-C3 Global Change Observation Mission-C3 JAXA	Considered	2023	2028	Understanding of climate change mechanism.	SGLI	Type: Sun-synchronous Altitude: 800 km Period: 98 mins Inclination: 98.6 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GCOM-W1 Global Change Observation Mission-W1 JAXA	Currently being flown	18 May 2012	May 2017	Understanding of water circulation mechanism.	AMSR-2	Type: Sun-synchronous Altitude: 700 km Period: 98 mins Inclination: 98.2 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GCOM-W2 Global Climate Observation Mission-W2 JAXA	Considered	2016	2021	Understanding of water circulation mechanism.	AMSR-2	Type: Sun-synchronous Altitude: 700 km Period: 98 mins Inclination: 98.2 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GCOM-W3 Global Change Observation Mission-W3 JAXA	Considered	2020	2025	Understanding of water circulation mechanism.	AMSR-2	Type: Sun-synchronous Altitude: 700 km Period: 98 mins Inclination: 98.2 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.jaxa.jp/projects/sat/gcom/index_e.html
GEO-CAPE Geostationary Coastal and Air Pollution Events NASA	Considered	2023	2026	Phase-2 DS Mission, launch order unknown, 3-year nominal mission. Atmospheric gas columns for air quality forecasts; ocean colour for coastal ecosystem health and climate emissions.	Event Imaging Spectrometer from GEO (GeoCape), IR Correlation Radiometer (GeoCape)	Type: Geostationary Altitude: 42000 km Period: Inclination: Repeat cycle: 1 days LST: Longitude (if geo): 80 Asc/desc: N/A URL: geo-cape.larc.nasa.gov/
GEO-KOMPSAT-2A Geostationary Korea Multi-Purpose Satellite-2A KARI	Approved	May 2017	Jan 2024	Korea's geostationary meteorological satellite series.	Advanced MI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -128.2 Asc/desc: N/A URL:
GEO-KOMPSAT-2B Geostationary Korea Multi-Purpose Satellite-2B KARI	Approved	May 2018	Apr 2025	Korea's geostationary oceanographic and environmental satellite.	Advanced GOCI, GEMS	Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
GISAT GEO HR IMAGER ISRO	Approved	Dec 2015	Dec 2024	Crop assessment, vegetation dynamics, drought assessment; quick monitoring of disasters, natural hazard and calamities, episodic events and short term events.	HRMX-VNIR, HYSI-SWIR, HYSI-VNIR, HRMX-TIR	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
GOCE Gravity Field and Steady-State Ocean Circulation Explorer ESA	Currently being flown	17 Mar 2009	Dec 2012	Research in steady-state ocean circulation, physics of Earth's interior and levelling systems (based on GPS). Will also provide unique data set required to formulate global and regional models of the Earth's gravity field and geoid.	EGG, Laser Reflectors (ESA), GPS (ESA), SSTI, LRR	Type: Sun-synchronous Altitude: 270 km Period: 90 mins Inclination: 96.7 deg Repeat cycle: 61 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: earth.esa.int/goce
GOES-12 Geostationary Operational Environmental Satellite - 12 NOAA	Currently being flown	23 Jul 2001	Oct 2013	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX.	DCS (NOAA), S&R (GOES), WEFAX, SXI, Sounder, Imager, GOES Comms, SEM (GOES), LRIT	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 60 Asc/desc: N/A URL: www.oso.noaa.gov/goes/
GOES-13 Geostationary Operational Environmental Satellite - 13 NOAA	Currently being flown	24 May 2006	Jun 2015	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX.	S&R (GOES), SXI, Sounder, Imager, GOES Comms, SEM (GOES), A-DCS4, LRIT	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 75 Asc/desc: N/A URL: www.oso.noaa.gov/goes
GOES-14 Geostationary Operational Environmental Satellite - 14 NOAA	Currently being flown	27 Jun 2009	Dec 2019	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX. On-orbit spare.	S&R (GOES), Sounder, Imager, GOES Comms, SEM (GOES), A-DCS4, LRIT	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 105 Asc/desc: N/A URL: www.oso.noaa.gov/goes/
GOES-15 Geostationary Operational Environmental Satellite - 15 NOAA	Currently being flown	04 Mar 2010	Jan 2017	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX.	S&R (GOES), SXI, Sounder, Imager, GOES Comms, SEM (GOES), A-DCS4, LRIT	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 135 Asc/desc: N/A URL: www.oso.noaa.gov/goes/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
GOES-R Geostationary Operational Environmental Satellite - R NOAA / NASA	Approved	Oct 2015	Mar 2025	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering.	ABI, GLM, Magnetometer (NOAA), EXIS, SEISS, SUVI, DCS (GOES-R)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.goes-r.gov/
GOES-S Geostationary Operational Environmental Satellite - S NOAA / NASA	Approved	Feb 2017	Oct 2028	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering.	ABI, GLM, Magnetometer (NOAA), EXIS, SEISS, SUVI, DCS (GOES-R)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.goes-r.gov/
GOES-T Geostationary Operational Environmental Satellite - T NOAA / NASA	Approved	Apr 2019	Jul 2033	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering.	ABI, GLM, Magnetometer (NOAA), EXIS, SEISS, SUVI, DCS (GOES-R)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.goes-r.gov/
GOES-U Geostationary Operational Environmental Satellite - U NOAA / NASA	Approved	Oct 2024	Oct 2038	Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering.	ABI, GLM, Magnetometer (NOAA), EXIS, SEISS, SUVI, DCS (GOES-R)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.goes-r.gov/
GOSAT Greenhouse gases Observing SATellite JAXA / MOE (Japan) / NIES (Japan)	Currently being flown	23 Jan 2009	Jan 2014	Observation of greenhouse gases.	TANSO-CAI, TANSO-FTS	Type: Sun-synchronous Altitude: 666 km Period: 98.18 mins Inclination: 98.06 deg Repeat cycle: 3 days LST: 13:00 Longitude (if geo): Asc/desc: Descending URL: www.jaxa.jp/projects/sat/gosat/index_e.html
GOSAT-2 Greenhouse gases Observing SATellite-2 JAXA / MOE (Japan) / NIES (Japan)	Considered	2016	2021	Observation of greenhouse gases.	TANSO-CAI-2, TANSO-FTS-2	Type: Altitude: 666 km Period: 98.18 mins Inclination: 98.06 deg Repeat cycle: LST: 13:00 Longitude (if geo): Asc/desc: Descending URL:
GPM Core Global Precipitation Measurement Mission Core spacecraft NASA / JAXA	Approved	Feb 2014	May 2017	3-year nominal mission life, 5-year goal. Study of global precipitation, evaporation, and cycling of water are changing. The mission comprises a primary spacecraft with active and passive microwave instruments, and a number of 'constellation spacecraft' with passive microwave instruments.	GMI, DPR	Type: Inclined, non-sun-synchronous Altitude: 407 km Period: 95 mins Inclination: 65 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: gpm.gsfc.nasa.gov
GRACE Gravity Recovery and Climate Experiment NASA / DLR	Currently being flown	17 Mar 2002	Sep 2013	5-year nominal mission life, currently in extended operations. Extremely high precision gravity measurements for use in construction of gravity field models. GRACE consists of two satellites (A, B) serving one mission.	GRACE instrument	Type: Inclined, non-sun-synchronous Altitude: 400 km Period: 94 mins Inclination: 89 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: www.csr.utexas.edu/grace/
GRACE FO Gravity Recovery and Climate Experiment - Follow-on NASA	Planned	2017	2022	5-year nominal mission life, currently in extended operations. Extremely high precision gravity measurements for use in construction of gravity field models. GRACE consists of two satellites (A, B) serving one mission.	GRACE instrument	Type: Inclined, non-sun-synchronous Altitude: 500 km Period: 90 mins Inclination: 89 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL:
GRACE-II Gravity Recovery and Climate Experiment NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. High temporal resolution gravity fields for tracking large scale water movement.	GRACE instrument	Type: Inclined, non-sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: eospso.gsfc.nasa.gov/eos_homepage/mission_profiles/show_mission.php?id=83
Himawari-8 JMA	Planned	2014	2029	Meteorology, environmental monitoring	AHI, Himawari Comms, Himawari DCS	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -140 Asc/desc: N/A URL: mscweb.kishou.go.jp/himawari89/index.html
Himawari-9 JMA	Planned	2016	2031	Meteorology, environmental monitoring	AHI, Himawari Comms, Himawari DCS	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -140 Asc/desc: N/A URL: mscweb.kishou.go.jp/himawari89/index.html
HJ-1A Disaster and Environment Monitoring and Forecast Small Satellite Constellation A CRESDA / CAST / NRSCC	Currently being flown	06 Sep 2008	Sep 2013	Disaster and environment monitoring and forecasting.	CCD (HJ), HSI (HJ-1A)	Type: Sun-synchronous Altitude: 649 km Period: Inclination: 97.9 deg Repeat cycle: 31 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.cresda.com/
HJ-1B Disaster and Environment Monitoring and Forecast Small Satellite Constellation B CRESDA / CAST / NRSCC	Currently being flown	06 Sep 2008	Sep 2013	Disaster and environment monitoring and forecasting.	CCD (HJ), IR (HJ-1B)	Type: Sun-synchronous Altitude: 649 km Period: Inclination: 97.9 deg Repeat cycle: 31 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.cresda.com/
HJ-1C Disaster and Environment Monitoring and Forecast Small Satellite Constellation C CRESDA / CAST / NRSCC	Approved	Nov 2012	Nov 2014	Disaster and environment monitoring and forecasting.	S-Band SAR	Type: Sun-synchronous Altitude: 499 km Period: Inclination: 97.3 deg Repeat cycle: 31 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: http:/www.cresda.com/
HY-2A Ocean dynamics satellite A NSOAS / CAST	Currently being flown	16 Aug 2011	Dec 2012	Detecting ocean surface temperature, wind field, wave and topography.	DORIS-NG, RAD, SCAT, ALT	Type: Sun-synchronous Altitude: 963 km Period: 104 mins Inclination: 99.3 deg Repeat cycle: 14 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.naoas.gov.cn/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
HY-2B Ocean dynamics satellite B NSOAS / CAST	Planned	2013	2016	Detecting ocean surface temperature, wind field, wave and topography.	RAD, SCAT, ALT	Type: Sun-synchronous Altitude: 963 km Period: Inclination: 99.3 deg Repeat cycle: 14 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.naoas.gov.cn/
HY-2C Ocean dynamics satellite C NSOAS / CAST	Planned	2015	2018	Detecting ocean surface temperature, wind field, wave and topography.	RAD, SCAT, ALT	Type: Sun-synchronous Altitude: 963 km Period: Inclination: 99.3 deg Repeat cycle: 14 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.naoas.gov.cn/
HY-2D Ocean dynamics satellite D NSOAS / CAST	Planned	2019	2022	Detecting ocean surface temperature, wind field, wave and topography.	RAD, SCAT, ALT	Type: Sun-synchronous Altitude: 963 km Period: Inclination: 99.3 deg Repeat cycle: 14 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.naoas.gov.cn/
HY-3A NSOAS / CAST	Planned	2015	2020	Ocean monitoring, environmental protection, coastal zone survey, etc.	WSAR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
HY-3B NSOAS / CAST	Planned	2017	2022	Ocean monitoring, environmental protection, coastal zone survey, etc.	WSAR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
HY-3C NSOAS / CAST	Planned	2022	2027	Ocean monitoring, environmental protection, coastal zone survey, etc.	WSAR	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
HyspIRI Hyperspectral Infrared Imager NASA	Considered	2020	2023	Phase-2 DS Mission, launch order unknown, 3-year nominal mission. Land surface composition for agriculture and mineral characterization; vegetation types for ecosystem health.	Visible imaging spectrometer (HyspIRI), Multi-spectral thermal infrared imager (HyspIRI)	Type: Sun-synchronous Altitude: 626 km Period: Inclination: 98 deg Repeat cycle: 19 days LST: 11:00 Longitude (if geo): Asc/desc: URL: hyspiri.jpl.nasa.gov/
ICESat-II Ice, Cloud, and Land Elevation Satellite II NASA	Planned	2016	2019	Mid-2016 launch expected (after SMAP), 3-year nominal mission life. Continue the assessment of polar ice changes and measure vegetation canopy heights, allowing estimates of biomass and carbon in aboveground vegetation in conjunction with related missions, and allow measurements of solid earth properties.	ATLAS	Type: Inclined, non-sun-synchronous Altitude: 500 km Period: 97 mins Inclination: 92 deg Repeat cycle: 183 days LST: Longitude (if geo): Asc/desc: TBD URL: icesat.gsfc.nasa.gov/index.php
IMS-1 Indian Mini Satellite-1 ISRO	Currently being flown	28 Apr 2008	Dec 2013	Micro-satellite for Third World countries for natural resources monitoring and management .	MxT, HySI (IMS-1)	Type: Sun-synchronous Altitude: 632 km Period: 97 mins Inclination: 97.92 deg Repeat cycle: 22 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL:
Ingenio CDTI / ESA	Approved	Jan 2014	Jan 2021	Cartography, land use, urban management, water management, agriculture and environmental monitoring, risk management and security.	PAN+MS (RGB+NIR), UVAS	Type: Sun-synchronous Altitude: 685 km Period: 98 mins Inclination: 98 deg Repeat cycle: 49 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL:
INSAT-3A Indian National Satellite - 3A ISRO	Currently being flown	04 Apr 2003	Apr 2013	Meteorology, data collection and communication, search and rescue.	VHRR, DRT-S&R, CCD camera	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -94 Asc/desc: N/A URL: www.isro.org/
INSAT-3D Indian National Satellite - 3D ISRO	Approved	Jun 2013	Jun 2020	Meteorology, data collection and communication, search and rescue.	Imager (INSAT), Sounder (INSAT)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -93.5 Asc/desc: N/A URL: www.isro.org/
INSAT-3DR Indian National Satellite - 3DR ISRO	Approved	Dec 2017	Dec 2024	Meteorology, data collection and communication, search and rescue.	Imager (INSAT), Sounder (INSAT)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -93.5 Asc/desc: N/A URL: www.isro.org/
INSAT-3DS Indian National Satellite - 3DS ISRO	Approved	Dec 2015	Dec 2022	Meteorology, data collection and communication, search and rescue.	Imager (INSAT), Sounder (INSAT)	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -93.5 Asc/desc: N/A URL: www.isro.org/
ISS/JEM International Space Station/Japanese Experiment Mo JAXA	Currently being flown	10 Sep 2009	Apr 2020	Scientific experiments on orbit.	SMILES	Type: Inclined, non-sun-synchronous Altitude: 407 km Period: 93 mins Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: iss.jaxa.jp/iss/index_e.html
Jason-1 NASA / CNES	Currently being flown	07 Dec 2001	Sep 2013	3-year nominal mission life, currently in extended operations. Physical oceanography, geodesy/gravity, climate monitoring, marine meteorology.	LRA, JMR, DORIS-NG, POSEIDON-2 (SSALT-2), TRSR	Type: Inclined, non-sun-synchronous Altitude: 1336 km Period: 112.4 mins Inclination: 66 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL: sealevel.jpl.nasa.gov/mission/jason-1.html

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
Jason-3 NASA / NOAA / CNES / EUMETSAT	Planned	2014	2017	3-year nominal mission life, currently in extended operations. Physical oceanography, geodesy/gravity, climate monitoring, marine meteorology.	LRA, AMR, GPSP, POSEIDON-3B	Type: Inclined, non-sun-synchronous Altitude: 1336 km Period: 112.4 mins Inclination: 66 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL:
JPSS-1 Joint Polar Satellite System - 1 NOAA / EUMETSAT / NASA	Approved	Jan 2017	Mar 2024	Meteorological, climatic, terrestrial, oceanographic, and solar-geophysical applications; global and regional environmental monitoring, search and rescue, data collection.	CrIS, CERES, VIIRS, ATMS, OMPS	Type: Sun-synchronous Altitude: 824 km Period: 101 mins Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.nesdis.noaa.gov/jpss/
JPSS-2 Joint Polar Satellite System - 2 NOAA / EUMETSAT / NASA	Approved	Feb 2023	Jul 2030	Meteorological, climatic, terrestrial, oceanographic, and solar-geophysical applications; global and regional environmental monitoring, search and rescue, data collection. Note that free-flyer options are being considered for the A-DCS4 and SARSAT instruments, though these are considered part of the JPSS system.	CrIS, VIIRS, ATMS, TSIS, OMPS, A-DCS4, ERBS	Type: Sun-synchronous Altitude: 833 km Period: 101 mins Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.nesdis.noaa.gov/jpss/
KALPANA-1 Meteorological Satellite ISRO	Currently being flown	12 Sep 2002	Dec 2013	Meteorological applications.	VHRR, DRT-S&R	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -83 Asc/desc: N/A URL: www.isro.org/insat2b.htm
Kanopus-V N1 Kanopus-V Environmental Satellite N1 ROSKOSMOS / ROSHYDROMET	Currently being flown	22 Jul 2012	Jul 2019	Land surface, disaster monitoring.	PSS, MSS (Kanonpus), MSU-200	Type: Sun-synchronous Altitude: 600 km Period: 98 mins Inclination: 98 deg Repeat cycle: 17 days LST: Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Kanopus-V N2 Kanopus-V Environmental Satellite N2 ROSKOSMOS / ROSHYDROMET	Considered	2013	2018	Land surface, disaster monitoring.	PSS, MSS (Kanonpus), MSU-200	Type: Sun-synchronous Altitude: 600 km Period: Inclination: 98 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
KOMPSAT-2 Korea Multi-Purpose Satellite -2 KARI	Currently being flown	27 Jul 2006	Jul 2013	Cartography, land use and planning, disaster monitoring.	MSC	Type: Sun-synchronous Altitude: 685 km Period: 98.5 mins Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: kompsat.kari.re.kr/english/index.asp
KOMPSAT-3 Korea Multi-Purpose Satellite -3 KARI / DLR	Currently being flown	18 May 2012	May 2016	Cartography, land use and planning, disaster monitoring.	AEISS	Type: Sun-synchronous Altitude: 685 km Period: 98.5 mins Inclination: Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: kompsat.kari.re.kr/english/index.asp
KOMPSAT-3A Korea Multi-Purpose Satellite -3A KARI / DLR	Approved	May 2014	May 2018	Cartography, land use and planning, disaster monitoring.	AEISS-A	Type: Sun-synchronous Altitude: 528 km Period: 98.5 mins Inclination: Repeat cycle: 28 days LST: Longitude (if geo): Asc/desc: Ascending URL:
KOMPSAT-5 Korea Multi-Purpose Satellite -5 KARI	Approved	Mar 2013	Mar 2017	Cartography, land use and planning, disaster monitoring.	COSI	Type: Sun-synchronous Altitude: 550 km Period: 98.5 mins Inclination: Repeat cycle: 28 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: kompsat.kari.re.kr/english/index.asp
L-band SAR NASA / CSA / ISRO	Considered	2021	2024	3-year mission to study solid earth deformation (earthquakes, volcanoes, landslides), changes in ice (glaciers, sea ice) and changes in vegetation biomass	L-band SAR	Type: Sun-synchronous Altitude: Period: 100 mins Inclination: Repeat cycle: 12 days LST: Longitude (if geo): Asc/desc: Ascending URL: desdyni.jpl.nasa.gov
LAGEOS-1 Laser Geodynamics Satellite - 1 ASI	Currently being flown	04 May 1976	May 2016	Geodesy, crustal motion and gravity field measurements by laser ranging.	LRA (LAGEOS)	Type: Inclined, non-sun-synchronous Altitude: 5900 km Period: 226 mins Inclination: 110 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.asi.it
LAGEOS-2 Laser Geodynamics Satellite - 2 ASI	Currently being flown	22 Oct 1992	Oct 2032	Geodesy, crustal motion and gravity field measurements by laser ranging.	LRA (LAGEOS)	Type: Inclined, non-sun-synchronous Altitude: 5800 km Period: 223 mins Inclination: 52.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.asi.it
Landsat-5 USGS / NASA	Currently being flown	01 Mar 1984	Dec 2012	Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover.	MSS (Landsat), TM	Type: Sun-synchronous Altitude: 705 km Period: 98.9 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: landsat.usgs.gov/
Landsat-7 USGS / NASA	Currently being flown	15 Apr 1999	Jan 2017	5-year nominal mission life, currently in extended operations. Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover.	ETM+	Type: Sun-synchronous Altitude: 705 km Period: 98.9 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:05 Longitude (if geo): Asc/desc: Descending URL: landsat.usgs.gov/
LARES LAser RElativity Satellite ASI	Currently being flown	13 Feb 2012	Feb 2052	Scientific objectives are the measurement of the dragging of inertial frames due to the Earth's angular momentum, or Lense-Thirring effect, and a high precision test of the Earth's gravitomagnetic field with accuracy of the order of a few percent. Gravitomagnetic field and dragging of inertial frames are predictions of Einstein's theory of General Relativity. In addition, LARES will allow other measurements in geodesy and geodynamics.	LCCRA	Type: Inclined, non-sun-synchronous Altitude: 1450 km Period: 99.1 mins Inclination: 71 deg Repeat cycle: LST: Not defined Longitude (if geo): Asc/desc: Ascending URL: www.asi.it

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
LDCM Landsat Data Continuity Mission NASA / USGS	Approved	Feb 2013	May 2018	5-year nominal mission life. Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover.	OLI, TIRS	Type: Sun-synchronous Altitude: 705 km Period: 99 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: ldcm.nasa.gov/
LIST Lidar Surface Topography NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. Land surface topography for landslide hazards and water runoff.	Laser altimeter (LIST)	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 365 days LST: Longitude (if geo): Asc/desc: URL: decadal.gsfc.nasa.gov/list.html
MEGHA-TROPIQUES CNES / ISRO	Currently being flown	12 Oct 2011	Jan 2015	Study of the inter-tropical zone and its convective systems (water and energy cycles).	ScaRaB, SAPHIR, MADRAS, ROSA	Type: Inclined, non-sun-synchronous Altitude: 867 km Period: 102.16 mins Inclination: 20 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: smsc.cnes.fr/MEGHAT/
MERLIN Methane Remote Sensing Lidar Mission CNES / DLR	Planned	2016	2019	Global atmospheric methane concentration.	IPDA LIDAR	Type: Sun-synchronous Altitude: 500 km Period: 90 mins Inclination: Repeat cycle: 28 days LST: Longitude (if geo): Asc/desc: Ascending URL: www.dlr.de/rd/desktopdefault.aspx/tabid-2440/3586_read-31672/
Meteor-M N1 Meteor-M N1 Meteorological Satellite ROSHYDROMET / ROSKOSMOS	Currently being flown	17 Sep 2009	Sep 2014	Hydrometeorology, climatology, heliogeophysics, DCS.	MTVZA, MSU-MR, DCS , KMSS, GGAK-M, Severjanin	Type: Sun-synchronous Altitude: 820 km Period: 102 mins Inclination: 98.79 deg Repeat cycle: 37 days LST: 09:30 Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Meteor-M N2 Meteor-M Meteorological Satellite N2 ROSHYDROMET / ROSKOSMOS	Approved	Feb 2013	Feb 2018	Hydrometeorology, climatology, heliogeophysics, DCS.	MTVZA, IKFS-2, MSU-MR, DCS , KMSS, GGAK-M, Severjanin	Type: Sun-synchronous Altitude: 835 km Period: 102 mins Inclination: 98.7 deg Repeat cycle: 37 days LST: 09:30 Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Meteor-M N2-1 Meteor-M Meteorological Satellite N2-1 ROSHYDROMET / ROSKOSMOS	Approved	Dec 2014	Dec 2019	Hydrometeorology, climatology, heliogeophysics, DCS.	MTVZA, IKFS-2, MSU-MR, DCS , KMSS, GGAK-M, Severjanin	Type: Sun-synchronous Altitude: 835 km Period: 102 mins Inclination: 98.7 deg Repeat cycle: 37 days LST: TBD Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Meteor-M N2-2 Meteor-M Meteorological Satellite N2-2 ROSHYDROMET / ROSKOSMOS	Approved	Dec 2015	Dec 2020	Hydrometeorology, climatology, heliogeophysics, DCS.	MTVZA, IKFS-2, MSU-MR, DCS , KMSS, GGAK-M, Severjanin	Type: Sun-synchronous Altitude: 835 km Period: 102 mins Inclination: 98.7 deg Repeat cycle: 37 days LST: TBD Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Meteor-M N3 Meteor-M Oceanographical Satellite N3 ROSHYDROMET / ROSKOSMOS	Approved	Dec 2015	Dec 2020	Oceanography, hydrometeorology, climatology.	DCS , SAR, Radiomet, OCS, CZS, Scatterometer (Meteor)	Type: Sun-synchronous Altitude: 835 km Period: 102 mins Inclination: 98.7 deg Repeat cycle: 37 days LST: TBD Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Meteor-MP N1 Meteor-MP Meteorological Satellite N1 ROSHYDROMET / ROSKOSMOS	Planned	2014	2019	Hydrometeorology, climatology, heliogeophysics, DCS.	Advanced MSU-MR, Advanced KMSS, Advanced IKFS-2, Advanced MTVZA, Advanced Scatterometer , Advanced SAR , Advanced Radiomet, Advanced DCS , Advanced GGAK-M, TGSP	Type: Sun-synchronous Altitude: 830 km Period: Inclination: 98.7 deg Repeat cycle: LST: 21:30 Longitude (if geo): Asc/desc: URL: planet.iitp.ru
Meteor-MP N2 Meteor-MP Meteorological Satellite N2 ROSHYDROMET / ROSKOSMOS	Planned	2015	2020	Hydrometeorology, climatology, heliogeophysics, DCS.	Advanced MSU-MR, Advanced KMSS, Advanced IKFS-2, Advanced MTVZA, Advanced Scatterometer , Advanced SAR , Advanced Radiomet, Advanced DCS , Advanced GGAK-M, TGSP	Type: Sun-synchronous Altitude: 836 km Period: Inclination: 98.7 deg Repeat cycle: LST: 9:30 Longitude (if geo): Asc/desc: URL: planet.iitp.ru
Meteor-MP N3 Meteor-MP Meteorological Satellite N3 ROSHYDROMET / ROSKOSMOS	Planned	2016	2021	Hydrometeorology, climatology, heliogeophysics, DCS.	Advanced MSU-MR, Advanced KMSS, Advanced IKFS-2, Advanced MTVZA, Advanced Scatterometer , Advanced SAR , Advanced Radiomet, Advanced DCS , Advanced GGAK-M, TGSP	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: planet.iitp.ru
Meteosat-10 Meteosat Second Generation-3 EUMETSAT / ESA	Currently being flown	05 Jul 2012	Jun 2020	Meteorology, climatology, atmospheric dynamics/water and energy cycles. Meteosat 1-7 are first generation. Meteosat 8-11 are second generation and known as MSG in the development phase.	MSG Comms, SEVIRI, GERB	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Meteosat-11 Meteosat Second Generation-4 EUMETSAT / ESA	Approved	Jan 2015	Jan 2023	Meteorology, climatology, atmospheric dynamics/water and energy cycles. Meteosat 1-7 are first generation. Meteosat 8-11 are second generation and known as MSG in the development phase.	MSG Comms, SEVIRI, GERB	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Meteosat-7 EUMETSAT / ESA	Currently being flown	03 Sep 1997	Dec 2016	Meteorology, climatology, atmospheric dynamics/water and energy cycles. Meteosat 1-7 are first generation. Meteosat 8-11 are second generation and known as MSG in the development phase.	Meteosat Comms, MVIRI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
Meteosat-8 Meteosat Second Generation-1 EUMETSAT / ESA	Currently being flown	13 Aug 2002	Dec 2019	Meteorology, climatology, atmospheric dynamics/water and energy cycles. Meteosat 1-7 are first generation. Meteosat 8-11 are second generation and known as MSG in the development phase.	MSG Comms, SEVIRI, GERB	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Meteosat-9 Meteosat Second Generation-2 EUMETSAT / ESA	Currently being flown	21 Dec 2005	Dec 2021	Meteorology, climatology, atmospheric dynamics/water and energy cycles. Meteosat 1-7 are first generation. Meteosat 8-11 are second generation and known as MSG in the development phase.	MSG Comms, SEVIRI, GERB	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Metop-A Meteorological Operational Polar Satellite - A EUMETSAT / ESA	Currently being flown	19 Oct 2006	Dec 2013	Meteorology, climatology.	SEM (POES), ARGOS, S&R (NOAA), MHS, IASI, GRAS, GOME-2, ASCAT, AMSU-A, AVHRR/3, HIRS/4	Type: Sun-synchronous Altitude: 840 km Period: 107.1 mins Inclination: 98.8 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Metop-B Meteorological Operational Polar Satellite - B EUMETSAT / ESA	Currently being flown	17 Sep 2012	Sep 2017	Meteorology, climatology.	SEM (POES), ARGOS, S&R (NOAA), MHS, IASI, GRAS, GOME-2, ASCAT, AMSU-A, AVHRR/3, HIRS/4	Type: Sun-synchronous Altitude: 840 km Period: 101.7 mins Inclination: 98.8 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
Metop-C Meteorological Operational Polar Satellite - C EUMETSAT / ESA	Approved	Apr 2016	Dec 2021	Meteorology, climatology.	SEM (POES), ARGOS, MHS, IASI, GRAS, GOME-2, ASCAT, AMSU-A, AVHRR/3, A-DCS4	Type: Sun-synchronous Altitude: 840 km Period: 101.7 mins Inclination: 98.8 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MIOSAT Piccola MIssione Ottica basata su microSATellite ASI	Approved	Jun 2014	Jun 2016	Land surface, agriculture and forestry, regional geology, land use studies, water resources, vegetation studies, coastal studies and soils and main atmospheric gases detection.	PAN CAM, ALISEO, Mach-Zehnder Micro-interferometer	Type: Sun-synchronous Altitude: 615 km Period: 97 mins Inclination: 97.9 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.asi.it/en/activity/earth_observation/miosat_
MTG-I1 (imaging) Meteosat Third Generation - Imaging Satellite 1 EUMETSAT / ESA	Approved	Dec 2018	Jun 2026	Meteorology, climatology, Atmospheric dynamics/water and energy cycles.	FCI, LI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTG-I2 (imaging) Meteosat Third Generation - Imaging Satellite 2 EUMETSAT / ESA	Approved	Jun 2022	Jan 2031	Meteorology, climatology, Atmospheric dynamics/water and energy cycles.	FCI, LI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTG-I3 (imaging) Meteosat Third Generation - Imaging Satellite 3 EUMETSAT / ESA	Approved	Jan 2026	Jul 2034	Meteorology, climatology, Atmospheric dynamics/water and energy cycles.	FCI, LI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTG-I4 (imaging) Meteosat Third Generation - Imaging Satellite 4 EUMETSAT / ESA	Approved	Jun 2031	Dec 2038	Meteorology, climatology, Atmospheric dynamics/water and energy cycles.	FCI, LI	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTG-S1 (sounding) Meteosat Third Generation S1 Sounding Satellite 1 EUMETSAT / EC / ESA	Approved	Jun 2020	Dec 2027	Supporting European atmospheric composition and air quality monitoring services. MTG S1 carries the Sentinel-4 A mission.	UVN, IRS	Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTG-S2 (sounding) Meteosat Third Generation S2 Sounding Satellite 2 EUMETSAT / EC / ESA	Approved	Jan 2028	Aug 2035	Supporting European atmospheric composition and air quality monitoring services. MTG S2 carries the Sentinel-4 B mission.	UVN, IRS	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.eumetsat.int/Home/Main/Satellites/index.htm?l=en?
MTSAT-1R Multi-functional Transport Satellite JMA / JCAB	Currently being flown	26 Feb 2005	Jan 2015	Meteorology, aeronautical applications. As of 2010 satellite on stand-by operational.	MTSAT Comms, JAMI/MTSAT-1R, MTSAT DCS	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -140 Asc/desc: N/A URL:
MTSAT-2 Multi-functional Transport Satellite JMA / JCAB	Currently being flown	18 Feb 2006	Jan 2017	Meteorology, aeronautical applications.	IMAGER/MTSAT-2, MTSAT Comms, MTSAT DCS	Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -145 Asc/desc: N/A URL:
NigeriaSat-2 NASRDA	Currently being flown	17 Aug 2011	Aug 2018	Small satellite mission with technical and scientific objectives (environmental) monitoring.	NigeriaSat Medium and High Resolution	Type: Sun-synchronous Altitude: 700 km Period: 97 mins Inclination: 98 deg Repeat cycle: 4 days LST: Longitude (if geo): Asc/desc: Descending URL: www.nasrda.net

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
NigeriaSat-X NASRDA	Currently being flown	17 Aug 2011	Aug 2018	Small satellite mission with technical and scientific objectives (capability demonstration).	NigeriaSat Medium Resolution	Type: Sun-synchronous Altitude: 700 km Period: 97 mins Inclination: 98 deg Repeat cycle: LST: 10:15 Longitude (if geo): Asc/desc: Descending URL: www.nasrda.net
NMP EO-1 New Millenium Program Earth Observing-1 NASA	Currently being flown	21 Nov 2000	Sep 2013	1.5-year nominal mission life, currently in extended operations. Land surface, earth resources.	ALI, Hyperion, LEISA AC	Type: Sun-synchronous Altitude: 690 km Period: 99 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: eo1.gsfc.nasa.gov/
NOAA-15 National Oceanic and Atmospheric Administration - 15 NOAA	Currently being flown	01 May 1998	Dec 2013	Meteorology, agriculture and forestry, environmental monitoring, climatology, physical oceanography, volcanic eruption monitoring, ice and snow cover, total ozone studies, space environment, solar flux analysis, search and rescue.	ARGOS, S&R (NOAA), ATOVS (HIRS/3 + AMSU + AVHRR/3), AMSU-A, HIRS/3, AMSU-B, AVHRR/3, NOAA Comms	Type: Sun-synchronous Altitude: 813 km Period: 101.4 mins Inclination: 98.6 deg Repeat cycle: LST: 7:08 Longitude (if geo): Asc/desc: Descending URL: www.oso.noaa.gov/poes/
NOAA-16 National Oceanic and Atmospheric Administration - 16 NOAA	Currently being flown	21 Sep 2000	Dec 2013	Meteorology, agriculture and forestry, environmental monitoring, climatology, physical oceanography, volcanic eruption monitoring, ice and snow cover, total ozone studies, space environment, solar flux analysis, search and rescue.	SEM (POES), ARGOS, S&R (NOAA), ATOVS (HIRS/3 + AMSU + AVHRR/3), AMSU-A, HIRS/3, SBUV/2, AMSU-B, AVHRR/3, NOAA Comms	Type: Sun-synchronous Altitude: 870 km Period: 102 mins Inclination: 98.8 deg Repeat cycle: LST: 13:54 Longitude (if geo): Asc/desc: Ascending URL: www.oso.noaa.gov/poes/
NOAA-17 National Oceanic and Atmospheric Administration - 17 NOAA	Currently being flown	24 Jun 2002	Dec 2014	Meteorology, agriculture and forestry, environmental monitoring, climatology, physical oceanography, volcanic eruption monitoring, ice and snow cover, total ozone studies, space environment, solar flux analysis, search and rescue.	SEM (POES), ARGOS, S&R (NOAA), AMSU-A, HIRS/3, SBUV/2, AMSU-B, AVHRR/3, NOAA Comms	Type: Sun-synchronous Altitude: 833 km Period: 101.4 mins Inclination: 98.75 deg Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: www.oso.noaa.gov/poes/
NOAA-18 National Oceanic and Atmospheric Administration - 18 NOAA	Currently being flown	20 May 2005	Dec 2015	Meteorology, agriculture and forestry, environmental monitoring, climatology, physical oceanography, volcanic eruption monitoring, ice and snow cover, total ozone studies, space environment, solar flux analysis, search and rescue.	SEM (POES), ARGOS, S&R (NOAA), MHS, AMSU-A, SBUV/2, AVHRR/3, NOAA Comms, HIRS/4	Type: Sun-synchronous Altitude: 870 km Period: 102.1 mins Inclination: 98.75 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: www.oso.noaa.gov/poes/
NOAA-19 National Oceanic and Atmospheric Administration - 19 NOAA	Currently being flown	04 Feb 2009	Mar 2016	Meteorology, agriculture and forestry, environmental monitoring, climatology, physical oceanography, volcanic eruption monitoring, ice and snow cover, total ozone studies, space environment, solar flux analysis, search and rescue.	SEM (POES), ARGOS, S&R (NOAA), MHS, SBUV/2, AVHRR/3, NOAA Comms, HIRS/4, A-DCS4, LRIT	Type: Sun-synchronous Altitude: 870 km Period: 102.1 mins Inclination: 98.75 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: www.oso.noaa.gov/poes/
OCEANSAT-2 Ocean Satellite-2 ISRO	Currently being flown	24 Sep 2009	Sep 2014	Ocean and atmosphere applications.	OCM, Scatterometer (OCEANSAT), ROSA	Type: Sun-synchronous Altitude: 720 km Period: 99.31 mins Inclination: 98.28 deg Repeat cycle: 2 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
OCEANSAT-3 Ocean Satellite-3 ISRO	Considered	2014	2019	Ocean and atmosphere applications.	TIR (Oceansat-3/3A), OCM (Oceansat-3/3A)	Type: Sun-synchronous Altitude: 720 km Period: 99.31 mins Inclination: 98.28 deg Repeat cycle: 2 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
OCEANSAT-3A Ocean Satellite-3A ISRO	Considered	2018	2023	Ocean and atmosphere applications.	TIR (Oceansat-3/3A), OCM (Oceansat-3/3A)	Type: Sun-synchronous Altitude: 720 km Period: 99.31 mins Inclination: 98.28 deg Repeat cycle: 2 days LST: Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
OCO-2 Orbiting Carbon Observatory-2 NASA	Approved	Jul 2014	Oct 2017	High resolution carbon dioxide measurements to characterize sources and sinks on regional scales and quantify their variability over the seasonal cycle.	Spectrometer (OCO-2)	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: LST: 13:25 Longitude (if geo): Asc/desc: Ascending URL: oco.jpl.nasa.gov/
Odin SNSB / TEKES / CNES / CSA	Currently being flown	20 Feb 2001	Dec 2012	Atmospheric research, stratospheric ozone chemistry, mesospheric ozone science, summer mesospheric science.	OSIRIS, SMR	Type: Sun-synchronous Altitude: 590 km Period: 97.6 mins Inclination: 97.8 deg Repeat cycle: LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.ssc.se/?id=7180
Ørsted (Oersted) DNSC / CNES	Currently being flown	21 Nov 1999	Dec 2012	Earth magnetic field mapping.	Overhauser Magnetometer, CSC FVM, SI, GPSRO (Oersted)	Type: Inclined, non-sun-synchronous Altitude: 655 km Period: 100 mins Inclination: 96.5 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: web.dmi.dk/projects/oersted/
OSTM (Jason-2) Ocean Surface Topography Mission NASA / NOAA / CNES / EUMETSAT	Currently being flown	20 Jun 2008	Dec 2013	3-year nominal mission life. Physical oceanography, geodesy/gravity, climate monitoring, marine meteorology.	LRA, JMR, DORIS-NG, POSEIDON-3, AMR, GPSP	Type: Inclined, non-sun-synchronous Altitude: 1336 km Period: 112.4 mins Inclination: 66 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL: sealevel.jpl.nasa.gov/mission/ostm.html
PACE Pre-Aerosol, Cloud, and ocean Ecosystems NASA	Considered	2019	2022	Phase-2 DS Mission, launch order unknown, 3-year nominal mission. Aerosol and cloud profiles for climate and water cycle; ocean colour for open ocean biogeochemistry.	Next Gen APS (ACE), OES, Polarimeter	Type: Sun-synchronous Altitude: 650 km Period: Inclination: 97 deg Repeat cycle: 16 days LST: 12:00 Longitude (if geo): Asc/desc: Ascending URL: decadal.gsfc.nasa.gov/PACE.html
PARASOL Polarization and Anisotropy of Reflectances for Atmospheric Science coupled with Observations from a LIDAR CNES	Currently being flown	18 Dec 2004	Dec 2013	Micro-satellite with the aim of characterisation of the clouds and aerosols microphysical and radiative properties, needed to understand and model the radiative impact of clouds and aerosols.	POLDER-P	Type: Sun-synchronous Altitude: 705 km Period: 98.8 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: TBD URL: smsc.cnes.fr/PARASOL/index.htm

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
PATH Precipitation and All-weather Temperature and Humidity NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. High frequency, all-weather temperature and humidity soundings for weather forecasting and SST.	GeoSTAR	Type: Geostationary Altitude: 42000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: decadal.gsfc.nasa.gov/path.html
PAZ CDTI	Approved	Dec 2013	Dec 2018	Security, land use, urban management, environmental monitoring, risk management.	Paz SAR-X	Type: Sun-synchronous Altitude: 514 km Period: 95 mins Inclination: 97.44 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.hisdesat.es
PCW-1 Polar Communications and Weather-1 CSA	Planned	2018	2028	Continuous meteorological observation and communications service to the Arctic.	PCWMP, PCW PHEOS - Solar-Terrestrial, PCW PHEOS - Atmospheric	Type: Highly elliptical Altitude: Period: 718 mins Inclination: 63.4 deg Repeat cycle: 1 days LST: N/A Longitude (if geo): Asc/desc: N/A URL: www.asc-csa.gc.ca/eng/satellites/pcw/default.asp
PCW-2 Polar Communications and Weather-2 CSA	Planned	2018	2028	Continuous meteorological observation and communications service to the Arctic.	PCWMP, PCW PHEOS - Solar-Terrestrial, PCW PHEOS - Atmospheric	Type: Highly elliptical Altitude: Period: 718 mins Inclination: 63.4 deg Repeat cycle: 1 days LST: N/A Longitude (if geo): Asc/desc: N/A URL: www.asc-csa.gc.ca/eng/satellites/pcw/default.asp
PICARD CNES	Currently being flown	15 Jun 2010	Jun 2013	Simultaneous measurements of solar diameter, differential rotation, solar constant, and variability.	SODISM, SOVAP, PREMOS	Type: TBD Altitude: 725 km Period: 99 mins Inclination: 98 deg Repeat cycle: LST: 6:00 Longitude (if geo): Asc/desc: TBD URL: smsc.cnes.fr/PICARD/
Pleiades 1A CNES	Currently being flown	17 Dec 2011	Dec 2016	Cartography, land use, risk, agriculture and forestry, civil planning and mapping, digital terrain models, defence.	HiRI	Type: Sun-synchronous Altitude: 694 km Period: Inclination: Repeat cycle: 26 days LST: 10:15 Longitude (if geo): Asc/desc: Descending URL: smsc.cnes.fr/PLEIADES/Fr/index.htm
Pleiades 1B CNES	Approved	Nov 2012	Dec 2017	Cartography, land use, risk, agriculture and forestry, civil planning and mapping, digital terrain models, defence.	HiRI	Type: Sun-synchronous Altitude: 694 km Period: Inclination: Repeat cycle: LST: 10:15 Longitude (if geo): Asc/desc: Descending URL: smsc.cnes.fr/PLEIADES/Fr/index.htm
PRISMA PRecursore IperSpettrale della Missione Applicativa ASI	Approved	Jun 2014	Jun 2019	Land surface, agriculture and forestry, regional geology, land use studies, water resources, vegetation studies, coastal studies and soils.	HYC, PAN CAMERA	Type: Sun-synchronous Altitude: 615 km Period: 97 mins Inclination: 97.9 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.asi.it/en/activity/earth_observation/prisma_
PROBA Project for On-Board Autonomy ESA	Currently being flown	22 Oct 2001	Dec 2012	PROBA is a technology experiment to demonstrate the on-board autonomy of a generic platform suitable for small scientific or application missions. A number of earth observation instruments are included. CHRIS - a hyperspectral imager provides data related to Earth Resources science and applications.	CHRIS	Type: Sun-synchronous Altitude: 615 km Period: 96.97 mins Inclination: 97.9 deg Repeat cycle: 7 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: earth.esa.int/proba/
QuikSCAT Quick Scatterometer NASA	Currently being flown	19 Jun 1999	Sep 2013	The 3-year nominal QuikSCAT mission life is complete, and it is currently in extended operations. Due to technical failure (the antenna stopped rotating in November 2009), and the instrument no longer collects ocean wind vector data. However it still provides calibration data for other on-orbit scatterometers, which enables the continuation of a climate-quality wind vector dataset. The 2011 NASA Senior Review panel strongly endorsed the continuation of the mission with these modified objectives through 2013.	SeaWinds	Type: Sun-synchronous Altitude: 803 km Period: 101 mins Inclination: 98.6 deg Repeat cycle: LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: winds.jpl.nasa.gov/missions/quikscat/index.cfm
RADARSAT C-1 RADARSAT CONSTELLATION-1 CSA	Approved	Aug 2016	Dec 2023	Ecosystem monitoring, maritime surveillance, disaster management.	SAR (RCM), AIS (RCM)	Type: Sun-synchronous Altitude: 600 km Period: 96.4 mins Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp
RADARSAT C-2 RADARSAT CONSTELLATION-2 CSA	Approved	Dec 2017	Mar 2025	Ecosystem monitoring, maritime surveillance, disaster management.	SAR (RCM), AIS (RCM)	Type: Sun-synchronous Altitude: 600 km Period: 96.4 mins Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp
RADARSAT C-3 RADARSAT CONSTELLATION-3 CSA	Approved	Dec 2017	Mar 2025	Ecosystem monitoring, maritime surveillance, disaster management.	SAR (RCM), AIS (RCM)	Type: Sun-synchronous Altitude: 600 km Period: 96.4 mins Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp
RADARSAT-1 CSA	Currently being flown	04 Nov 1995	Mar 2015	Environmental monitoring, physical oceanography, ice and snow, land surface.	SAR (RADARSAT)	Type: Sun-synchronous Altitude: 798 km Period: 100.7 mins Inclination: 98.594 deg Repeat cycle: 24 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.asc-csa.gc.ca/eng/satellites/radarsat1/default.asp
RADARSAT-2 CSA	Currently being flown	14 Dec 2007	Apr 2015	Environmental monitoring, physical oceanography, ice and snow, land surface. Note: Ownership of RADARSAT-2 has been transferred to MDA Corporation. CSA investment in the project is paid back with the data generated by the satellite since it entered operations.	SAR (RADARSAT-2)	Type: Sun-synchronous Altitude: 798 km Period: 100.7 mins Inclination: 98.6 deg Repeat cycle: 24 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.asc-csa.gc.ca/eng/satellites/radarsat2/default.asp
RapidEye DLR	Currently being flown	29 Aug 2008	Aug 2015	System of 5 satellites for cartography, land surface, digital terrain models, disaster management, environmental monitoring.	MSI	Type: Sun-synchronous Altitude: 622 km Period: 97 mins Inclination: 98.7 deg Repeat cycle: 1 days LST: 11:00 Longitude (if geo): Asc/desc: Descending URL: www.rapideye.de/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
RASAT RASAT Remote Sensing Satellite TUBITAK	Currently being flown	17 Aug 2011	Aug 2014	Cartography, land cover/land use, city planning, disaster mitigation/monitoring, environmental monitoring.	RASAT VIS Panchromatic, RASAT VIS Multispectral	Type: Sun-synchronous Altitude: 700 km Period: 98.8 mins Inclination: 98.21 deg Repeat cycle: 4 days LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: www.uzay.tubitak.gov.tr/
RESOURCESAT-1 Resource Satellite-1 ISRO	Currently being flown	17 Oct 2003	Dec 2013	Natural resources management, agricultural applications, forestry, etc.	AWiFS, LISS-IV, LISS-III (Resourcesat)	Type: Sun-synchronous Altitude: 817 km Period: 102 mins Inclination: 98.72 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RESOURCESAT-2 Resource Satellite-2 ISRO	Currently being flown	20 Apr 2011	Apr 2016	Natural resources management, agricultural applications, forestry, etc.	AWiFS, LISS-IV, LISS-III (Resourcesat)	Type: Sun-synchronous Altitude: 817 km Period: 102 mins Inclination: 98.72 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RESOURCESAT-2A Resource Satellite-2A ISRO	Considered	2015	2020	Natural resources management, agricultural applications, forestry, etc.	AWiFS, LISS-IV, LISS-III (Resourcesat)	Type: Sun-synchronous Altitude: 817 km Period: 102 mins Inclination: 98.72 deg Repeat cycle: 26 days LST: Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RESOURCESAT-3 Resource Satellite-3 ISRO	Considered	2015	2020	Natural resources management, agricultural applications, forestry, etc.	WS LISS III, ATCOR	Type: Sun-synchronous Altitude: 817 km Period: 102 mins Inclination: 98.72 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RESOURCESAT-3A Resource Satellite-3A ISRO	Considered	2018	2023	Natural resources management, agricultural applications, forestry, etc.	WS LISS III, ATCOR	Type: Sun-synchronous Altitude: 817 km Period: 102 mins Inclination: 98.72 deg Repeat cycle: 26 days LST: Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
Resurs DK 1 Resurs DK Environmental Satellite 1 ROSKOSMOS / ROSHYDROMET	Currently being flown	15 Jun 2006	Dec 2013	Land surface.	Geoton-L1, Pamela, Arina	Type: Inclined, non-sun-synchronous Altitude: 600 km Period: 92 mins Inclination: 70 deg Repeat cycle: 17 days LST: Longitude (if geo): Asc/desc: Ascending URL: planet.iitp.ru
Resurs P N1 Resurs P Environmental Satellite N1 ROSKOSMOS / ROSHYDROMET	Approved	May 2013	May 2018	Land surface.	Geoton-L1, Pamela, Arina	Type: Altitude: 600 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
Resurs P N2 Resurs P Environmental Satellite N2 ROSKOSMOS / ROSHYDROMET	Planned	2013	2018	Land surface.	Geoton-L1, Pamela, Arina	Type: Altitude: 600 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
RISAT-1 Radar Imaging Satellite ISRO	Currently being flown	26 Apr 2012	Apr 2016	Land surface, agriculture and forestry, regional geology, land use studies, water resources, vegetation studies, coastal studies and soils - especially during cloud season.	SAR (RISAT)	Type: Sun-synchronous Altitude: 610 km Period: 96.5 mins Inclination: 97.844 deg Repeat cycle: 12 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RISAT-1A Radar Imaging Satellite ISRO	Considered	2015	2019	Land surface, agriculture and forestry, regional geology, land use studies, water resources, vegetation studies, coastal studies and soils - especially during cloud season.	SAR (RISAT)	Type: Sun-synchronous Altitude: 610 km Period: 96.5 mins Inclination: 97.844 deg Repeat cycle: 12 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
RISAT-2 Radar Imaging Satellite ISRO	Currently being flown	20 Apr 2009	Apr 2013	For research and disaster management applications purpose.	SAR-X	Type: Sun-synchronous Altitude: 609 km Period: 97.6 mins Inclination: 96 deg Repeat cycle: LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: www.isro.org/
RISAT-3 Radar Imaging Satellite ISRO	Considered	2016	2021	Land surface, agriculture and forestry, regional geology, land use studies, water resources, vegetation studies, coastal studies and soils - especially during cloud season.	SAR-L	Type: Sun-synchronous Altitude: 610 km Period: 96.5 mins Inclination: 97.844 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
SAC-C CONAE	Currently being flown	21 Nov 2000	Jan 2013	Earth observation, studies the structure and dynamics of the Earth's surface, atmosphere, ionosphere and geomagnetic field.	MMRS, HRTC, HSTC, MMP, GOLPE, IST, INES, ICARE, WTE, DCS (SAC-C)	Type: Sun-synchronous Altitude: 705 km Period: 98 mins Inclination: 98.2 deg Repeat cycle: 9 days LST: 10:25 Longitude (if geo): Asc/desc: Descending URL: www.conae.gov.ar/
SAC-D/Aquarius CONAE / NASA	Currently being flown	10 Jun 2011	Jun 2017	Earth observation studies; measurement of ocean salinity; atmospheric and environmental parameters, emergency management.	Lagrange, MWR, HSC, SODAD/CARMEN-1, NIRST, CARMEN-1, DCS (SAC-D), ROSA, TDP, Aquarius L-Band radiometer, Aquarius L-Band Scatterometer	Type: Sun-synchronous Altitude: 657 km Period: 98 mins Inclination: 98 deg Repeat cycle: 7 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.conae.gov.ar/
SAC-E/SABIA_MAR-A CONAE	Approved	Sep 2016	Sep 2021	Global ocean colour medium resolution, urban lights, polar auroras, centralised data collection.	DCS (SABIA_MAR), HSC, MUS-M	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: Descending URL: www.conae.gov.ar/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
SAC-E/SABIA_MAR-B CONAE	Approved	Nov 2017	Nov 2022	Coastal zones ocean colour low resolution.	DCS (SABIA_MAR), HSC, MUS-L	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 4 days LST: Longitude (if geo): Asc/desc: Descending URL: www.conae.gov.ar/
SAGE-III Stratospheric Aerosol and Gas Experiment NASA	Planned	2014	2018	Refurbishment of the SAGE-III instrument and of a hexapod pointing platform, and accommodation studies. This mission flies on the ISS.	SAGE-III	Type: Inclined, non-sun-synchronous Altitude: 425 km Period: Inclination: 51 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: www-sage3.larc.nasa.gov/missions/
SAOCOM 1A CONAE / ASI	Approved	Dec 2014	Dec 2019	Earth observation and emergency management with an L-band SAR.	SAR-L	Type: Sun-synchronous Altitude: 620 km Period: 97.2 mins Inclination: 97.89 deg Repeat cycle: 16 days LST: 6:12 Longitude (if geo): Asc/desc: Ascending URL: www.conae.gov.ar/
SAOCOM 1B CONAE / ASI	Approved	Dec 2015	Dec 2020	Earth observation and emergency management with an L-band SAR.	SAR-L	Type: Sun-synchronous Altitude: 620 km Period: 97.2 mins Inclination: 97.89 deg Repeat cycle: 16 days LST: 6:12 Longitude (if geo): Asc/desc: Ascending URL: www.conae.gov.ar/
SAOCOM-2A CONAE	Planned	2019	2024	Earth observation and emergency management with an L-band SAR.	SAR-L	Type: Sun-synchronous Altitude: 620 km Period: Inclination: 98 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.conae.gov.ar/
SAOCOM-2B CONAE	Planned	2020	2025	Earth observation and emergency management with an L-band SAR.	SAR-L	Type: Sun-synchronous Altitude: 620 km Period: Inclination: 98 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: www.conae.gov.ar/
SARAL Satellite with ARgos and ALtiKa CNES / ISRO	Approved	Dec 2012	Dec 2015	This will provide precise, repetitive global measurements of sea surface height, significant wave heights and wind speed.	ARGOS, AltiKa	Type: Sun-synchronous Altitude: 799 km Period: 100.59 mins Inclination: 98.55 deg Repeat cycle: 35 days LST: 18:00 Longitude (if geo): Asc/desc: Descending URL: smsc.cnes.fr/SARAL/
SARE-1B SARE-1 CONAE	Planned	2014	2017	Segmented architecture development.	SAR components testing	Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
Scatsat-1 Scatterometer Satellite-1 ISRO	Considered	2018	2022	Ocean and atmosphere applications, wind speed over oceans, temperature.	Scatterometer (OCEANSAT), TSU	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
SCD-1 Data Collecting Satellite 1 INPE	Currently being flown	09 Feb 1993	Dec 2012	Data collection and communication.	DCS	Type: Inclined, non-sun-synchronous Altitude: 750 km Period: 100 mins Inclination: 25 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: www.inpe.br
SCD-2 Data Collecting Satellite 2 INPE	Currently being flown	22 Oct 1998	Dec 2012	Data collection and communication.	DCS	Type: Inclined, non-sun-synchronous Altitude: 750 km Period: 100 mins Inclination: 25 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: www.inpe.br
SCISAT-1 SCISAT-I/ACE CSA	Currently being flown	12 Aug 2003	Mar 2015	To improve our understanding of the depletion of the ozone layer, particularly over Canada and the Arctic.	ACE-FTS, MAESTRO	Type: Inclined, non-sun-synchronous Altitude: 650 km Period: 97.7 mins Inclination: 74 deg Repeat cycle: 365 days LST: Longitude (if geo): Asc/desc: N/A URL: www.asc-csa.gc.ca/eng/satellites/scisat/default.asp
SCLP Snow and Cold Land Processes NASA	Considered	2030	2033	Phase-3 DS Mission, launch order unknown, 3-year nominal mission. Snow accumulation for fresh water availability.	Ku and X-band radars (SCLP), K band radiometers (SCLP)	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 15 days LST: Longitude (if geo): Asc/desc: URL: decadal.gsfc.nasa.gov/sclp.html
Sentinel-1 A ESA / EC	Approved	Oct 2013	Jan 2021	Providing continuity of C-band SAR data for operational applications notably in the following areas: monitoring of sea ice zones and the arctic environment, surveillance of marine environment, monitoring of land surface motion risks and mapping in support of humanitarian aid in crisis situations.	C-Band SAR	Type: Sun-synchronous Altitude: 693 km Period: 98.74 mins Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-1 B ESA / EC	Approved	Jan 2015	May 2022	Providing continuity of C-band SAR data for operational applications notably in the following areas: monitoring of sea ice zones and the arctic environment, surveillance of marine environment, monitoring of land surface motion risks and mapping in support of humanitarian aid in crisis situations.	C-Band SAR	Type: Sun-synchronous Altitude: 693 km Period: 98.74 mins Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-1 C ESA / EC	Considered	2019	2026	Providing continuity of C-band SAR data for operational applications notably in the following areas: monitoring of sea ice zones and the arctic environment, surveillance of marine environment, monitoring of land surface motion risks and mapping in support of humanitarian aid in crisis situations.	C-Band SAR	Type: Sun-synchronous Altitude: 693 km Period: 98.74 mins Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
Sentinel-2 A ESA / EC	Approved	Jun 2014	Sep 2021	Supporting land monitoring related services, including: generation of generic land cover maps, risk mapping and fast images for disaster relief, generation of leaf coverage leaf chlorophyll content and leaf water content.	MSI (Sentinel-2)	Type: Sun-synchronous Altitude: 786 km Period: 100.7 mins Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-2 B ESA / EC	Approved	May 2015	Aug 2022	Supporting land monitoring related services, including: generation of generic land cover maps, risk mapping and fast images for disaster relief, generation of leaf coverage leaf chlorophyll content and leaf water content.	MSI (Sentinel-2)	Type: Sun-synchronous Altitude: 786 km Period: 100.7 mins Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-2 C ESA / EC	Considered	2020	2027	Supporting land monitoring related services, including: generation of generic land cover maps, risk mapping and fast images for disaster relief, generation of leaf coverage, leaf chlorophyll content and leaf water content.	MSI (Sentinel-2)	Type: Sun-synchronous Altitude: 786 km Period: 100.7 mins Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-3 A ESA / EUMETSAT / EC	Approved	Apr 2014	Aug 2021	Supporting global land and ocean monitoring services, in particular: sea/land colour data and surface temperature; sea surface and land ice topography; coastal zones, inland water and sea ice topography; vegetation products.	OLCI, SLSTR, SRAL	Type: Sun-synchronous Altitude: 814 km Period: 100 mins Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-3 B ESA / EUMETSAT / EC	Approved	Oct 2014	Feb 2022	Supporting global land and ocean monitoring services, in particular: sea/land colour data and surface temperature; sea surface and land ice topography; coastal zones, inland water and sea ice topography; vegetation products.	OLCI, SLSTR, SRAL	Type: Sun-synchronous Altitude: 814 km Period: 100 mins Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-3 C ESA / EUMETSAT / EC	Considered	2020	2027	Supporting global land and ocean monitoring services, in particular: sea/land colour data and surface temperature; sea surface and land ice topography; coastal zones, inland water and sea ice topography; vegetation products.	OLCI, SLSTR, SRAL	Type: Sun-synchronous Altitude: 814 km Period: 100 mins Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html
Sentinel-4 A ESA / EC	Planned	2018	2027	Supporting European atmospheric composition and air quality monitoring services. The Sentinel-4 A mission is carried on MTG S1.	UVN (Sentinel-4), IRS	Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.esa.int/esaLP/LPgmes.html
Sentinel-4 B ESA / EC	Planned	2024	2033	Supporting European atmospheric composition and air quality monitoring services. The Sentinel-4 B mission is carried on MTG S2.	UVN (Sentinel-4), IRS	Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 Asc/desc: N/A URL: www.esa.int/esaLP/LPgmes.html
Sentinel-5 ESA	Planned	2019	2026	In early stages of mission definition. Other payloads will be added. The Sentinel-5 mission is carried on EPS-SG-a.	IRS, METimage, UVNS (Sentinel-5)	Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.esa.int/esaLP/LPgmes.html
Sentinel-5 precursor ESA / NSO	Approved	Jun 2015	Jun 2020	Supporting global atmospheric composition and air quality monitoring services. It will bridge the gap between Envisat and Sentinel-5.	UVNS (Sentinel-5 precursor)	Type: Sun-synchronous Altitude: 824 km Period: 17 mins Inclination: 98.742 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: www.esa.int/esaLP/LPgmes.html
Sich-2 NSAU	Currently being flown	17 Aug 2011	Aug 2015	Land observation.	MSS (Sich), MIRS	Type: Sun-synchronous Altitude: 668 km Period: 98 mins Inclination: 98 deg Repeat cycle: 5 days LST: 10:50 Longitude (if geo): Asc/desc: Descending URL:
SMAP Soil Moisture Active Passive NASA / CSA	Approved	Oct 2014	Mar 2018	Late 2014 launch expected, 3-year nominal mission life. Global soil moisture and freeze-thaw state mapping.	L-band Radar (SMAP), L-band Radiometer (SMAP)	Type: Sun-synchronous Altitude: 685 km Period: 98.46 mins Inclination: 98.12 deg Repeat cycle: LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: smap.jpl.nasa.gov/
SMOS Soil Moisture and Ocean Salinity (Earth Explorer Opportunity Mission) ESA / CDTI / CNES	Currently being flown	02 Nov 2009	Nov 2012	Overall objectives are to provide global observations of two crucial variables for modelling the weather and climate, soil moisture and ocean salinity. It will also monitor the vegetation water content, snow cover and ice structure.	MIRAS (SMOS)	Type: Sun-synchronous Altitude: 758 km Period: 100.075 mins Inclination: 98.44 deg Repeat cycle: 23 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: earth.esa.int/SMOS/
SORCE Solar Radiation and Climate Experiment NASA	Currently being flown	25 Jan 2003	Sep 2013	5-year nominal mission life, currently in extended operations. Continues the precise, long-term measurements of total solar irradiance at UV and VNIR wavelengths. Daily measurements of solar UV. Precise measurements of visible solar irradiance for climate studies.	SOLSTICE, SIM, TIM, XPS	Type: Inclined, non-sun-synchronous Altitude: 600 km Period: 90 mins Inclination: 40 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: lasp.colorado.edu/sorce/
SPOT-4 Satellite Pour l'Observation de la Terre - 4 CNES	Currently being flown	24 Mar 1998	Jun 2013	Cartography, land surface, agriculture and forestry, civil planning and mapping, digital terrain models, environmental monitoring.	HRVIR, VEGETATION, DORIS (SPOT)	Type: Sun-synchronous Altitude: 832 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.spot.com/home/system/introsat/welcome.htm
SPOT-5 Satellite Pour l'Observation de la Terre - 5 CNES	Currently being flown	04 May 2002	Jun 2014	Cartography, land surface, agriculture and forestry, civil planning and mapping, digital terrain models, environmental monitoring.	HRG, VEGETATION, HRS, DORIS-NG (SPOT)	Type: Sun-synchronous Altitude: 832 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: www.spotimage.fr/home/system/future/spot5/welcome.htm

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
STARLETTE CNES	Currently being flown	06 Feb 1975	Dec 2050	Geodesy/gravity study of the Earth's gravitational field and its temporal variations.	Laser Reflectors	Type: Inclined, non-sun-synchronous Altitude: 812 km Period: 104 mins Inclination: 49.83 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
STELLA CNES	Currently being flown	30 Sep 1993	Dec 2050	Geodesy/gravity study of the Earth's gravitational field and its temporal variations.	Laser Reflectors	Type: Inclined, non-sun-synchronous Altitude: 830 km Period: 101 mins Inclination: 98 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL:
Suomi NPP Suomi National Polar-orbiting Partnership NASA / NOAA	Currently being flown	28 Oct 2011	Mar 2017	5-year nominal mission life. Operational polar weather and climate measurements.	CrIS, CERES, VIIRS, ATMS, OMPS	Type: Sun-synchronous Altitude: 824 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: jointmission.gsfc.nasa.gov/
Swarm Earth's Magnetic Field and Environment Explorers ESA / CNES / CSA	Approved	Nov 2012	Nov 2016	To provide the best ever survey of the geomagnetic field and its temporal evolution, and gain new insights into improving our knowledge of the Earth's interior and climate.	Laser Reflectors (ESA), ASM, VFM, STR, EFI, ACC, GPS Receiver (Swarm)	Type: Inclined, non-sun-synchronous Altitude: 450 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: www.esa.int/export/esaLP/swarm.html
SWOT Surface Water Ocean Topography NASA / CNES / CSA	Considered	2019	2023	Phase-2 DS Mission, launch order unknown, 3.3-year nominal mission. Characterize ocean mesoscale and sub-mesoscale circulation at spatial resolutions = 10 km and inventory all terrestrial water bodies with surface area > 250 m2 and rivers with width > 100 m	LRA, AMR, GPSP, Ka-band Radar INterferometer (KaRIN)	Type: Inclined, non-sun-synchronous Altitude: 970 km Period: Inclination: 78 deg Repeat cycle: 22 days LST: Longitude (if geo): Asc/desc: URL: swot.jpl.nasa.gov
TanDEM-X TerraSAR-X Add-on for Digital Elevation Measurements DLR	Currently being flown	21 Jun 2010	Dec 2015	Cartography, land surface, civil planning and mapping, digital terrain models, environmental monitoring.	X-Band SAR	Type: Sun-synchronous Altitude: 514 km Period: 94.85 mins Inclination: 97.4 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.dlr.de/hr/desktopdefault.aspx/tabid-2317/3669_read-5488/
TCTE TSI Calibration Transfer Experiment NASA	Planned	2013	2014		TIM	Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL:
Terra Terra (formerly EOS AM-1) NASA / METI / CSA	Currently being flown	18 Dec 1999	Sep 2013	6-year nominal mission life, currently in extended operations. Atmospheric dynamics/water and energy cycles, atmospheric chemistry, physical and radiative properties of clouds, air-land exchanges of energy, carbon and water, vertical profiles of CO and methane vulcanology.	MOPITT, MODIS, MISR, CERES, ASTER	Type: Sun-synchronous Altitude: 705 km Period: 99 mins Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: terra.nasa.gov/
TerraSAR-X DLR	Currently being flown	15 Jun 2007	Dec 2013	Cartography, land surface, civil planning and mapping, digital terrain models, environmental monitoring.	X-Band SAR, GPSRO (Terra-SAR)	Type: Sun-synchronous Altitude: 514 km Period: 94.85 mins Inclination: 97.4 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: www.terrasar.de/
THEOS Thailand Earth Observation System GISTDA	Currently being flown	01 Oct 2008	Oct 2013	Earth resources, land surface and disaster monitoring, civil planning.	PAN (GISTDA), MS (GISTDA)	Type: Sun-synchronous Altitude: 822 km Period: 101 mins Inclination: 98.7 deg Repeat cycle: 26 days LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: www.gistda.or.th
TRMM Tropical Rainfall Measuring Mission NASA / JAXA	Currently being flown	27 Nov 1997	Sep 2013	3-year nominal mission life, currently in extended operations. Atmospheric dynamics/water and energy cycles.	LIS, PR, CERES, VIRS, TMI	Type: Inclined, non-sun-synchronous Altitude: 405 km Period: 93.5 mins Inclination: 35 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: trmm.gsfc.nasa.gov/
TSX-NG TerraSAR Next Generation DLR	Planned	2016	2023	Commercial follow-on mission to TerraSAR-X operated by Infoterra. Cartography, land surface, civil planning and mapping, digital terrain models, environmental monitoring.	X-Band SAR	Type: Sun-synchronous Altitude: 514 km Period: 94.85 mins Inclination: 97.4 deg Repeat cycle: LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL:
UK-DMC2 UK Disaster Monitoring Constellation 2 UKSA	Currently being flown	29 Jul 2009	Jul 2014	Wide area, medium resolution optical imaging for mapping, crop monitoring, environmental resource and disaster management.	SLIM-6-22	Type: Sun-synchronous Altitude: 660 km Period: 98.5 mins Inclination: 98.14 deg Repeat cycle: 5 days LST: 10:45 Longitude (if geo): Asc/desc: Ascending URL: www.dmcii.com
VENUS Vegetation and Environment monitoring on a New Micro-Satellite CNES / ISA	Approved	Jun 2013	Jun 2016	Vegetation, agriculture monitoring, water management.	VSC	Type: Sun-synchronous Altitude: 720 km Period: Inclination: 98.27 deg Repeat cycle: 2 days LST: Longitude (if geo): Asc/desc: Descending URL: smsc.cnes.fr/VENUS/index.htm
YOUTHSAT ISRO	Currently being flown	20 Apr 2011	Apr 2013	Airglow of Earth's atmosphere (ionosphere), mapping total electron content in ionosphere.	LIV HYSI, RaBIT	Type: Sun-synchronous Altitude: 817 km Period: 101.35 mins Inclination: 98.731 deg Repeat cycle: 24 days LST: Longitude (if geo): Asc/desc: Descending URL: www.isro.org/
ZY-02C Earth Resources Satellite CRESDA	Currently being flown	22 Nov 2011	Dec 2015	Earth resources, environmental monitoring, land surface.	CCD (ZY-02C and ZY-3), PAN (ZY-02C)	Type: Sun-synchronous Altitude: 778 km Period: 100.3 mins Inclination: 98.5 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/

Mission	Status	Launch Date	EOL Date	Applications	Instruments	Orbit Details & URL
ZY-3 Mapping satellites CRESDA	Currently being flown	09 Jan 2012	Jun 2017	Earth resources, land surface,stereo mapping	CCD (ZY-02C and ZY-3), MUX (ZY-3)	Type: Sun-synchronous Altitude: Period: 100.3 mins Inclination: Repeat cycle: 59 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/

A-Z table of satellite instruments

CEOS agencies are operating or planning 812 instruments (399 distinct instruments, some being repeats) on their Earth observation missions in the 2012 - 2027 period. The table below presents their main characteristics. Please refer to the instruments table in the on-line database for the ability to export or analyse this data in more detail:

http://database.eohandbook.com/database/instrumenttable.aspx

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
3MI EUMETSAT	EPS-SG-a	Approved		Instrument TBC.	Waveband: Spatial resolution: Swath width: Accuracy:
A-DCS4 ARGOS-Data Collection System NOAA	Free Flyer-1, Free Flyer-2, GOES-13, GOES-14, GOES-15, JPSS-2, Metop-C, NOAA-19	Operational	Data collection	Data collection and communication system for receiving and retransmitting data from ocean and land-based remote observing platforms/transponders.	Waveband: UHF Spatial resolution: Swath width: Accuracy:
ABI Advanced Baseline Imager NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Imaging multi-spectral radiometers (vis/IR)	Detects clouds, cloud properties, water vapour, land and sea surface temperatures, dust, aerosols, volcanic ash, fires, total ozone, snow and ice cover, vegetation index.	Waveband: 16 bands in VIS, NIR and IR ranging from 0.47 µm to 13.3 µm Spatial resolution: 0.5 km in 0.64 µm band; 2.0 km in long wave IR and in the 1.378 µm band; 1.0 km in all others Swath width: Accuracy: Varies by product
ACC Accelerometer ESA	Swarm	Being developed	Precision orbit and space environment	Measurement of the spacecraft non-gravitational accelerations, linear accelerations range: +/- 2*10-4 m/s2; angular measurement range: +/- 9.6* 10-3 rad/s2; measurement bandwidth: 10-4 to 10-2 Hz; Linear resolution: 1.8*10-10 m/s2; angular resolution: 8*10-9 rad/s2.	Waveband: N/A Spatial resolution: 0.1 nm/s2 Swath width: N/A Accuracy: overall instrument random error: <10 - 8 m/s2
ACE-FTS Atmospheric Chemistry Experiment (ACE) Fourier Transform Spectrometer CSA	SCISAT-1	Operational	Atmospheric chemistry	Measure and understand the chemical processes that control the distribution of ozone in the Earth's atmosphere, especially at high altitudes.	Waveband: SWIR - TIR: 2 - 5.5 µm, 5.5 - 13 µm (0.02 cm-1 resolution) Spatial resolution: Swath width: Accuracy: Depends on species, meets requirements for climate variables
ACRIM III Active Cavity Radiometer Irradiance Monitor NASA	ACRIMSAT	Operational	Earth radiation budget radiometers	Measurements of solar luminosity and solar constant. Data used as record of time variation of total solar irradiance, from extreme UV through to infrared.	Waveband: UV - MWIR: 0.15 - 5 µm Spatial resolution: 5 deg FOV Swath width: 71 mins per orbit of full solar disk data Accuracy: 0.1% of full scale
Advanced DCS Advanced Data Collection System ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced GGAK-M Advanced Module for Geophysical Measurements (SEM) ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Space environment and magnetic field	Space Environmental Monitoring (SEM).	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced GOCI Advanced Geostationary Ocean Colour Imager KARI	GEO-KOMPSAT-2B	Proposed	Ocean colour instruments	Ocean colour information, coastal zone monitoring, land resources monitoring.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 360 m Swath width: 1440 km Accuracy:
Advanced IKFS-2 Advanced Fourier spectrometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric temperature and humidity sounders	Atmospheric temperature/humidity profiles, data on cloud parameters, water vapour & ozone column amounts, surface temperature.	Waveband: 3,7 - 15,5 µm, more then 8000 spectral channels Spatial resolution: 35 -100 km Swath width: 1000/2000 km Accuracy: 0.5 K
Advanced KMSS Advanced Multispectral Imager (VIS) ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (vis/IR)	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.4 - 0.9 µm, 6 channels Spatial resolution: 60 m - 100 m Swath width: 900 km Accuracy:
Advanced MI Advanced Meteorological Imager KARI	GEO-KOMPSAT-2A	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring capability for the near real-time generation of high-resolution meteorological products and long-term change analysis of sea surface temperature and cloud coverage.	Waveband: 1: VIS, 0.55 - 0.80 µm; 2: SWIR: 3.50 - 4.00 µm; 3: WV (Waver Vapour): 6.50 - 7.00 µm; 4: TIR1 (Thermal Infrared 1): 10.3 - 11.3 µm, 5: TIR2 (Thermal Infrared 2): 11.5 - 12.5 µm Spatial resolution: VIS: 0.5km, 1 km, IR: 2 km Swath width: Full Earth disk Accuracy:
Advanced MSU-MR Advanced Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.7 µm; NIR: 0.7 - 1.1 µm; SWIR: 1.6 - 1.8 µm; MWIR: 3.5 - 4.1 µm; TIR: 10.5 - 11.5 µm, 11.5 - 12.5 µm Spatial resolution: 1 km Swath width: 3000 km Accuracy: VIS: 0.5%; IR: 0.1 - 0.2 K
Advanced MTVZA Advanced Scanning microwave imager-sounder ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging multi-spectral radiometers (passive microwave)	Atmospheric temperature and humidity profiles, precipitation, sea-level wind speed, snow/ice coverage.	Waveband: 10.6 - 183.3 GHz, 26 channels Spatial resolution: 12 - 75 km Swath width: 2600 km Accuracy: 0.4 - 2.0 K depending on spectral band
Advanced Radiomet Advanced Radio-occultation receiver ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric temperature and humidity sounders	Atmospheric temperature and humidity profiles with high vertical resolution.	Waveband: Spatial resolution: Swath width: Accuracy:
Advanced SAR Advanced Synthetic Aperture Radar X band ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Imaging microwave radars	High resolution microwave radar images for ice watch.	Waveband: X-Band Spatial resolution: 1 m, 5 m, 50 m, 200 m, 500 m Swath width: 10 km, 50 km, 130 km, 600 km, 750 km Accuracy: 1 dB
Advanced Scatterometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Scatterometers	Ocean surface wind measurements.	Waveband: C (or X) - band, TBD Spatial resolution: 25 km Swath width: 1800 km Accuracy: Wind speed: 2 m/s, direction: 20 grad
AEISS Advanced Electronic Image Scanning System KARI (DLR)	KOMPSAT-3	Operational	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 0.8 m; VNIR: 4 m Swath width: 15 km Accuracy:
AEISS-A Advanced Electronic Image Scanning System-A KARI (DLR)	KOMPSAT-3A	Being developed	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 0.8 m, VNIR: 4 m, IR: 5.5m Swath width: 15 km Accuracy:
AHI Advanced Himawari Imager JMA	Himawari-8, Himawari-9	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, cloud properties, water vapour, rainfalll, sea surface temperatures and Earth radiation, dust, aerosols, volcanic ash, fires, snow and ice cover.	Waveband: 16 bands in VIS, NIR and IR ranging from 0.46 µm to 13.3 µm VIS (~0.40 µm - ~0.75 µm) NIR (~0.75 µm - ~1.3 µm) SWIR (~1.3 µm - ~3.0 µm) MWIR (~3.0 µm - ~6.0 µm) TIR (~6.0 µm - ~15.0 µm) Spatial resolution: 0.5 km in 0.64 µm band; 1.0km in 0.46 µm, 0.51 µm and 0.86 µm band, 2.0 km in all others Swath width: Full Earth disk and several reserved sectors every 10 minutes Accuracy:
AIRS Atmospheric Infra-red Sounder NASA	Aqua	Operational	Atmospheric temperature and humidity sounders	High spectral resolution measurement of temperature and humidity profiles in the atmosphere. Long-wave Earth surface emissivity. Cloud diagnostics. Trace gas profiles. Surface temperatures.	Waveband: VIS - TIR: 0.4 - 1.7 µm, 3.4 - 15.4 µm, Has approximately 2382 bands from VIS to TIR Spatial resolution: 1.1 degree (13 x 13 km at nadir) Swath width: +/-48.95 degrees Accuracy: Humidity: 20%, Temperature: 1 K
AIS (RCM) Automated Identification System (RADARSAT Constellation) CSA	RADARSAT C-1, RADARSAT C-2, RADARSAT C-3	Being developed	Data collection	Ship identification (name, location, heading, cargo, etc).	Waveband: VHF (162 MHz) Spatial resolution: N/A Swath width: 800 km minimum Accuracy: Better than 90% ship detection, for Class A ships, when ships are in view for a minimum of 5 minutes.

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
ALADIN Atmospheric Laser Doppler Instrument ESA	ADM-Aeolus	Being developed	Lidars	Global wind profiles (single line-of-sight) for an improved weather prediction.	Waveband: UV: 355 nm Spatial resolution: One wind profile every 200 km along track, averaged over 50 km Swath width: Along line 285 km parallel to satellite ground track Accuracy: Wind speed error below 2 m/s
ALI Advanced Land Imager NASA	NMP EO-1	Operational	High resolution optical imagers	Measurement of Earth surface reflectance. Will validate new technologies contributing to cost reduction and increased capabilities for future missions. ALI comprises a wide field telescope and multispectral and panchromatic instrument.	Waveband: 10 bands: VIS and NIR: 0.480 - 0.690 µm, 0.433 - 0.453 µm, 0.450 - 0.515 µm, 0.525 - 0.605 µm, 0.630 - 0.690 µm, 0.775 - 0.805 µm, 0.845 - 0.890 µm, 1.200 - 1.300 µm, SWIR: 1.550 - 1.750 µm, 2.080 - 2.350 µm Spatial resolution: PAN: 10 m, VNIR and SWIR: 30 m Swath width: 185 km Accuracy: SNR @ 5% surf refl Pan:220, Multi 1: 215, Multi 2: 280, Multi 3: 290, Multi 4:240, Multi 4':190, Multi 5':130, Multi 5:175, Multi 7:170 (prototype instrument exceeds ETM+ SNR by a factor of 4 - 8)
ALISEO SAGNAC imaging spectrometer ASI	MIOSAT	Approved	Imaging multi-spectral radiometers (vis/IR)	Mutli-spectrometer data for complex land ecosystem studies.	Waveband: 400 - 1000 nm Spatial resolution: 10 m Swath width: 10 km Accuracy: average spectral resolution: 5 nm
ALT Radar Altimeter NSOAS (CAST)	HY-2A, HY-2B, HY-2C, HY-2D	Operational	Radar altimeters	Global ocean topography, sea level and gravity field measurements.	Waveband: 13.58 GHz and 5.25 GHz Spatial resolution: 16 km Swath width: 16 km Accuracy: < 4 cm
AltiKa Ka-band Altimeter CNES	SARAL	Being developed	Radar altimeters	Sea surface height.	Waveband: 35.5 - 36 GHz, passive channels (radiometer): 24 (K-band) and 37 (Ka-band) GHz; active radar altimeter: 35 GHz (Ka-band) Spatial resolution: Swath width: Accuracy:
AMR Advanced Microwave Radiometer NASA	Jason-3, OSTM (Jason-2), SWOT	Operational	Imaging multi-spectral radiometers (passive microwave)	Altimeter data to correct for errors caused by water vapour and cloud-cover. Also measures total water vapour and brightness temperature.	Waveband: Microwave: 18.7 GHz, 23.8 GHz, 34 GHz Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz Swath width: 120 deg cone centred on nadir Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K
AMSR-2 Advanced Microwave Scanning Radiometer -2 JAXA	GCOM-W1, GCOM-W2, GCOM-W3	Operational	Imaging multi-spectral radiometers (passive microwave)	Measurements of water vapour, cloud liquid water, precipitation, winds, sea surface temperature, sea ice concentration, snow cover, soil moisture.	Waveband: Microwave: 6.925 GHz, 7.3 GHz, 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89.0 GHz Spatial resolution: 5 - 50 km (dependent on frequency) Swath width: 1450 km Accuracy: Sea surface temperature: 0.5 K, Sea ice cover: 10%, Cloud liquid water: 0.05 kg/m2, Precipitation rate: 10%, Water vapour: 3.5 kg/m2 through total column, Sea surface wind speed 1.5 m/s
AMSU-A Advanced Microwave Sounding Unit-A NASA	Aqua	Operational	Atmospheric temperature and humidity sounders	All-weather night-day temperature sounding to an altitude of 45 km.	Waveband: Microwave: 15 channels, 23.8 - 89.0 GHz Spatial resolution: 48 km Swath width: 2054 km Accuracy: Temperature profile: 2 K, humidity: 3 kg/m2, ice & snow cover: 10%
AMSU-A Advanced Microwave Sounding Unit-A NOAA (UKSA)	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-16, NOAA-17, NOAA-18	Operational	Atmospheric temperature and humidity sounders	All-weather night-day temperature sounding to an altitude of 45 km.	Waveband: Microwave: 15 channels, 23.8 - 89.0 GHz Spatial resolution: 48 km Swath width: 2054 km Accuracy: Temperature profile: 2 K, humidity: 3 kg/m2, ice & snow cover: 10%
AMSU-B Advanced Microwave Sounding Unit-B NOAA (UKSA)	NOAA-15, NOAA-16, NOAA-17	Operational	Atmospheric temperature and humidity sounders	All-weather night-day humidity sounding.	Waveband: Microwave: 89 GHz, 150 GHz, 183.3± 1.0 GHz (2 bands), 183.3± 3.0 GHz (2 bands), 183.3± 7.0 GHz (2 bands) Spatial resolution: 16 km Swath width: 2200 km Accuracy: Humidity profile: 1 kg/m2,
Aquarius L-Band radiometer NASA (CONAE)	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (passive microwave)	L-band passive microwave radiometer measures brightness temperature of ocean to retrieve salinity.	Waveband: L-band (1.4 GHz) Spatial resolution: 100 km Swath width: 300 km Accuracy: 0.2 psu
Aquarius L-Band Scatterometer NASA (CONAE)	SAC-D/Aquarius	Operational	Scatterometers	L-band scatterometer to provide roughness correction to brightness temperature.	Waveband: L-Band (1.2 GHz) Spatial resolution: 100 km Swath width: 300 km Accuracy: 0.2 psu
ARGOS CNES (NASA)	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-16, NOAA-17, NOAA-18, NOAA-19, SARAL	Operational	Data collection	Location data by Doppler measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
Arina ROSKOSMOS	Resurs DK 1, Resurs P N1, Resurs P N2	Operational	Space environment	Insights into electromagnetic field variations as the precursors of earthquakes.	Waveband: Spatial resolution: Swath width: Accuracy:
Arkon-2M SAR ROSKOSMOS	Arkon-2M	Proposed	Imaging microwave radars	X, L, and R-band SAR instrument.	Waveband: X-band – 3 cm, L-band – 23 cm, R-band – 69 cm Spatial resolution: X-band 1 - 1.5m, L-band 3 - 5 m, R-band 30 m Swath width: X-band 2 - 10 km, L-band 20 - 100 km, R-band 100 - 450 km Accuracy: Radiometric resolution 1.2 - 3.5 dB
ASCAT Advanced Scatterometer EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Scatterometers	Sea ice cover, sea ice type and wind speed over sea surface measurements. Air pressure over ocean, polar ice contours, ice/snow imagery, soil moisture.	Waveband: Microwave: C Band, 5.256 GHz Spatial resolution: Hi-res mode: 25 - 37 km, Nominal mode: 50 km Swath width: Continuous; 2 x 500 km swath width Accuracy: Wind speeds in range 4 - 24 m/s: 2 m/s and direction accuracy of 20 deg
ASI Atmospheric Sounding Interferometer CAST (NSMC-CMA)	FY-3D, FY-3E, FY-3F, FY-3G	Prototype	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: Spatial resolution: Swath width: Accuracy:
ASM Absolute Scalar Magnetometer CNES	Swarm	Being developed	Magnetic field	Absolute calibration of Vector Field Magnetometer on board Swarm satellites.	Waveband: N/A Spatial resolution: 0.1 nT Swath width: N/A Accuracy: 0.1 nT
ASTER Advanced Spaceborne Thermal Emission and Reflection Radiometer METI (NASA)	Terra	Operational	High resolution optical imagers	Surface and cloud imaging with high spatial resolution, stereoscopic observation of local topography, cloud heights, volcanic plumes, and generation of local surface digital elevation maps. Surface temperature and emissivity.	Waveband: VIS and NIR: 3 bands in 0.52 - 0.86 µm, SWIR: 6 bands in 1.6 - 2.43 µm, TIR: 5 bands in 8.125 - 11.65 µm Spatial resolution: VNIR: 15 m, stereo: 15 m horizontally and 25 m vertical, SWIR: 30 m, TIR: 90 m Swath width: 60 km Accuracy: VNIR and SWIR: 4% (absolute), TIR: 4 K, Geolocation: 7 m
ATCOR Atmospheric correction ISRO	RESOURCESAT-3, RESOURCESAT-3A	Proposed	High resolution optical imagers	Atmospheric correction.	Waveband: VNIR Hyperspectral Spatial resolution: 40 m Swath width: 734 km Accuracy:
ATLAS Advanced Topographic Laser Altimeter System NASA	ICESat-II	Being developed	Lidars	Provide date on ice sheet height and sea ice thickness, land altitude, aerosol height distributions, cloud height and boundary layer height.	Waveband: VIS-NIR: Laser emits at 1064 nm (for altimetry) and 532 nm (for atmospheric measurements) Spatial resolution: 66 m spots separated by 170 m Swath width: Accuracy: Aerosol profile: 20%, Ice elevation: 20 cm, Cloud top height: 75 m, Land elevation: 20 cm, geoid: 5 m
ATLID ATmospheric LIDar ESA	EarthCARE	Approved	Lidars	Derivation of cloud and aerosol properties - Measurement of molecular and particle backscatter in Rayleigh, co-polar and cross-polar Mie channels.	Waveband: Laser at 355 nm Spatial resolution: 300 m horizontal (TBC) Swath width: Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
ATMS Advanced Technology Microwave Sounder NASA (NOAA)	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric temperature and humidity sounders	Collects microwave radiance data that when combined with the CrIS data will permit calculation of atmospheric temperature and water vapour profiles.	Waveband: Microwave: 22 bands, 23-184 GHz Spatial resolution: 5.2 - 1.1 deg Swath width: 2300 km Accuracy: 0.75 K - 3.60 K
ATOVS (HIRS/3 + AMSU + AVHRR/3) Advanced TIROS Operational Vertical Sounder NOAA	NOAA-15, NOAA-16	Operational	Atmospheric temperature and humidity sounders	Advanced TIROS Operational Vertical Sounder instrument suite.	Waveband: Spatial resolution: Swath width: Accuracy:
AVHRR/3 Advanced Very High Resolution Radiometer/3 NOAA	Metop-A, Metop-B, Metop-C, NOAA-15, NOAA-16, NOAA-17, NOAA-18, NOAA-19	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of land and sea surface temperature, cloud cover, snow and ice cover, soil moisture and vegetation indices. Data also used for volcanic eruption monitoring.	Waveband: VIS: 0.58 - 0.68 µm, NIR: 0.725 - 1.1 µm, SWIR: 1.58 - 1.64 µm, MWIR: 3.55 - 3.93 µm, TIR: 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: 1.1 km Swath width: 3000 km approx, Ensures full global coverage twice daily Accuracy:
AWFI Advanced Wide Field Imager INPE	AMAZONIA-1	Approved	Imaging multi-spectral radiometers (vis/IR)	Used for fire extent detection measurement, coastal and vegetation monitoring, land cover and land use mapping.	Waveband: VIS: 0.45 - 0.50 µm, 0.52 - 0.57 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: VIS - NIR: 40 m Swath width: 740 km Accuracy:
AWiFS Advanced Wide Field Sensor ISRO	RESOURCESAT-1, RESOURCESAT-2, RESOURCESAT-2A	Operational	Imaging multi-spectral radiometers (vis/IR)	Vegetation and crop monitoring, resource assessment (regional scale), forest mapping, land cover/ land use mapping, and change detection.	Waveband: VIS: 0.52 - 0.59 µm and 0.62 - 0.68 µm, NIR: 0.77 - 0.86 µm, SWIR: 1.55 - 1.7 µm Spatial resolution: 55 m Swath width: 740 km Accuracy: 10 bit data
BBR (EarthCARE) BroadBand Radiometer (EarthCARE) ESA	EarthCARE	Approved	Earth radiation budget radiometers	Top of the atmosphere radiances and radiative flux.	Waveband: Shortwave channel: 0.2 - 4 µm, Total channel 0.2 - 50 µm Spatial resolution: 10 x 10 km ground pixel size for each of the three views Swath width: Accuracy: flux retrieval accuracy 10 Wm-2
C-Band SAR C-Band Synthetic Aperture Radar ESA	Sentinel-1 A, Sentinel-1 B, Sentinel-1 C	Being developed	Imaging microwave radars	Marine core services, land monitoring and emergency services. Monitoring sea ice zones and arctic environment. Surveillance of marine environment, monitoring land surface motion risks, mapping of land surfaces (forest, water and soil, agriculture), mapping in support of humanitarian aid in crisis situations.	Waveband: C-band: 5.405 GHz; HH, VV, HH+HV, VV+VH; Incidence angle: 20-45 Spatial resolution: Strip mode: 9 m, Interferometric wide swath mode: 20 m, extra-wide swath mode: 50 m, wave mode: 50 m Swath width: Strip mode: 80 km; Interferometric wide swath mode: 250 km, extra-wide swath mode: 400 km, Wave mode: sampled images of 20 x 20 km at 100 km intervals Accuracy: NESZ: -22 dB; PTAR: -25 dB; DTAR: -22 dB; Radiometric accuracy 1 dB (3 sigma); Radiometric stability: 0.5 dB (3 sigma)
CALIOP Cloud-Aerosol Lidar with Orthogonal Polarization NASA	CALIPSO	Operational	Lidars	Two-wavelength, polarisation lidar capable of providing aerosol and cloud profiles and properties.	Waveband: 532 nm (polarization-sensitive), 1064 nm, VIS - NIR Spatial resolution: Vertical sampling: 30 m, 0 – 40 km Swath width: 333 m along-track Accuracy: 5% (532 nm)
CARMEN-1 CNES (CONAE)	SAC-D/Aquarius	Operational	Space environment	Studying space environment effects.	Waveband: Spatial resolution: Swath width: Accuracy:
CCD (HJ) CCD camera CAST	HJ-1A, HJ-1B	Operational	High resolution optical imagers	Multispectral measurements of Earth's surface for natural enviroment and disaster applications.	Waveband: 0.43 - 0.90 µm (4 bands) Spatial resolution: 30 m Swath width: 360 km (per set), 720 km (two sets) Accuracy:
CCD (ZY-02C and ZY-3) CCD and multispectral imager CRESDA	ZY-02C, ZY-3	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.5-0.8 µm Spatial resolution: 2.36m (ZY-02C HR) 2.1m(ZY-3) Swath width: 52km(ZY-3) 54km(ZY-02C) Accuracy:
CCD camera Charged Coupled Device Camera ISRO	INSAT-3A	Operational	Imaging multi-spectral radiometers (vis/IR)	Cloud and vegetation monitoring.	Waveband: VIS: 0.62 - 0.68 µm; NIR: 0.77 - 0.86 µm; SWIR: 1.55 - 1.69 µm Spatial resolution: 1 x 1 km Swath width: Normal: 6000 (N-S) X 6000 km (E-W) anywhere on earth disc, Program: 6000 (N-S) X (n X 300) km (E-W): n and number of frames programmable Accuracy:
CERES Cloud and the Earth's Radiant Energy System NASA	Aqua, JPSS-1, Suomi NPP, Terra, TRMM	Operational	Earth radiation budget radiometers	Long term measurement of the Earth's radiation budget and atmospheric radiation from the top of the atmosphere to the surface; provision of an accurate and self-consistent cloud and radiation database.	Waveband: 3 channels: 0.3-5 µm, 0.3 - 100 µm, 8 - 12 µm Spatial resolution: 20 km Swath width: Accuracy: 0.5%, 1%, 0.3% (respectively for the 3 channels)
CHRIS Compact High Resolution Imaging Spectrometer ESA (UKSA)	PROBA	Operational	Imaging multi-spectral radiometers (vis/IR)	Supports a range of land, ocean and atmospheric applications, including agricultural science, forestry, environmental science, atmospheric science and oceanography.	Waveband: VIS - NIR: 400 - 1050 nm (63 spectral bands at a spatial resolution of 36 m; or 18 bands at full spatial resolution (18 m)) Spatial resolution: 36 m or 18 m depending on wavebands selected. Swath width: 14 km Accuracy: S/N 200 @ target albedo of 0.2. 12 bits digitisation.
Cloud radar (ACE) NASA	ACE	Proposed	Cloud profile and rain radars	Radar measurement for cloud droplets and precipitation.	Waveband: Dual frequency: 35 and 94 GHz Spatial resolution: Vertical: 250 m, Cross-track: 1.4 km, Along-track: 2.5 km Swath width: Instantaneous Footprint < 1 km Accuracy: TBD
CO Sensor (ASCENDS) NASA	ASCENDS	Proposed	Atmospheric chemistry	Measure the total column CO concentration.	Waveband: 2.3 µm Spatial resolution: Swath width: 200 m Accuracy:
CO2 and O2 LIDAR (ASCENDS) Combined CO2 and O2 column absorption LIDAR (ASCENDS) NASA	ASCENDS	Proposed	Lidars	Measure the number density of Carbon Dioxide (CO2) in the column. Measure length of the column using a laser altimeter and measure ambient air pressure and temperature.	Waveband: 1.57 µm Spatial resolution: Swath width: 200 m Accuracy: 1 ppm CO2; 2 K for temperature
COSI Corea SAR Instrument KARI	KOMPSAT-5	Being developed	Imaging microwave radars	SAR for land applications of cartography and disaster monitoring.	Waveband: microwave Spatial resolution: High: 1 m Swath width: 100 km Accuracy:
CPR (CloudSat) Cloud Profiling Radar NASA	CloudSat	Operational	Cloud profile and rain radars	Primary goal to provide data needed to evaluate and improve the way clouds are represented in global climate models. Measures vertical profile of clouds.	Waveband: Microwave: 94 GHz Spatial resolution: Vertical: 500 m, Cross-track: 1.4 km, Along-track: 2.5 km Swath width: Instantaneous Footprint < 2 km Accuracy: detects ice clouds optical depth >1, water clouds optical depth >3, ice content to +100%, -50%, liquid content to <50%, in-cloud heating to within 1K day-1 km-1
CPR (EarthCARE) Cloud Profiling Radar (EarthCARE) JAXA (NICT)	EarthCARE	Approved	Cloud profile and rain radars	Measurement of cloud properties, light precipitation, vertical motion.	Waveband: Microwave: 94 GHz Spatial resolution: 500 m horizontal Swath width: Accuracy:
CrIS Cross-track Infrared Sounder NOAA	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric temperature and humidity sounders	Daily measurements of vertical atmospheric distribution of temperature, moisture, and pressure.	Waveband: MWIR - TIR: 3.92 - 4.4 µm, 5.7 - 8.62 µm, 9.1 - 14.7 µm, 1300 spectral channels Spatial resolution: IFOV 14 km diameter, 1 km vertical layer resolution Swath width: 2200 km Accuracy: Temperature profiles: to 0.9 K, Moisture profiles: 20 - 35%, Pressure profiles: 1%

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
CZS Coastal Zone Scanner ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Ocean colour instruments	Coastal zone data, estimation of phytoplankton concentration.	Waveband: 0.4 - 0.79 µm, 4 channels Spatial resolution: 80 m Swath width: 800 km Accuracy:
DCS Data Collecting System Transponder CAST	CBERS-3, CBERS-4	Operational	Data collection	Data collection and communication.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS Data Collecting System Transponder INPE	SCD-1, SCD-2	Operational	Data collection	Data collection and communication.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS Data Collection System ROSHYDROMET (ROSKOSMOS)	Arctica, Elektro-L N1, Elektro-L N2, Elektro-L N3, Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2, Meteor-M N3	Operational	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (GOES-R) Data Collection System (NOAA, GOES-R) NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Approved	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (NOAA) Data Collection System (NOAA) NOAA	GOES-12	Operational	Data collection	Collects data on temperature (air/water), atmospheric pressure, humidity and wind speed/direction, speed and direction of ocean and river currents.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (SABIA_MAR) Data Collection System CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Approved	Data collection	Environmental and meteorological data collection from ground platforms (UHF 401.55 MHz uplink).	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: N/A
DCS (SAC-C) Data Collection System CONAE	SAC-C	Operational	Communications	DCS is able to receive data from 200 meteorological and environmental stations for re-transmission of all the data to Cordoba Ground Station.	Waveband: Spatial resolution: Swath width: Accuracy:
DCS (SAC-D) Data Collection System CONAE	SAC-D/Aquarius	Operational	Data collection	Environmental and meteorological data collection from ground platforms (UHF 401.55 MHz uplink).	Waveband: Spatial resolution: Swath width: Accuracy:
DORIS (SPOT) Doppler Orbitography and Radio-positioning Integrated by Satellite (on SPOT) CNES	SPOT-4	Operational	Precision orbit	Orbit determination.	Waveband: Spatial resolution: Swath width: Accuracy: Orbit error ~2.5 cm
DORIS-NG Doppler Orbitography and Radio-positioning Integrated by Satellite-NG CNES	CryoSat-2, HY-2A, Jason-1, OSTM (Jason-2)	Operational	Precision orbit	Precise orbit determination; Real time onboard orbit determination (navigation).	Waveband: Spatial resolution: Swath width: Accuracy: Orbit error ~1 cm
DORIS-NG (SPOT) Doppler Orbitography and Radio-positioning Integrated by Satellite-NG (on SPOT) CNES	SPOT-5	Operational	Precision orbit	Precise orbit determination; Real time onboard orbit determination (navigation).	Waveband: Spatial resolution: Swath width: Accuracy: Orbit error ~1 cm
DPR Dual-frequency Precipitation Radar JAXA	GPM Core	Being developed	Cloud profile and rain radars	Measures precipitation rate classified by rain and snow, in latitudes up to 65 degrees.	Waveband: Microwave: 13.6 GHz (Ku band) and 35.5 GHz (Ka band) Spatial resolution: Range resolution: 5 km Horizontal Swath width: 245 km (Ku-band), 125 km (Ka band) Accuracy: Rainfall rate 0.2 mm/h
DRT-S&R ISRO	INSAT-3A, KALPANA-1	Operational	Communications	Relay of search and rescue information.	Waveband: Spatial resolution: Swath width: Accuracy:
EFI Electric Field Instrument ESA (CSA)	Swarm	Being developed	Space environment and gravity instruments	Suprathermal ion imager and Langmuir probe to measure ion temp, electron temp, ion density, electron density, spacecraft potential and ion incident angle.	Waveband: N/A Spatial resolution: 0.3 mV/m Swath width: N/A Accuracy: <3 mV/m
EGG 3-Axis Electrostatic Gravity Gradiometer ESA	GOCE	Operational	Gravity instruments and precision orbit	Main objective to measure the 3 components of the gravity-gradient tensor (i.e. gradiometer data).	Waveband: Spatial resolution: Swath width: Accuracy:
EPIC Earth Polychromatic Imaging Camera NASA (NOAA)	DSCOVR	Being developed	Imaging multi-spectral radiometers (vis/IR)	Diurnal measurements of ozone, UV surface radiation, clouds and aerosols.	Waveband: 317 - 905 nm in 10 channels Spatial resolution: 8 km Swath width: Accuracy:
ePOP Enhanced Polar Outflow Probe CSA	CASSIOPE	Approved	Space environment	ePOP comprises a suite of eight scientific instruments, including plasma imagers, radio wave receivers, magnetometers and cameras. These will collect data about the effects of solar storms and, more specifically, their harmful impact on radio communications, satellite navigation and other space and ground-based technologies.	Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy:
ERM Earth Radiation Measurement NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Earth radiation budget radiometers	Measures Earth radiation gains and losses on regional, zonal and global scales.	Waveband: 0.2 - 3.8 µm, 0.2 - 50 µm Spatial resolution: 25 km Swath width: 2200 km Accuracy: DLR/DSR10 watts/m2 net solar 3 w/m2 OLR 5 w/m2
ERM-2 Improved Earth Radiation Measurement NRSCC (NSMC-CMA, CAST)	FY-3E, FY-3G	Approved	Earth radiation budget radiometers	Measures Earth radiation gains and losses on regional, zonal and global scales.	Waveband: Spatial resolution: Swath width: Accuracy:
ES Electron Spectrometer NOAA (NASA)	DSCOVR	Being developed	Space environment		Waveband: Spatial resolution: Swath width: Accuracy:
ETM+ Enhanced Thematic Mapper Plus USGS (NASA)	Landsat-7	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, land cover state and change (eg vegetation type). Used as multi-purpose imagery for land applications.	Waveband: VIS - TIR: 8 bands: 0.45 - 12.5 µm Spatial resolution: PAN: 15 m, VIS - SWIR: 30 m, TIR: 60 m Swath width: 185 km Accuracy: 50 - 250 m systematically corrected geodetic accuracy
Event Imaging Spectrometer from GEO (GeoCape) NASA	GEO-CAPE	Proposed	High resolution optical imagers	Predictions of impacts from oil spills, fires, water pollution from sewage and other sources, fertilizer runoff, and other environmental threats. Detection and tracking of waterborne hazardous materials. Monitoring and improvement of coastal health.	Waveband: UV/VIS (310 - 481 nm) and the VIS/NIR (500 - 900 nm) Spatial resolution: 250 m spatial resolution, 20 - 50 nm (MODIS-like) spectral bands Swath width: 300 km swath width coastal regions an targets of opportunity Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
EXIS Extreme Ultraviolet and X-ray Irradiance Sensors NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Other	Monitors the whole-Sun X-ray irradiance in two bands and the whole-Sun EUV irradiance in five bands.	Waveband: Spatial resolution: N/A Swath width: Accuracy:
FCI Flexible Combined Imager EUMETSAT (ESA)	MTG-I1 (imaging), MTG-I2 (imaging), MTG-I3 (imaging), MTG-I4 (imaging)	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, vegetation, radiation fluxes, convection, air mass analysis, cirrus cloud discrimination, tropopause monitoring, stability monitoring, total ozone and sea surface temperature.	Waveband: VIS0.4=0.414 - 0.474 µm, VIS0.5=0.49 - 0.53 µm, VIS0.6=0.615 - 0.665 µm, VIS0.8=0.84 - 0.89 µm, VIS0.9=0.904 - 0.924 µm, NIR1.3=1.365 - 1.395 µm, NIR1.6=1.585 - 1.635 µm, NIR2.2=2.225 - 2.275 µm, IR3.8=3.6 - 4 µm, WV6.3=5.8 - 6.8 µm, WV7.3=7.1 - 7.6 µm, IR8.7=8.5 - 8.9 µm, IR9.7=9.51 - 9.81 µm, IR10.5=10.15 - 10.85 µm, IR12.3=12.05 - 12.55 µm, IR13.3=13 - 13.6 µm (measured at FWHM) Spatial resolution: VIS0.4=1.0 km, VIS0.5=1.0 km, VIS0.6=1.0 km & 0.5 km, VIS0.8=1.0 km, VIS0.9=1.0 km, NIR1.3=1.0 km, NIR1.6=1.0 km, NIR2.2=1.0 km & 0.5 km, IR3.8=2.0 km & 1.0 km, WV6.3=2.0 km, WV7.3=2.0 km, IR8.7=2.0 km, IR9.7=2.0 km, IR10.5=2.0 km & 1.0 km, IR12.3=2.0 km, IR13.3=2.0 km (spatial sampling distance at SSP) Swath width: 210 km swath moved alternately W-E and E-W, moving up S-N a swath width at the end of each swath. Full Disc Coverage (FDC) or Local Area Coverage (LAC) possible. Accuracy: Cloud cover: 10%, Cloud top height: 1 km, Cloud top temperature: 1 K, Cloud type: 8 classes, Surface temperature: 0.7-2.0K, Specific humidity profile: 10%, Wind profile (horizontal component): 2 - 10 m/s, Long wave Earth surface radiation: 5 W/m2
GAMI Greenhouse Gases monitoring Instrument CAST (NSMC-CMA)	FY-3D, FY-3F	TBD	Atmospheric chemistry	Measures greenhouse gases.	Waveband: Spatial resolution: Swath width: Accuracy:
GEMS Geostationary Environmental Monitoring Spectrometer KARI	GEO-KOMPSAT-2B	Proposed	Atmospheric chemistry	Measurements of atmospheric chemistry, precursors of aerosols and ozone in particular, in high temporal and spatial resolution over Asia.	Waveband: TBD Spatial resolution: TBD Swath width: TBD Accuracy:
GeoSTAR MW Array Spectrometer (PATH) NASA	PATH	Proposed	Imaging multi-spectral radiometers (passive microwave)	High frequency, all-weather temperature and humidity soundings for weather forecasting and SST.	Waveband: 50 - 57 GHz, 165 - 183 GHz, and possibly 118 - 125 GHz Spatial resolution: Temporal resolution is 15 to 30 minutes; 25 - 50 km at nadir Swath width: Temporal resolution is 15 to 30 minutes; 25 - 50 km at nadir Accuracy: <.5 K (brightness temperature)
Geoton-L1 ROSKOSMOS (ROSHYDROMET)	Resurs DK 1, Resurs P N1, Resurs P N2	Operational	High resolution optical imagers	Multispectral images of land surfaces.	Waveband: 0.58 - 0.8 µm; 0.5 - 0.6 µm; 0.6 - 0.7 µm; 0.7 - 0.8 µm Spatial resolution: 1-3 m Swath width: 30 km within swath band 400 km Accuracy:
GERB Geostationary Earth Radiation Budget EUMETSAT (ESA)	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Earth radiation budget radiometers	Measures long and short wave radiation emitted and reflected from the Earth's surface, clouds and top of atmosphere. Full Earth disk, all channels in 5 minutes.	Waveband: SW: 0.32 - 4.0 µm, LW 4.0 - 30 µm (by subtraction) Spatial resolution: 44.6 x 39.3 km Swath width: Single column moved alternately W-E and E-W to cover the complete earth disc Accuracy: SW=1.2 Wm-2, LW=7.5 Wm-2
GGAK-E Module for Geophysical Measurements ROSHYDROMET (ROSKOSMOS)	Arctica, Elektro-L N1, Elektro-L N2, Elektro-L N3	Operational	Space environment and magnetic field	Monitoring and forecasting of solar activity, of radiation and magnetic field in the near-Earth space, monitoring of natural and modified magnetosphere, ionosphere and upper atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
GGAK-M Module for Geophysical Measurements (SEM) ROSHYDROMET (ROSKOSMOS)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Space environment and magnetic field	Space Environmental Monitoring (SEM), heliogeophysical.	Waveband: Spatial resolution: Swath width: Accuracy:
GLM GEO Lightning Mapper NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Lightning sensors	Detect total lightning flash rate over near full disk.	Waveband: Spatial resolution: 10 km Swath width: Accuracy: 70%
GMI GPM Microwave Imager NASA	GPM Core	Being developed	Imaging multi-spectral radiometers (passive microwave)	Measures rainfall rates over oceans and land, combined rainfall structure and surface rainfall rates with associated latent heating. Used to produce three hour, daily, and monthly total rainfall maps over oceans and land.	Waveband: Microwave: 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89.0 GHz, 165.5 GHz, 183.31 ± 3 GHz, 183.31 ± 8 GHz Spatial resolution: Horizontal: 36 km cross-track at 10.65 GHz (required - Primary Spacecraft, goal - Constellation Spacecraft); 10 km along-track and cross-track (goal - Primary Spacecraft) Swath width: 800 km (Primary Spacecraft) 1300 km (Constellation Spacecraft) Accuracy: 0.65 - 1.5 K
GNOS GNSS Occultation Sounder CAST (NSMC-CMA)	FY-3D, FY-3E, FY-3F, FY-3G	Approved	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: Spatial resolution: Swath width: Accuracy:
GOCI Geostationary Ocean Colour Imager KARI	COMS	Operational	Ocean colour instruments	Ocean colour information, coastal zone monitoring, land resources monitoring.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 500 m Swath width: 1440 km Accuracy:
GOES Comms Communications package on GOES NOAA	GOES-12, GOES-13, GOES-14, GOES-15	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
GOLPE GPS Occultation and Passive reflection Experiment NASA (CONAE)	SAC-C	Operational	Atmospheric temperature and humidity sounders and precision orbit	Measurements of atmospheric effects on GPS signals, and precise positioning information to assist gravitational measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
GOME-2 Global Ozone Monitoring Experiment - 2 EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric chemistry	Measurement of total column amounts and stratospheric and tropospheric profiles of ozone. Also amounts of H20, NO2, OClO, BrO, SO2 and HCHO.	Waveband: UV - NIR: 0.24 - 0.79 µm (resolution 0.2 - 0.4 nm) Spatial resolution: Horizontal: 40 x 40 km (960 km swath) to 40 x 5 km (for polarization monitoring) Swath width: 120 - 960 km Accuracy: Cloud top height: 1 km (rms), Outgoing short wave radiation and solar irradiance: 5 W/m2, Trace gas profile: 10 - 20%, Specific humidity profile: 10 - 50 g/kg
GOX Global Positioning Satellite Occultation Experiment (GOX) NASA, NSPO (JPL)	COSMIC-1/FORMOSAT-3 FM1, COSMIC-2/FORMOSAT-3 FM2, COSMIC-4/FORMOSAT-3 FM4, COSMIC-5/FORMOSAT-3 FM5, COSMIC-6/FORMOSAT-3 FM6	Operational	Atmospheric temperature and humidity sounders	Each instrument equipped with 4 GPS antennas to receive the L1 and L2 radio wave signals transmitted from the 24 US GPS satellites. Based on the signal transmission delay caused by the electric density, temperature, pressure, and water content in the ionosphere and atmosphere, information about ionosphere and atmosphere can be derived.	Waveband: L1/L2 Spatial resolution: Vertical: 0.3 - 1.5 m; Horizontal: 300 - 600 km Swath width: Accuracy:
GPS (ESA) GPS Receiver ESA	GOCE	Operational	Precision orbit	Satellite positioning.	Waveband: Spatial resolution: Swath width: Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
GPS Receiver (Swarm) GPSR (Swarm) ESA	Swarm	Being developed	Precision orbit		Waveband: Spatial resolution: L1 C/A code range error better than 0.5 m RMS; L1/L2 P-code range error better than 0.25 m RMS; L1 carrier phase error better than 5 mm Swath width: Accuracy:
GPSP Global Positioning System Payload NASA	Jason-3, OSTM (Jason-2), SWOT	Operational	Precision orbit	Precision orbit determination.	Waveband: Spatial resolution: Swath width: Accuracy:
GPSRO (Oersted) GPS Radio Occultation System NASA	Ørsted (Oersted)	Operational	Atmospheric temperature and humidity sounders	Measurements of atmospheric temperature, pressure and water vapour content.	Waveband: Spatial resolution: Swath width: Accuracy:
GPSRO (Terra-SAR) GPS Radio Occultation System NASA	TerraSAR-X	Operational	Atmospheric temperature and humidity sounders	Measurements of atmospheric temperature, pressure and water vapour content.	Waveband: Spatial resolution: Swath width: Accuracy:
GRACE instrument NASA (DLR)	GRACE, GRACE FO, GRACE-II	Operational	Gravity instruments	Includes BlackJack Global Positioning System (Turbo Rogue Space Receiver) and High Accuracy Inter-satellite Ranging System (aka K-band Ranging System) for Inter-satellite ranging system estimates for global models of the mean and time variable Earth gravity field.	Waveband: Microwave: 24 GHz and 32 GHz Spatial resolution: 400 km horizontal, N/A vertical Swath width: N/A Accuracy: 1 cm equivilant water
GRAS GNSS Receiver for Atmospheric Sounding EUMETSAT (ESA)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric temperature and humidity sounders and precision orbit	GNSS receiver for atmospheric temperature and humidity profile sounding.	Waveband: Spatial resolution: Vertical: 150 m (troposphere) and 1.5 km (stratosphere), Horizontal: 100 km approx (troposphere), 300 km approx (stratosphere) Swath width: Altitude range of 5 - 30 km Accuracy: Temperature sounding to 1 K rms
HDWL (3D Winds) NASA	3D Winds	Proposed	Lidars	Tropospheric winds for weather forecasting and pollution transport.	Waveband: 2.051 µm and 0.355 µm Spatial resolution: 300 km along track horizontal resolution Swath width: View 45 degrees of nadir at four azimuth angles: 45, 135, 225, 315 deg. Accuracy: 2-3 m/s LOS wind accuracy projected into horizontal from all effects including sampling error
Himawari Comms Communications package for Himawari JMA	Himawari-8, Himawari-9	Being developed	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
Himawari DCS Data Collection System for Himawari JMA	Himawari-8, Himawari-9	Being developed	Data collection		Waveband: Spatial resolution: Swath width: Accuracy:
HiRI High-Resolution Imager CNES	Pleiades 1A, Pleiades 1B	Operational	High resolution optical imagers	Cartography, land use, risk, agriculture and forestry, civil planning and mapping, digital terrain models, defence.	Waveband: 4 bands + PAN: Near IR (0.77 - 0.91 µm), Red (0.61 - 0.71 µm), Green (0.50 - 0.60 µm), Blue (0.44 - 0.54 µm), Pan (0.47 - 0.84 µm) Spatial resolution: 0.70 m Swath width: 20 km swath at nadir. Agile platform giving ±50 deg off-track Accuracy:
HIRS/3 High Resolution Infra-red Sounder/3 NOAA	NOAA-15, NOAA-16, NOAA-17	Operational	Atmospheric temperature and humidity sounders	Atmospheric temperature profiles and data on cloud parameters, humidity soundings, water vapour, total ozone content, and surface temperatures.	Waveband: VIS - TIR: 0.69 - 14.95 µm (20 channels) Spatial resolution: 20.3 km Swath width: 2240 km Accuracy:
HIRS/4 High Resolution Infra-red Sounder/4 NOAA	Metop-A, Metop-B, NOAA-18, NOAA-19	Operational	Atmospheric temperature and humidity sounders	Atmospheric temperature profiles and data on cloud parameters, humidity soundings, water vapour, total ozone content, and surface temperatures. Same as HIRS/3, with 10 km IFOV.	Waveband: VIS - TIR: 0.69 - 14.95 µm (20 channels) Spatial resolution: 20.3 km Swath width: 2240 km Accuracy:
HISUI Hyperspectral Imager Suite METI	ALOS-3	Being developed	Hyperspectral imagers and high resolution optical imagers	Global energy and resource related applications - Exploration of oil, gas, and metal resources - Environmental assessments of oil/gas fields and mines. Other applications such as environmental monitoring, agriculture, and forestry.	Waveband: Hyperspectral Sensor:VNIR 57 bands (in 0.4 - 0.97 µm), SWIR 128 bands (in 0.9 - 2.5 µm), Multispectral Sensor: 4 bands (in 0.45 - 0.89 µm) Spatial resolution: Hyperspectral Sensor:30 m, Multispectral Sensor: 5 m Swath width: Hyperspectral Sensor:30 km, Multispectral Sensor: 90 km Accuracy: Hyperspectral Sensor:SN = 450 @620 nm, 300 @2100 nm Multispectral Sensor: SN= 200
HRG CNES	SPOT-5	Operational	High resolution optical imagers	High resolution multispectral mapper. 2 HRG instruments on this mission can be processed to produce simulated imagery of 2.5 m. Images are 60 x 60 km in size.	Waveband: VIS: B1: 0.50 - 0.59 µm, B2: 0.61 - 0.68 µm, NIR: B3: 0.79 - 0.89 µm, SWIR: 1.50 - 1.75 µm, Panchromatic: 0.49 - 0.69 µm Spatial resolution: Panchromatic: 5 m, Multispectral: 10 m Swath width: 60 km (1 instrument), 117 km (2 instruments). Same as SPOT 4 with off-track steering capability (±27 deg) Accuracy:
HRMX High Resolution Multi Spectral ISRO	CARTOSAT-2C, CARTOSAT-2D	Proposed	Imaging multi-spectral radiometers (vis/IR)	For crops and vegetation dynamics, natural resources census, disaster management and large scale mapping of themes.	Waveband: 4 bands MX in VIS and NIR Spatial resolution: 2 m / 1m Swath width: 10 km Accuracy:
HRMX-TIR High Resolution TIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: MX (3 Bands TIR) Spatial resolution: 1.5 km Swath width: Accuracy:
HRMX-VNIR High Resolution MX-VNIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: MX (4 Bands VNIR) Spatial resolution: 50 m Swath width: Accuracy:
HRS High Resolution Stereoscope CNES	SPOT-5	Operational	High resolution optical imagers	High resolution stereo instrument.	Waveband: Panchromatic: VIS 0.49 - 0.69 µm Spatial resolution: Panchromatic: 10 m, Altitude: 15 m Swath width: 120 km Accuracy:
HRSS-1 High Resolution SWIR Spectrometer ISRO	Environsat-1, Environsat-2	Proposed		Information on Aerosols & CO2 gas concentration.	Waveband: Spatial resolution: 1.575 - 1.625 µm with 0.2 nm Swath width: 380 km Accuracy:
HRTC High Resolution Panchromatic Camera CONAE	SAC-C	Operational	High resolution optical imagers	High resolution Earth imagery to complement MMRS on the same mission.	Waveband: VIS - NIR: 400 - 900 nm Spatial resolution: 35 m Swath width: 90 km Accuracy:
HRVIR High Resolution Visible and Infra-red CNES (SNSB)	SPOT-4	Operational	High resolution optical imagers	2 HRVIR instruments provide 60 x 60 km images for a range of land and coastal applications.	Waveband: VIS: B1: 0.50 - 0.59 µm, B2: 0.61 - 0.68 µm, NIR: 0.79 - 0.89 µm, SWIR: 1.58 - 1.75 µm, Panchromatic:(B2) 0.61 - 0.68 µm Spatial resolution: 10 m (0.64 µm) or 20 m Swath width: 117 km (i.e. 60 km + 60 km with 3 km overlap). Steerable up to ±27 deg off-track Accuracy:
HRVS-1A/-1B High Resolution VNIR Spectrometer ISRO	Environsat-1, Environsat-2	Proposed		Information on Aerosols & CO2 gas concentration.	Waveband: Spatial resolution: 0.375 - 0.9 µm Swath width: 500 km Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
HSC High Sensitivity Camera CONAE	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (vis/IR)	High Sensitivity Camera (HSC) measures top of atmosphere radiance in the VIS spectral range measured by a high sensitivity sensor detects: urban lights, electric storms, polar regions, snow cover, forest fires, sea surveillance.	Waveband: PAN (VIR-NIR): 450 - 900 nm Spatial resolution: 200 - 300 m Swath width: 1600 km Accuracy:
HSC High Sensitivity Camera CONAE	SAC-E/SABIA_MAR-A, SAC-E/SABIA_MAR-B	Approved	Imaging multi-spectral radiometers (vis/IR)	High Sensitivity Camera (HSC) measures top of atmosphere radiance in the VIS spectral range measured by a high sensitivity sensor detects: urban lights, electric storms, polar regions, snow cover, forest fires, sea surveillance.	Waveband: PAN (VIR-NIR): 450 - 900 nm Spatial resolution: 200 - 300 m Swath width: 1600 km Accuracy:
HSI Hyperspectral Imager DLR	EnMAP	Approved	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Detailed monitoring and characterization of rock and soil targets, vegetation, inland and coastal waters on a global scale.	Waveband: 420 - 2450 nm Spatial resolution: GSD 30 m Swath width: 30 km Accuracy: Radiometric: <5%
HSI (HJ-1A) Hyper Spectrum Imager CAST	HJ-1A	Operational	Imaging multi-spectral radiometers (vis/IR)	Hyperspectral measurements for environment and disaster management operations.	Waveband: 0.45 - 0.95 µm (128 bands) Spatial resolution: 100 m Swath width: 50 km Accuracy:
HSRL (ACE) NASA	ACE	Proposed	Lidars	Measurement of aerosol heights, cloud top heights and aerosol properties.	Waveband: 532 nm (polarization-sensitive), 1064 nm, 355 nm Spatial resolution: Vertical sampling: 30 - 60 m, -2 to 40 km Swath width: 333 m along-track Accuracy:
HSTC High Sensitivity Technological Camera CONAE	SAC-C	Operational	Imaging multi-spectral radiometers (vis/IR)	Monitors forest fires, electrical storms and geophysical studies of aurora borealis.	Waveband: PAN: VIS - NIR: 450 - 850 nm Spatial resolution: 300 m Swath width: 700 km Accuracy:
HYC HYperspectral Camera ASI	PRISMA	Approved	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Hyperspectral data for complex land ecosystem studies.	Waveband: VNIR: 400 - 1010 nm, SWIR: 920 - 2500 nm Spatial resolution: 30 m Swath width: 30 km Accuracy: Spectral resolution 10 nm
Hyperion Hyperspectral Imager NASA	NMP EO-1	Operational	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)	Hyperspectral imaging of land surfaces.	Waveband: VIS - NIR: 400 - 1000 nm; NIR - SWIR: 900 - 2500 nm; 10 nm spectral resolution for 220 bands Spatial resolution: 30 m Swath width: 185 km Accuracy: SNR @ 10% refl target: vis 10-40 swir 10-20
HySI (IMS-1) Hyperspectral Imager (IMS-1) ISRO	IMS-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Ocean and atmosphere study of Earth surface.	Waveband: 64 bands of 8 nm separation between 400 - 950 nm spectral range Spatial resolution: 505.6 m Swath width: 125.5 km Accuracy:
HYSI (IRS-1A)-SWIR Hyperspectral SWIR ISRO	CARTOSAT-1A, CARTOSAT-1B	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: SWIR Hperspectral Spatial resolution: 30 m Swath width: 60 km Accuracy:
HYSI (IRS-1A)-VNIR Hyperspectral VNIR ISRO	CARTOSAT-1A, CARTOSAT-1B	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: VNIR Hyperspectral Spatial resolution: 30 m Swath width: 60 km Accuracy:
HYSI-SWIR Hyperspectral SWIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: 60 Bands VNIR Spatial resolution: 320 m Swath width: Accuracy:
HYSI-VNIR Hyperspectral VNIR ISRO	GISAT	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: 150 Bands SWIR Spatial resolution: 192 m Swath width: Accuracy:
IASI Infrared Atmospheric Sounding Interferometer CNES (EUMETSAT)	Metop-A, Metop-B, Metop-C	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	Measures tropospheric moisture and temperature, column integrated contents of ozone, carbon monoxide, methane, dinitrogen oxide and other minor gases which affect tropospheric chemistry. Also measures sea surface and land temperature.	Waveband: MWIR - TIR: 3.4 - 15.5 µm with gaps at 5 µm and 9 µm Spatial resolution: Vertical: 1 - 30 km, Horizontal: 25 km Swath width: 2052 km Accuracy: Temperature: 0.5 - 2 K, specific humidity: 0.1 - 0.3 g/kg, ozone, trace gas profile: 10%
IASI-NG Infrared Atmospheric Sounding Interferometer - Next Generation EUMETSAT	EPS-SG-a	Proposed	Atmospheric temperature and humidity sounders	Instrument TBC.	Waveband: Spatial resolution: Swath width: Accuracy:
ICARE Influence of Space Radiation on Advanced Components CNES (CONAE)	SAC-C	Operational	Space environment	Improvement of risk estimation models on latest generation of integrated circuits technology.	Waveband: Spatial resolution: Swath width: Accuracy:
ICI Ice Cloud Imager EUMETSAT (ESA)	EPS-SG-b	Approved	Imaging multi-spectral radiometers (passive microwave)		Waveband: 11 channels from 183 to 664 GHz Spatial resolution: Footprint size 15 km (Threshhold) Swath width: Accuracy:
IIR Imaging Infrared Radiometer CNES	CALIPSO	Operational	Imaging multi-spectral radiometers (vis/IR)	Radiometer optimised for combined IIR/lidar retrievals of cirrus particle size.	Waveband: TIR: 8.7 µm, 10.5 µm, and 12.0 µm (0.8 µm resolution) Spatial resolution: 1 km Swath width: 64 km Accuracy: 1 K
IKFS-2 Fourier spectrometer ROSHYDROMET (ROSKOSMOS)	Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Prototype	Atmospheric temperature and humidity sounders	Atmospheric temperature/humidity profiles, data on cloud parameters, water vapour & ozone column amounts, surface temperature.	Waveband: 5 - 15 µm, more then 5000 spectral channels Spatial resolution: 35 -100 km, spectral resolution ~0.5 cm-1 Swath width: 1000/2000 km Accuracy: 0.5 K
Imager NOAA	GOES-12, GOES-13, GOES-14, GOES-15	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, atmospheric radiance, winds, atmospheric stability, rainfall estimates. Used to provide severe storm warnings/ monitoring day and night (type, amount, storm features).	Waveband: GOES 8 - 11: VIS: 1 channel (8 detectors), IR: 4 channels: 3.9 µm, 6.7 µm, 10.7 µm and 12 µm, GOES 12 - Q: VIS: 1 channel (8 detectors), IR: 4 channels: 3.9 µm, 6.7 µm, 10.7 µm and 13.3 µm Spatial resolution: 10 km Swath width: Full Earth disk Accuracy:
Imager (INSAT) Very High Resolution Radiometer ISRO	INSAT-3D, INSAT-3DR, INSAT-3DS	Being developed	Imaging multi-spectral radiometers (vis/IR)	Cloud cover, severe storm warnings/monitoring day and night (type, amount, storm features), atmospheric radiance winds, atmospheric stability rainfall.	Waveband: VIS: 0.55 - 0.75 µm; SWIR: 1.55 - 1.7 µm; MWIR: 3.80 - 4.00 µm, 6.50 - 7.00 µm; TIR: 10.2 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: 1 x 1 km (VIS and SWIR), 4 x 4 km (MWIR, TIR), 8 x 8 km (in 6.50 - 7.00 µm) Swath width: Full Earth disc and space around, Normal Frame (50 deg. N to 40 deg. S and full E-W coverage), Program Frame (Programmable, E-W Full coverage) Accuracy:
IMAGER/MTSAT-2 Imager/MTSAT JMA	MTSAT-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, water vapour, rainfall, sea surface temperature and Earth radiation.	Waveband: VIS - SWIR: 0.55 - 0.80 µm, MWIR - TIR: 3.5 - 4 µm, 6.5 - 7 µm, 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: Visible: 1 km, TIR: 4 km Swath width: Full Earth disk every hour Accuracy:
IMWAS Improved MicroWave Atmospheric Sounder NRSCC (CAST)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Operational	Atmospheric temperature and humidity sounders	Atmospheric sounding measurements.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: Swath width: Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
INES Italian Navigation Experiment ASI (CONAE)	SAC-C	Operational	Precision orbit	Composed of GPS Tensor and GNSS Lagrange Receiver to perform navigation experiment on precise orbit determination.	Waveband: Spatial resolution: Swath width: Accuracy:
IPDA LIDAR Integrated Path Differential Absorption Light Detection and Ranging Instrument DLR (CNES)	MERLIN	Proposed	Atmospheric chemistry	'Active' optical remote sensing instrument for atmospheric parameters or trace gases. Global information on atmospheric Methane concentration (Methane column density measurements).	Waveband: Two laser wavelengths, mean wavelength 1645 µm Spatial resolution: 50 km x 0.1 km Swath width: 0.1 km Accuracy: <2%
IR (HJ-1B) Infrared Camera CAST	HJ-1B	Operational	Imaging multi-spectral radiometers (vis/IR)	Infrared measurements for environment and natural disaster monitoring.	Waveband: 0.75 - 1.10 µm, 1.55 - 1.75 µm, 3.50 - 3.90 µm, 10.5 - 12.5 µm Spatial resolution: 300 m (10.5 - 12.5 µm), 150 m (the other bands) Swath width: 720 km Accuracy:
IR Correlation Radiometer (GeoCape) NASA	GEO-CAPE	Proposed	Imaging multi-spectral radiometers (vis/IR)	The near-IR and thermal-IR data will describe vertical CO, an excellent tracer of long-range transport of pollution. Identifying large scale vegetation burning events. Characterizing the oxidizing capacity of the atmosphere.	Waveband: 2.3, 4.6 µm Spatial resolution: 7 km horizontal spatial resolution, 2-3 layers in vertical resolution; < 0.2 um spectral resolution. Swath width: 2-d image of continental domain (north or south America). Accuracy: CO precision: 1 x 10^17 cm^ (-2)
IR Spectrometer(GACM) NASA	GACM	Proposed	Atmospheric chemistry	Daytime column measurements of CO in SWIR at 2.4 µm.	Waveband: 2.4 and 4.6 µm Spatial resolution: Swath width: Accuracy:
IRAS InfraRed Atmospheric Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Atmospheric temperature and humidity sounders	Atmospheric sounding for weather forecasting.	Waveband: VIS - TIR: 0.65 - 14.95 µm (26 channels) Spatial resolution: 14 km Swath width: 952 km Accuracy: 17 km
IRS Infra-Red Sounder EUMETSAT (ESA)	MTG-S1 (sounding), MTG-S2 (sounding), Sentinel-4 A, Sentinel-4 B, Sentinel-5	Being developed	Atmospheric temperature and humidity sounders	Measurements of vertically resolved clear sky atmospheric motion vectors, temperature and water vapour profiles.	Waveband: LWIR: 700 - 1210 cm^-1, MWIR: 1600 - 2175 cm^-1 Spatial resolution: Horizontal: 4 km at SSP, Vertical: 1 km Swath width: 640 x 640 km dwells, step and stare, moving alternatley E-W and W-E moving up S-N one dwell step at the end of each row of dwells. Each disc is divided in 4 areas of Local Area Coverage (LAC). Accuracy: clear sky AMVs: 2 m/s, temperature profile: 1 K, water vapour profile: 5%
IRS Infrared scanner CAST (INPE)	CBERS-3, CBERS-4	Being developed	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.5 - 0.9 µm; 1.55 - 1.75 µm, 2.08 - 2.35 µm; 10.4 - 12.5 µm Spatial resolution: PAN, SWIR: 40 m, TIR: 80 m Swath width: 120 km Accuracy:
IST Italian Star Tracker ASI (CONAE)	SAC-C	Operational	Precision orbit	Test of a fully autonomous system for attitude and orbit determination using a star tracker.	Waveband: Spatial resolution: Swath width: Accuracy:
IVISSR (FY-2) Improved Multispectral Visible and Infra-red Scan Radiometer (5 channels) NRSCC (NSMC-CMA, CAST)	FY-2D, FY-2E, FY-2F	Operational	Imaging multi-spectral radiometers (vis/IR)	Meteorological.	Waveband: VIS - TIR: 0.5 - 12.5 µm (5 channels) Spatial resolution: 5 km Swath width: Full Earth disk Accuracy: 1.25 - 5 km
JAMI/MTSAT-1R Japanese Advanced Meteorological Imager JMA	MTSAT-1R	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, cloud motion, cloud height, water vapour, rainfall, sea surface temperature and Earth radiation.	Waveband: VIS - SWIR: 0.55 - 0.90 µm, MWIR - TIR: 3.5 - 4 µm, 6.5 - 7 µm, 10.3 - 11.3 µm, 11.5 - 12.5 µm Spatial resolution: Visible: 1 km, TIR: 4 km Swath width: Full Earth disk every hour Accuracy:
JMR JASON Microwave Radiometer NASA	Jason-1, OSTM (Jason-2)	Operational	Imaging multi-spectral radiometers (passive microwave)	Altimeter data to correct for errors caused by water vapour and cloud-cover. Also measures total water vapour and brightness temperature.	Waveband: Microwave: 18.7 GHz, 23.8 GHz, 34 GHz Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz Swath width: 120 deg cone centred on nadir Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K
K band radiometers (SCLP) NASA	SCLP	Proposed	Imaging multi-spectral radiometers (passive microwave)	Snow accumulation for fresh water availability.	Waveband: Spatial resolution: Spatial resolution of 50 to 100 m 15 day temporal resolution Swath width: Accuracy:
Ka-band Radar INterferometer (KaRIN) NASA (CNES)	SWOT	Proposed	Radar altimeters	Swath mapping radar altimeter that provides measurements for surface water.	Waveband: Spatial resolution: Vertical resolution is 2 cm Swath width: Vertical resolution is 2 cm Accuracy:
KMSS Multispectral Imager (VIS) ROSHYDROMET (ROSKOSMOS)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.4 - 0.9 µm, 3 cameras with 3 channels each Spatial resolution: 50 m - 100 m Swath width: 900 km Accuracy:
Ku and X-band radars (SCLP) NASA	SCLP	Proposed	Imaging microwave radars	Snow accumulation for fresh water availability.	Waveband: Spatial resolution: Spatial resolution of 50 to 100 m; 15 day temporal resolution Swath width: Accuracy:
L-band Radar (SMAP) NASA	SMAP	Being developed	Imaging microwave radars	High-resolution measurements of radar backscatter for global estimates of surface soil moisture and freeze/thaw states for climate modeling and weather prediction	Waveband: L-Band (1.2 GHz) Spatial resolution: <3 km spatial resolution over 70% of swath; 3 days temporal resolution. Soil moisture will be estimated at a resolution of 10 km and freeze-thaw state at a resolution of 1-3 km. Swath width: 40-deg constant incidence angle across the 1000 km swath Accuracy: <1dB Co-polarization; <1.5 dB cross-polarization at 3 km resolution
L-band Radiometer (SMAP) NASA	SMAP	Being developed	Imaging multi-spectral radiometers (passive microwave)	High-accuracy measurements of brightness temperatures for global estimates of surface soil moisture for climate modeling and weather prediction	Waveband: L-band (1.4 GHz) Spatial resolution: 40km spatial resolution; 3 days temporal resolution Swath width: 40-deg constant incidence angle across the 1000 km swath Accuracy: 1.3K accuracy brightness temperature
L-band SAR L-band SAR (DESDynI-R) NASA	L-band SAR	Proposed	Imaging microwave radars	3-year mission to study solid earth deformation (earthquakes, volcanoes, landslides), changes in ice (glaciers, sea ice) and changes in vegetation biomass	Waveband: L-Band: 1200 -1300 Hz Spatial resolution: At 12-day repeat, global coverage, 10m resolution Swath width: 240 km Accuracy: TBD
Lagrange LABEN GNSS Receiver for Advanced Navigation, Geodesy and Experiments ASI	SAC-D/Aquarius	Operational	Atmospheric temperature and humidity sounders	GPS Receiver including specialised version equipped with limb sounding antenna and dedicated signal tracking capability for meteorological, climate and space weather applications.	Waveband: Spatial resolution: Swath width: Accuracy:
Laser altimeter (LIST) NASA	LIST	Proposed	Lidars	New technology laser system that performs spatial mapping of Earth's surface from an orbital platform.	Waveband: Spatial resolution: Swath width: Accuracy:
Laser Reflectors CNES	STARLETTE, STELLA	Operational	Precision orbit	Measures distance between the satellite and the laser tracking stations.	Waveband: Spatial resolution: Swath width: Accuracy:
Laser Reflectors (ESA) Laser Reflectors ESA	CryoSat-2, GOCE, Swarm	Operational	Precision orbit	Measures distance between the satellite and the laser tracking stations.	Waveband: Spatial resolution: Swath width: Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
LCCRA Laser Corner Cube Reflector Assembly ASI	LARES	Operational	Precision orbit	Accuracy measurements on Lense-Thirring effect and baseline tracking data for precision geodesy. Also for calibration of radar altimeter bias.	Waveband: VIS: 400 - 750 nm Spatial resolution: N/A Swath width: N/A Accuracy: 2 cm overhead ranging
LEISA AC LEISA Atmospheric Corrector NASA	NMP EO-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Corrects high spatial resolution multispectral imager data for atmospheric effects.	Waveband: 256 bands, NIR - SWIR: 0.89 - 1.58 µm Spatial resolution: 250 m Swath width: 185 km Accuracy:
LI Lightning Imager EUMETSAT (ESA)	MTG-I1 (imaging), MTG-I2 (imaging), MTG-I3 (imaging), MTG-I4 (imaging)	Being developed	Lightning sensors	Real time lightning detection (cloud-to-cloud and cloud-to-ground strokes, with no discrimination between the two), lightning location.	Waveband: NIR neutral oxygen lightning emission features at 777.4 nm Spatial resolution: < 10 km at 45°N Swath width: Fixed view of 80% of visible earth disc, all EUMETSAT member states Accuracy: Detection Efficiency: 90% at 45N, SSP longitude, 70% on average over the area of coverage (for lightning signals 6.7 mWm-2sr-1 during the night, 16.7 mWm-2sr-1 during the day), Radiance accuracy: 10% for radiances higher than 70 mWm-2sr-1, 7 mWm-2sr-1 for radiances lower than 70 mWm-2sr-1
LIS Lightning Imaging Sensor NASA	TRMM	Operational	Lightning sensors	Global distribution and variability of total lightning. Data can be related to rainfall to study hydrological cycle.	Waveband: NIR: 0.7774 µm Spatial resolution: 4 km Swath width: FOV: 80 x 80 deg Accuracy: 90% day and night detection probability
LISS-III (Resourcesat) Linear Imaging Self Scanner - III (Resourcesat) ISRO	RESOURCESAT-1, RESOURCESAT-2, RESOURCESAT-2A	Operational	High resolution optical imagers	Data used for vegetation type assessment, resource assessment, crop stress detection, crop production forecasting, forestry, land use and land cover change.	Waveband: VIS: Band 2: 0.52 - 0.59 µm, Band 3: 0.62 - 0.68 µm, NIR: Band 4: 0.77 - 0.86 µm, SWIR: Band 5: 1.55 - 1.75 µm Spatial resolution: 23.5 m Swath width: 141 km Accuracy:
LISS-IV Linear Imaging Self Scanner - IV ISRO	RESOURCESAT-1, RESOURCESAT-2, RESOURCESAT-2A	Operational	High resolution optical imagers	Vegetation monitoring, improved crop discrimination, crop yield, disaster monitoring and rapid assessment of natural resources.	Waveband: VIS: 0.52 - 0.59 µm, 0.62 - 0.68 µm, NIR: 0.77 - 0.86 µm Spatial resolution: 5.8 m Swath width: 70 km Accuracy:
LiV HYSI Limb Viewing Hyperspectral Imager VNIR ISRO	YOUTHSAT	Operational	Atmospheric chemistry	Airglow measurement of Ionosphere through 80 - 600 km.	Waveband: 512 bands Spatial resolution: 2 km (vertical), 25 km (horizontal) Swath width: 512 km (vertical), 1024 km (horizontal-spectral) Accuracy:
LM Lightning Mapper NRSCC (NSMC-CMA, CAST)	FY-4A, FY-4B, FY-4C, FY-4D, FY-4E	Approved	Lightning sensors	Lightning mapping for locating thunder storms in flooding season, CCD camera operating 0.77 µm to count flashes and intensity.	Waveband: 0.774 µm Spatial resolution: 10 km Swath width: Full Earth disk Accuracy: 8 km
LRA Laser Retroreflector Array NASA (ASI)	Jason-1, Jason-3, OSTM (Jason-2), SWOT	Operational	Precision orbit	Baseline tracking data for precision orbit determination and/or geodesy. Also for calibration of radar altimeter bias. Several types used on various missions. (ASI involved in LAGEOS 2 development).	Waveband: Spatial resolution: Swath width: Accuracy: 2 cm overhead ranging
LRA (LAGEOS) Laser Retroreflector Array ASI	LAGEOS-1, LAGEOS-2	Operational	Precision orbit	Baseline tracking data for precision geodesy. Also for calibration of radar altimeter bias. Several types used on various missions.	Waveband: VIS: 400 - 750 nm Spatial resolution: N/A Swath width: N/A Accuracy: 2 cm overhead ranging
LRIT Low-Rate Information Transmission NOAA	GOES-12, GOES-13, GOES-14, GOES-15, NOAA-19	Operational	Communications	Follow-on from the Weather Facsimile (WEFAX) Processing System.	Waveband: Spatial resolution: Swath width: Accuracy:
LRR Laser retro-Reflector ESA	GOCE	Operational	Precision orbit	Satellite Laser Ranging of GOCE, used for precise positioning and for geodynamics on GOCE.	Waveband: Spatial resolution: Swath width: Accuracy:
Mach-Zehnder Micro-interferometer ASI	MIOSAT	Approved	Atmospheric chemistry	Spectral radiance. Detection of the atmospheric gases.	Waveband: 400 - 4500 nm Spatial resolution: Ground Spot = 5 km Swath width: 5 km Accuracy: average spectral resolution: 1 nm
MADRAS Microwave Analysis and Detection of Rain and Atmospheric Structures ISRO (CNES)	MEGHA-TROPIQUES	Operational	Imaging multi-spectral radiometers (passive microwave)	To estimate rainfall, atmospheric water parameters and ocean surface winds in the equatorial belt.	Waveband: 18.7 GHz, 23.8 GHz, 36.5 GHz, 89 GHz, 157 GHz Spatial resolution: 40 km Swath width: 1700 km Accuracy:
MAESTRO Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation CSA	SCISAT-1	Operational	Atmospheric chemistry	Chemical processes involved in the depletion of the ozone layer.	Waveband: UV - NIR: 0.285 - 1.03 µm (1 - 2 nm spectral resolution) Spatial resolution: Approx 1 - 2 km vertical Swath width: Accuracy:
Magnetometer (NOAA) Magnetometer NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Approved	Magnetic field		Waveband: Spatial resolution: Swath width: Accuracy:
MCSI Multiple Channel Scanning Imager NRSCC (NSMC-CMA, CAST)	FY-4A, FY-4B, FY-4C, FY-4D, FY-4E	Approved	Imaging multi-spectral radiometers (vis/IR)	Multipurpose visible/IR imagery and wind derivation.	Waveband: 12 channels from 0.55 - 13.8 µm Spatial resolution: 1 km VIS, 2 km NIR, 4 km TIR Swath width: Full Earth disk Accuracy: 0.5 - 4.0 km
MERSI Medium Resolution Spectral Imager NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurement of vegetation indexes and ocean colour.	Waveband: 25 channels from 0.47 - 12.0 µm Spatial resolution: 250 m for broadband channels, 1 km for narrowband channels Swath width: 2800 km Accuracy: 0.25 - 1.0 km
MERSI-2 Improved Medium Resolution Spectral Imager NRSCC (NSMC-CMA, CAST)	FY-3D, FY-3E, FY-3F, FY-3G	Approved	Imaging multi-spectral radiometers (vis/IR)	Measurement of vegetation indexes and ocean colour.	Waveband: Spatial resolution: Swath width: Accuracy:
Meteosat Comms Communications package for Meteosat EUMETSAT	Meteosat-7	Operational	Communications	Communication package onboard Meteosat series satellites.	Waveband: Spatial resolution: Swath width: Accuracy:
METimage Multi Spectral Imager EUMETSAT (DLR)	EPS-SG-a, Sentinel-5	Proposed	Imaging multi-spectral radiometers (vis/IR)	Operational multi spectral imager for meteorological Post-EPS VIS/IR Imaging Mission (VII).	Waveband: UV-TIR (No of Channels and centre wavelengths tbd by EUMETSAT Post-EPS MRD) Spatial resolution: 250 - 500 m (TBD by EUMETSAT Post-EPS MRD) Swath width: 2800 km (+/-55°) (TBD by EUMETSAT Post-EPS MRD) Accuracy:
MHS Microwave Humidity Sounder EUMETSAT	Metop-A, Metop-B, Metop-C, NOAA-18, NOAA-19	Operational	Atmospheric temperature and humidity sounders	Atmospheric humidity profiles, cloud cover, cloud liquid, water content, ice boundaries and precipitation data.	Waveband: Microwave: 89 GHz, 166 GHz and 3 channels near 183 GHz Spatial resolution: Vertical: 3 - 7 km, Horizontal: 30 - 50 km Swath width: 1650 km Accuracy: Cloud water profile: 10 g/m2, specific humidity profile: 10 - 20%

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
MI Meteorological Imager KARI	COMS	Operational	Imaging multi-spectral radiometers (vis/IR)	Continuous monitoring capability for the near real-time generation of high-resolution meteorological products and long-term change analysis of sea surface temperature and cloud coverage.	Waveband: 1: VIS, 0.55 - 0.80 µm; 2: SWIR: 3.50 - 4.00 µm; 3: WV (Waver Vapour): 6.50 - 7.00 µm; 4: TIR1 (Thermal Infrared 1): 10.3 - 11.3 µm, 5: TIR2 (Thermal Infrared 2): 11.5 - 12.5 µm Spatial resolution: VIS: 1 km, IR: 4 km Swath width: Full Earth disk Accuracy:
Microwave limb sounder (GACM) NASA	GACM	Proposed	Atmospheric chemistry	Limb-viewing measurements of O3, N2O, temperature, water vapour, CO, HNO3, ClO, and volcanic SO2 in the.	Waveband: Spatial resolution: Swath width: Accuracy:
MIRAS Multichannel Infrared Atmospheric Sounder NRSCC (CAST)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Prototype	Imaging multi-spectral radiometers (passive microwave)		Waveband: Spatial resolution: Swath width: Accuracy:
MIRAS (SMOS) Microwave Imaging Radiometer using Aperture Synthesis (MIRAS) ESA	SMOS	Operational	Imaging multi-spectral radiometers (passive microwave) and multiple direction/polarisation radiometers	Objective is to demonstrate observations of sea surface salinity and soil moisture in support of climate, meteorology, hydrology, and oceanography applications.	Waveband: L-Band 1.41 GHz Spatial resolution: 33 - 50 km depending on the position in the swath - resampled to 15 km grid Swath width: Hexagon shape, nominal width 1050 km allowing a 3 day revisit time at the equator Accuracy: 2.6 K absolute accuracy, RMS 1.6-4 K depending on the scene and the position within the swath
MIRS Middle IR Scanner NSAU	Sich-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Scanner images of land surface in middle infra-red range.	Waveband: NIR: 1.55 - 1.7 µm Spatial resolution: 41.4 m Swath width: 55.3 km pointable ±35° from nadir Accuracy: 8 bits
MISR Multi-angle Imaging SpectroRadiometer NASA	Terra	Operational	Multiple direction/polarisation radiometers	Measurements of global surface albedo, aerosol and vegetation properties. Also provides multi-angle bidirectional data (1% angle-to-angle accuracy) for cloud cover and reflectances at the surface and aerosol opacities. Global and local modes.	Waveband: VIS: 0.44 µm, 0.56 µm, 0.67 µm, NIR: 0.86 µm Spatial resolution: 275 m, 550 m or 1.1 km, Summation modes available on selected cameras/bands: 1 x 1, 2 x 2, 4 x 4, 1 x 4. 1 pixel = 275 x 275 m Swath width: 380 km common overlap of all 9 cameras Accuracy: 0.03% hemispherical albedo, 10% aerosol opacity, 1-2% angle to angle accuracy in bidirectional reflectance
MLS (EOS-Aura) Microwave Limb Sounder (EOS-Aura) NASA	Aura	Operational	Atmospheric temperature and humidity sounders	Measures lower stratospheric temperature and concentration of H2O, O3, ClO, HCl, OH, HNO3, N2O and SO2.	Waveband: Microwave: 118 GHz, 190 GHz, 240 GHz, 640 GHz and 2.5 THz Spatial resolution: 3 x 300 km horizontal x 1.2 km vertical Swath width: Limb scan 2.5 - 62.5 km Limb to limb Accuracy: Temperature: 4 K, Ozone: 50%
MMP Magnetic Mapping Payload JPL, DNSC (CONAE)	SAC-C	Operational	Magnetic field	Measurement of the Earth's magnetic field with a vector and a scalar magnetometer.	Waveband: Spatial resolution: Swath width: Accuracy:
MMRS Multispectral Medium Resolution Scanner CONAE	SAC-C	Operational	Imaging multi-spectral radiometers (vis/IR)	Applications related to agriculture, environment, forestry, hydrology, oceanography, mineralogy and geology, desertification, contamination and protection of ecosystems.	Waveband: VIS - NIR: 480 - 500 nm, 540 - 560 nm, 630 - 690 nm, 795 - 835 nm, SWIR: 1550 - 1700 nm Spatial resolution: 175 m Swath width: 360 km Accuracy:
MODIS MODerate-Resolution Imaging Spectroradiometer NASA	Aqua, Terra	Operational	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Data on biological and physical processes on the surface of the Earth and in the lower atmosphere, and on global dynamics. Surface temperatures of land and ocean, chlorophyll fluorescence, land cover measurements, cloud cover (day and night).	Waveband: VIS - TIR: 36 bands in range 0.4 - 14.4 µm Spatial resolution: Cloud cover: 250 m (day) and 1000 m (night), Surface temperature: 1000 m Swath width: 2330 km Accuracy: Long wave radiance: 100 nW/m2, Short wave radiance: 5%, Surface temperature of land: <1 K, Surface temperature of ocean: <0.2 K, Snow and ice cover: 10%
MOPITT Measurements Of Pollution In The Troposphere CSA (NASA)	Terra	Operational	Atmospheric chemistry	Measurements of CO in the troposphere.	Waveband: SWIR-MWIR: 2.3 µm, 2.4 µm and 4.7 µm Spatial resolution: CO profile: 4 km vertical, 22 x 22 km horizontal, CO, CH4 column: 22 x 22 km horizontal Swath width: 616 km Accuracy: Carbon monoxide (4 km layers): 10%
MS (GISTDA) Multi spectral imager GISTDA	THEOS	Operational	Imaging multi-spectral radiometers (vis/IR)	THEOS MS consists of 4 spectral bands (R,G,B, NIR) with resolution 15 m and swath width at 90 km. The applications which are suitable for this instrument such as cartography, land use, land cover change management, agricultural and natural resources management, etc.	Waveband: 0.45 - 0.52 µm, 0.53 - 0.60 µm, 0.62 - 0.69 µm, 0.77 - 0.90 µm Spatial resolution: 15 m Swath width: 90 km Accuracy: GSD for MS = 15 m +/- 10% MTF for MS > 0.12 in each band
MSC Multi-Spectral Camera KARI	KOMPSAT-2	Operational	High resolution optical imagers	High resolution imager for land applications of cartography and disaster monitoring.	Waveband: Panchromatic VIS: 0.50 - 0.90 µm, VIS: 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.63 - 0.69 µm, NIR: 0.76 - 0.90 µm Spatial resolution: Pan: 1 m; VNIR: 4 m Swath width: 15 km Accuracy:
MSG Comms Communications package for MSG EUMETSAT	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Communications	Communication package onboard MSG series satellites.	Waveband: Spatial resolution: Swath width: Accuracy:
MSI Multi Spectral Imager DLR	RapidEye	Operational	High resolution optical imagers	High resolution images with short observing cycle for commercial and scientific applications.	Waveband: 4 VIS + 1 NIR band: 440 - 510 nm, 520 - 590 nm, 630 - 685 nm, 690 - 730 nm, 760 - 850 nm Spatial resolution: 6.5 m Swath width: 78 km Accuracy: 2 - 3%
MSI (EarthCARE) Multi-Spectral Imager (EarthCARE) ESA	EarthCARE	Approved	Imaging multi-spectral radiometers (vis/IR)	Observation of cloud properties and aerosol (aerosols to be confirmed).	Waveband: VIS - NIR: Band1: VIS, 670 nm, Band2: NIR, 865 nm, Band3: SWIR-1, 1.67 µm, Band4: SWIR-2, 2.21 µm, Thermal Infrared: Band5: 8.8 µm, Band6: 10.8µm, Band7: 12.0 µm Spatial resolution: 500 x 500 m Swath width: 150 km swatch with, asymmetrically; 35 km to 115 km versus nadir point Accuracy:
MSI (Sentinel-2) Multi-Spectral Instrument (Sentinel-2) ESA (EC)	Sentinel-2 A, Sentinel-2 B, Sentinel-2 C	Being developed	High resolution optical imagers	Optical high spatial resolution imagery over land and coastal areas for GMES operational services.	Waveband: 13 bands in the VNIR-SWIR Spatial resolution: 10 m for 4 bands in VNIR, 60 m for 3 dedicated atmospheric correction bands, 20 m for remaining bands Swath width: 290 km Accuracy: Absolute radiometric accuracy for Level 1C data: 3 - 5%
MSS (Kanonpus) Multispectral imaging system ROSKOSMOS (ROSHYDROMET)	Kanopus-V N1, Kanopus-V N2	Operational	High resolution optical imagers	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.5 - 0.6 µm; 0.6 - 0.7 µm; 0.7 - 0.8 µm; 0.8 - 0.9 µm Spatial resolution: 12 m Swath width: 20 km Accuracy:
MSS (Landsat) Multispectral Scanner USGS (NASA)	Landsat-5	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance. Data mostly used for land applications.	Waveband: VIS - NIR: 4 bands: 0.5 - 1.1 µm Spatial resolution: VIS-NIR: 80 m Swath width: 185 km Accuracy:
MSS (Sich) Multispectral Scanner NSAU	Sich-2	Operational	High resolution optical imagers	Multispectral scanner images of land surface.	Waveband: VIS - NIR: 0.51 - 0.90 µm; VIS: 0.51 - 0.59 µm, 0.61 - 0.68 µm; NIR: 0.80 - 0.89 µm Spatial resolution: 8.2 m Swath width: 46.6 km pointable ±35° from nadir Accuracy: 8 bits
MSU-200 Multispectral high resolution scanner (VIS) ROSKOSMOS (ROSHYDROMET)	Kanopus-V N1, Kanopus-V N2	Operational	High resolution optical imagers	Multispectral images of land & sea surfaces and ice cover.	Waveband: 0.54 - 0.86 µm Spatial resolution: 25 m Swath width: 250 km Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
MSU-GS Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS)	Arctica, Elektro-L N1, Elektro-L N2, Elektro-L N3	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, albedo, vegetation, convection, air mass analysis, tropopause monitoring, stability monitoring, total ozone and surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.65 µm, 0.65 - 0.8 µm (broadband), NIR: 0.9 µm, MWIR: 3.5 - 4.01 µm, TIR: 5.7 - 7.0 µm, 8 µm, 8.7 µm, 9.7 µm, 10.2 - 11.2 µm, 11.2 - 12.5 µm Spatial resolution: 1 km for VIS and 4 km for IR channels Swath width: Full Earth disk Accuracy: VIS: 5%; IR: 0.35 K
MSU-MR Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (vis/IR)	Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection.	Waveband: VIS: 0.5 - 0.7 µm; NIR: 0.7 - 1.1 µm; SWIR: 1.6 - 1.8 µm; MWIR: 3.5 - 4.1 µm; TIR: 10.5 - 11.5 µm, 11.5 - 12.5 µm Spatial resolution: 1 km Swath width: 3000 km Accuracy: VIS: 0.5%; IR: 0.1 - 0.2 K
MTSAT Comms Communications package for MTSAT JMA	MTSAT-1R, MTSAT-2	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
MTSAT DCS Data Collection System for MTSAT JMA	MTSAT-1R, MTSAT-2	Operational	Data collection		Waveband: Spatial resolution: Swath width: Accuracy:
MTVZA Scanning microwave imager-sounder ROSHYDROMET (ROSKOSMOS)	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging multi-spectral radiometers (passive microwave)	Atmospheric temperature and humidity profiles, precipitation, sea-level wind speed, snow/ice coverage.	Waveband: 10.6 - 183.3 GHz, 26 channels Spatial resolution: 12 - 75 km Swath width: 2600 km Accuracy: 0.4 - 2.0 K depending on spectral band
Multi-band UV/VIS Spectrometer (ACE) NASA	ACE	Proposed	Ocean colour instruments	Ocean colour spectrometer for measuring ocean leaving light which contains information on biological components.	Waveband: Spatial resolution: Swath width: Accuracy:
Multi-spectral thermal infrared imager (HyspIRI) NASA	HyspIRI	Proposed	Imaging multi-spectral radiometers (vis/IR)	Ecosystem focused mission with measurements of surface and cloud imaging with high spatial resolution, stereoscopic observation of local topography, cloud heights, volcanic plumes, and generation of local surface digital elevation maps, surface temperature and emissivity.	Waveband: 3-5 µm, 7.5-12 µm Spatial resolution: 60 m at nadir; 1 week revisit time Swath width: 600 km Accuracy: 0.1 K, <.01 µm
MUS-L Multi-spectral Optical Camera Low Resolution CONAE	SAC-E/SABIA_MAR-B	Approved	Ocean colour instruments	Sea and coastal studies.	Waveband: Optical and Thermal Infrared Cameras, up to 19 bands Spatial resolution: 1000 m Swath width: 2600 km Accuracy:
MUS-M Multi-spectral Optical Camera Medium Resolution CONAE	SAC-E/SABIA_MAR-A	Approved	Ocean colour instruments	Coastal studies.	Waveband: Optical and Thermal Infrared Cameras, up to 19 bands Spatial resolution: 200 m Swath width: 650 km Accuracy:
MUX Multispectral CCD Camera INPE (CAST)	CBERS-3, CBERS-4	Being developed	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 20 m Swath width: 120 km Accuracy:
MUX (ZY-3) Multispectral CCD Camera CRESDA	ZY-3	Operational	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 6 m Swath width: 52 km Accuracy:
MVIRI METEOSAT Visible and Infra-Red Imager EUMETSAT (ESA)	Meteosat-7	Operational	Imaging multi-spectral radiometers (vis/IR)	Measures cloud cover, motion, height, upper tropospheric humidity and sea surface temperature.	Waveband: VIS - NIR: 0.5 - 0.9 µm, TIR: 5.7 - 7.1 µm (water vapour), 10.5 - 12.5 µm Spatial resolution: Visible: 2.5 km, Water vapour: 5 km (after processing), TIR: 5 km Swath width: Full Earth disk in all three channels, every 30 minutes Accuracy: Cloud top height: 0.5 km, Cloud top/ sea surface temperature: 0.7 K, Cloud cover 15%
MVIRS Moderate Resolution Visible and Infrared Imaging Spectroradiometer NRSCC (CAST)	FY-3F, FY-3G	Approved	Imaging multi-spectral radiometers (vis/IR)	Measures surface temperature and cloud and ice cover. Used for snow and flood monitoring and surface temperature.	Waveband: VIS - TIR: 0.47 - 12.5 µm (20 channels) Spatial resolution: Swath width: Accuracy:
MWAS MicroWave Atmospheric Sounder NRSCC (CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: Swath width: Accuracy:
MWHS MicroWave Humidity Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: 15 km at media, 41 x 27 km at outer edge Swath width: 2700 km Accuracy: 15 km
MWHS-2 Improved MicroWave Humidity Sounder CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Prototype	Atmospheric temperature and humidity sounders	Meteorological applications.	Waveband: Spatial resolution: Swath width: Accuracy:
MWI Microwave Imager EUMETSAT	EPS-SG-b	Proposed	Imaging multi-spectral radiometers (passive microwave)	Instrument TBC.	Waveband: Spatial resolution: Swath width: Accuracy:
MWR MicroWave Radiometer CONAE	SAC-D/Aquarius	Operational	Multiple direction/polarisation radiometers	Precipitation rate, wind speed, sea ice concentration, water vapour, clouds liquid water.	Waveband: (K Band) 23.8 GHz V Pol and 36.5 GHz H and V Pol Eight beams per frequency Spatial resolution: <54 km Swath width: 380 km Accuracy: .1 K
MWRI MicroWave Radiation Imager NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C, FY-3D, FY-3F	Operational	Imaging multi-spectral radiometers (passive microwave)	All weather observations of precipitation, cloud features, vegetation, soil moisture sea ice, etc.	Waveband: 12 channels, 6 frequencies: 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89 GHz, 150 GHz Spatial resolution: 7.5 x 12 km at 150 GHz to 51 x 85 km at 10.65 GHz Swath width: 1400 km Accuracy:
MWS Microwave Sounder EUMETSAT (ESA)	EPS-SG-a, EPS-SG-b	Proposed	Atmospheric temperature and humidity sounders		Waveband: 25 channels from 23.8 to 229 GHz Spatial resolution: Footprint size 17 - 80 km (Threshhold) Swath width: Accuracy:
MWTS Microwave Temperature Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Atmospheric temperature and humidity sounders	Temperature sounding in nearly all weather conditions.	Waveband: 50.3 GHz, 53.6 GHz, 54.94 GHz, 57.29 GHz Spatial resolution: 62 km Swath width: 750 - 1125 km Accuracy: 50 - 75 km
MWTS-2 Improved Microwave Temperature Sounder CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F, FY-3G	Prototype	Atmospheric temperature and humidity sounders	Temperature sounding in nearly all weather conditions.	Waveband: Spatial resolution: Swath width: Accuracy:
MX (IRS-1A)-VNIR Multispectral VNIR ISRO	CARTOSAT-1A, CARTOSAT-1B	Proposed	Imaging multi-spectral radiometers (vis/IR)		Waveband: VNIR Multispectral Spatial resolution: 2.5 m Swath width: 60 km Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
MxT Multi-spectral CCD Camera ISRO	IMS-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Natural resources management.	Waveband: VIS: Band 1: 0.45 - 0.52 µm, Band 2: 0.52 - 0.59 µm, Band 3: 0.62 - 0.68 µm, NIR: Band 4: 0.77 - 0.86 µm Spatial resolution: 37 m Swath width: 151 km Accuracy:
Next Gen APS (ACE) NASA	ACE, PACE	Proposed	Multiple direction/polarisation radiometers	Polarimeter for measuring aerosol optical properties and aerosol types.	Waveband: Spatial resolution: Swath width: Accuracy:
NigeriaSat Medium and High Resolution NigeriaSat Remote Sensing (Medium and High Resolution) NASRDA	NigeriaSat-2	Operational	High resolution optical imagers	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: NIR: ~0.75 - ~1.3 µm, VIS: ~0.40 - ~0.75 µm Spatial resolution: 2.5 PAN, 5 m multispectral (red blue green,NIR), 32 m multispectral (red, green, NIR) Swath width: 20 x 20 km , 300 x 300 km Accuracy: 35 - 45 m
NigeriaSat Medium Resolution NigeriaSat Remote Sensing (Medium Resolution) NASRDA	NigeriaSat-X	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: NIR: ~0.75 - ~1.3 µm, VIS: ~0.40 - ~0.75 µm Spatial resolution: 22 m multispectral (red, green and NIR) Swath width: 600 x 600 km Accuracy: 150 - 300 m
NIRST New Infrared Sensor Technology CONAE (CSA)	SAC-D/Aquarius	Operational	Imaging multi-spectral radiometers (vis/IR)	NIRST makes use of two linear microbolometric arrays, respectively sensitive to the midwave and longwave infra-red bands, to perform pushbroom scan measurements. It measures the char-acteristics of forest fires and other thermal events on land, such as temperature and released energy, in the thermal range from 300 to 700 K. NIRST will also measure sea surface temperatures (250 to 500 K) over selected targets to support Aquarius instrument corrections.	Waveband: NIRST has one midwave infrared band and two longwave infrared bands • Band 1: 3.4-4.2 um • Band 2: 10.4-11.3 um • Band 3: 11.4-12.3 um Spatial resolution: Space resol: 350 m (at nadir) Swath width: Instant: 182 km; Extended: 1000 km Accuracy: Band 1: 2.5 K @400 K; Band 2: 1.5 K @300 K; Band 3: 2.0 K @300 K
NISTAR NIST active Cavity Radiometer NASA (NOAA)	DSCOVR	Being developed	Earth radiation budget radiometers	Measure the energy emitted and reflected by the Earth.	Waveband: 0.2 - 100 µm in 4 channels Spatial resolution: Swath width: Accuracy: 0.1% accuracy; 0.03% precision
NOAA Comms Communications package for NOAA NOAA	NOAA-15, NOAA-16, NOAA-17, NOAA-18, NOAA-19	Operational	Communications		Waveband: Spatial resolution: Swath width: Accuracy:
OCM Ocean Colour Monitor ISRO	OCEANSAT-2	Operational	Ocean colour instruments	Ocean colour data, Estimation of phytoplankton concentration, identification of potential fishing zones, assessment of primary productivity.	Waveband: VIS - NIR: 0.40 - 0.88 µm (8 channels) Spatial resolution: 236 x 360m Swath width: 1440 km Accuracy:
OCM (Oceansat-3/3A) Ocean Colour Monitor (Oceansat-3/3A) ISRO	OCEANSAT-3, OCEANSAT-3A	Proposed	Ocean colour instruments	Ocean colour data, Estimation of phytoplankton concentration, identification of potential fishing zones, assessment of primary productivity.	Waveband: 12 channel Spatial resolution: Swath width: Accuracy:
OCS Ocean colour scanner ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Being developed	Ocean colour instruments	Ocean colour data, estimation of phytoplankton concentration.	Waveband: 0.41 - 0.9 µm, 8 channels Spatial resolution: 1 km Swath width: 3000 km Accuracy: TBD
OES Ocean Ecosystem Spectrometer NASA	PACE	Proposed	Ocean colour instruments	Ocean colour spectrometer for measuring ocean leaving light which contains information on biological components.	Waveband: Near UV-VIS (360 - 710 nm); NIR (748 - 865 nm); SWIR (1245, 1640, 2135 nm) Spatial resolution: 1 km Swath width: 2500 km swath Accuracy:
OLCI Ocean and Land Colour Imager ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Marine and land services.	Waveband: 21 bands in VNIR/SWIR Spatial resolution: 300 m Swath width: 1270 km, across-track tilt 12.2 deg to the West Accuracy: 2% abs, 0.1% rel.
OLI Operational Land Imager NASA (USGS)	LDCM	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, land cover state and change (eg vegetation type). Used as multi-purpose imagery for land applications.	Waveband: VIS - SWIR: 9 bands: 0.43 - 2.3 µm Spatial resolution: Pan: 15 m, VIS - SWIR: 30 m Swath width: 185 km Accuracy: Absolute geodetic accuracy of 65 m; relative geodetic accuracy of 25 m (excluding terrain effects); geometric accuracy of 12 m or better
OLS Operational Linescan System NOAA (DoD (USA))	DMSP F-14, DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Imaging multi-spectral radiometers (vis/IR)	Day and night cloud cover imagery.	Waveband: VIS - NIR: 0.4 - 1.1 µm, TIR: 10.0 - 13.4 µm, and 0.47 - 0.95 µm Spatial resolution: 0.56 km (fine), 5.4 km (stereo products) Swath width: 3000 km Accuracy:
OMI Ozone Measuring Instrument NSO (NASA)	Aura	Operational	Atmospheric chemistry	Mapping of ozone columns, key air quality components (NO2, SO2, BrO, OClO and aerosols), measurements of cloud pressure and coverage, global distribution and trends in UV-B radiation.	Waveband: UV: 270 - 314 nm and 306 - 380 nm, VIS: 350 - 500 nm Spatial resolution: 13 x 24 km or 36 x 48 km depending on the product. Also has zoom modes (13 x 13 km) for example for urban pollution detection Swath width: 2600 km Accuracy:
OMPS Ozone Mapping and Profiler Suite NOAA	JPSS-1, JPSS-2, Suomi NPP	Operational	Atmospheric chemistry	Measures total amount of ozone in the atmosphere and the ozone concentration variation with altitude.	Waveband: Nadir Mapper: UV 0.3 - 0.38 µm, Nadir profiler: UV 0.25 - 0.31 µm, Limb soundings: UV - TIR 0.29 - 10 µm Spatial resolution: Mapper: 50 km, Profiler: 250 km, Limb: 1 km vertical Swath width: Mapper: 2800 km, Profiler: 250 km, Limb: 3 vertical slits along track +/- 250 km Accuracy: Total Ozone 15 Dobson units. Profile Ozone 10% between 15 and 60 km; 20% between Tropopause and 15 km
OMS Ozone Monitoring Suite CAST (NSMC-CMA)	FY-3E, FY-3G	TBD	Atmospheric chemistry	Ozone total column vertical profile measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
OSIRIS Optical Spectrograph and Infra-Red Imaging System CSA (SNSB)	Odin	Operational	Atmospheric chemistry	Detects aerosol layers and abundance of species such as O3, NO2, OClO, BrO and NO. Consists of spectrograph and IR imager.	Waveband: Spectrograph: UV - NIR: 0.28 - 0.80 µm; IR Imager: NIR: 1.26 µm, 1.27 µm, 1.52 µm Spatial resolution: Spectrograph 1 km at limb, Imager 1 km in vertical Swath width: N/A, but measures in the altitude range 5 - 100 km Accuracy: Depends on species. Ozone meets requirements for trend analysis
Overhauser Magnetometer OM CNES	Ørsted (Oersted)	Operational	Magnetic field	Measurements of the strength of the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
PALSAR-2 (ALOS-2) Phased Array type L-band Synthetic Aperture Radar-2 JAXA	ALOS-2	Being developed	Imaging microwave radars	Disaster Monitoring, Land monitoring, Agricultural Monitoring, Natural Resource Exploration, Global Forest Monitoring, Potential use and interferometry.	Waveband: Microwave: L-Band 1270 MHz Spatial resolution: Spotlight mode (1 to 3 m), stripmap mode (3 to 10 m). Swath width: Spotlight mode: 25km, Stripmap mode: 50-70 km, Scan SAR mode: 350 - 490 km, Polarimetry: 30-50 km Accuracy: Surface Resolution: 1 to 3 m (Spotlight Mode), 3m (Ultra-Fine Mode), 6m (High sensitive Mode), 10m (Fine Mode),100 m (Scan Mode); Radiometric: ±1 dB
Pamela ROSKOSMOS	Resurs DK 1, Resurs P N1, Resurs P N2	Operational	Space environment	Cosmic ray research.	Waveband: Spatial resolution: Swath width: Accuracy:
PAN (Cartosat-1) Panchromatic Camera ISRO	CARTOSAT-1	Operational	High resolution optical imagers	High resolution stereo images for study of topography, urban areas, development of DTM, run-off models etc. Urban sprawl, forest cover/timber volume, land use change.	Waveband: Panchromatic VIS: 0.5 - 0.75 µm Spatial resolution: 2.5 m Swath width: 30 km Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
PAN (Cartosat-2) Panchromatic Camera ISRO	CARTOSAT-2	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 1 m Swath width: 10 km Accuracy:
PAN (Cartosat-2A/2B) Panchromatic Camera ISRO	CARTOSAT-2A, CARTOSAT-2B	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 1 m Swath width: 10 km Accuracy:
PAN (Cartosat-2C) Panchromatic Camera ISRO	CARTOSAT-2C	Operational	High resolution optical imagers	High resolution stereo images for large scale (better than 1:0000) mapping applications, urban applications, GIS ingest.	Waveband: VIS: 0.5 - 0.75 µm Spatial resolution: 0.8 m Swath width: 10 km Accuracy:
PAN (Cartosat-3/3A) Panchromatic sensor ISRO	CARTOSAT-3, CARTOSAT-3A	Being developed	High resolution optical imagers	High resolution images for study of topography, urban areas, development of DTM, run-off models etc. Urban sprawl, forest cover/timber volume, land use change.	Waveband: Panchromatic VIS: 0.5 - 0.75 µm Spatial resolution: 0.3 m Swath width: 15 km Accuracy:
PAN (CBERS) Panchromatic and multispectral imager CAST (INPE)	CBERS-3, CBERS-4	Being developed	High resolution optical imagers	Earth resources, environmental monitoring, land use, urban studies.	Waveband: 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm, 0.51 - 0.85 µm Spatial resolution: 5 m panchromatic and 10 m multispectral Swath width: 60 km Accuracy:
PAN (GISTDA) Panchromatic imager GISTDA	THEOS	Operational	High resolution optical imagers	THEOS PAN is an optical instrument with resolution 2 m and swath width at 22 km. It can be used in several applications such as cartography, land use planning and management, national security, etc.	Waveband: 0.45 - 0.90 µm Spatial resolution: 2 m Swath width: 22 km Accuracy: GSD for PAN = 2 m +/- 10% MTF for PAN > 0.10
PAN (IRS-1A) PAN Fore and Aft ISRO	CARTOSAT-1A, CARTOSAT-1B	Proposed	High resolution optical imagers		Waveband: Panchromatic VIS: 0.5 - 0.75 µm Spatial resolution: 1.25 m Swath width: 60 km Accuracy:
PAN (ZY-02C) Panchromatic and multispectral imager CRESDA	ZY-02C	Operational	High resolution optical imagers	Earth resources, environmental monitoring, land use	Waveband: 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm, 0.51 - 0.85 µm Spatial resolution: 5 m panchromatic and 10 m multispectral Swath width: 60km Accuracy:
PAN CAM Panchromatic Camera ASI	MIOSAT	Approved	High resolution optical imagers	Panchromatic data.	Waveband: 400 - 900 nm Spatial resolution: 2 m Swath width: 10 km Accuracy: -
PAN CAMERA Panchromatic Camera ASI	PRISMA	Approved	High resolution optical imagers	Panchromatic data.	Waveband: VIS: 400 - 700 nm Spatial resolution: 5 m Swath width: 30 km Accuracy: -
PAN+MS (RGB+NIR) Ingenio PAN+MS (RGB+NIR) CDTI (ESA)	Ingenio	Being developed	High resolution optical imagers	High resolution multi–spectral land optical images for applications in cartography, land use, urban management, water management, agriculture and environmental monitoring, risk management and security.	Waveband: VIS+NIR band: 520 - 670 nm, 410 - 480 nm, 520 - 580 nm, 610 - 670 nm, 790 - 880 nm Spatial resolution: PAN: 2.5 m, MS: 10 m Swath width: Swath will move between 55 and 60 km depending on latitude. Accuracy: SNR: 100 in PAN and 120 in MS. The geo-location accuracy of level 1c PAN data product shall be better than or equal to 2.5 m RMS 2D in nadir view.
Paz SAR-X X Band Synthetic Aperture Radar CDTI	PAZ	Being developed	Imaging microwave radars	High resolution X-band radar for security, land use, urban management, environmental monitoring, risk management. Different acquisition modes: Spotlight (5 x 5-10 km SSD =<1 m), Scansar (100 x 100 km, SSD <=15 m); Stripmode (strips of 30 x 30 km with SSD 3 m).	Waveband: The Radar will use a frequency close to 9.65 GHz with an BW of 300 MHz. Spatial resolution: Resolution will move between <1 x 1 m and 6 x 18m depending on acquisition modes. Swath width: Swath will vary according to the acquisition mode: 5x5 km to 100 km x 100 km. Accuracy: Pixel Localization: Pixel Localization: 50 cm to 8.5 m (1s) depending of the product selected.
PCW PHEOS - Atmospheric Polar Highly Elliptical Orbit Science Weather, Climate & Air Quality Mission CSA	PCW-1, PCW-2	Proposed	Atmospheric chemistry	Complement PCW operational numerical weather prediction. Will also collect information about atmospheric gaseous and aerosol composition to better understand transport and climate processes. .	Waveband: 4 non-continuous bands from 0.758 - 14.3 um at a spectral sampling of 0.25 cm-1. Spatial resolution: 10 x 10 km Swath width: Field of View is 560 x 560km. Field of Regard is 3024 x 3530 km. Accuracy: Cal/Val requirements currently being developed
PCW PHEOS - Solar-Terrestrial Polar Highly Elliptical Orbit Science, Solar-Terrestrial Mission CSA	PCW-1, PCW-2	Proposed	Space environment	Combination of payloads to study the near-Earth space dominated by plasmas and to observe the electromagnetic and charged particle environments in a highly elliptical orbit. May potentially include both in-situ space weather instruments and an Auroral imager.	Waveband: Dual band LBH long (160 - 175 nm) and LBH short (140 - 160 nm) for the Auroral imager. N.A. for the in-situ space weather instruments. Spatial resolution: 40 km for the Auroral imager. Not applicable for the in-situ space weather instruments. Swath width: Field of Regard for each full acquisition is the entire Earth disc. N.A. for the in-situ space weather instruments. Accuracy: Cal/Val requirements currently being developed
PCWMP PCW Meteorological Payload (1 on each PCW S/C) CSA	PCW-1, PCW-2	Proposed	Imaging multi-spectral radiometers (vis/IR)	Continuous high-temporal resolution measurements of atmospheric properties over the Arctic. Associated observations, using additional instruments include in situ space weather and also broadband radiometry of Earth.	Waveband: Multiple bands, non-continuous, from 0.45 µm - 14.5 µm Spatial resolution: Band dependent, varies from 0.5 km GSD (goal) for some of the VNIR bands to 2 km GSD for TIR bands. Swath width: Field of Regard for each full acquisition is the entire Earth disc Accuracy: Cal/Val requirements currently being developed
PHA Pulse Height Analyzer NOAA (NASA)	DSCOVR	Being developed	Space environment		Waveband: Spatial resolution: Swath width: Accuracy:
Plasma-Mag NOAA (NASA)	DSCOVR	Being developed	Space environment	Magnetometer and plasma sensor to measure solar wind properties for forecasting geomagnetic storms	Waveband: Spatial resolution: Swath width: Accuracy:
Polarimeter NASA	PACE	Proposed			Waveband: Spatial resolution: Swath width: Accuracy:
POLDER-P POLarization and Directionality of the Earth's Reflectances (PARASOL version) CNES	PARASOL	Operational	Multiple direction/polarisation radiometers	Measures polarisation, and directional and spectral characteristics of the solar light reflected by aerosols, clouds, oceans and land surfaces.	Waveband: VIS - NIR: 0.490 µm, 0.670 µm and 0.865 µm at 3 polarisations, and 0.49 µm, 0.565 µm, 0.763 µm, 0.765 µm, 0.91 µm, and 1.02 µm with no polarisation Spatial resolution: 5.5 x 5.5 km Swath width: 1600 km Accuracy: Radiation budget, land surface, Reflectance: 2%
POSEIDON-2 (SSALT-2) Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES	Jason-1	Operational	Radar altimeters	Nadir viewing sounding radar for provision of real-time high precision sea surface topography, ocean circulation and wave height data.	Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Basic measurement: 1/sec (6 km along track), Raw measurement: 10/sec (600 m along track) Swath width: On baseline TOPEX/POSEIDON orbit (10 day cycle): 300 km between tracks at equator Accuracy: Sea level: 3.9 cm, Significant waveheight: 0.5 m, Horizontal sea surface wind speed: 2 m/s
POSEIDON-3 Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES	OSTM (Jason-2)	Operational	Radar altimeters	Nadir viewing sounding radar for provision of real-time high precision sea surface topography, ocean circulation and wave height data.	Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Basic measurement: 1/sec (6 km along track), Raw measurement: 10/sec (600 m along track) Swath width: On baseline TOPEX/POSEIDON orbit (10 day cycle): 300 km between tracks at equator Accuracy: Sea level: 3.9 cm, Significant wave height: 0.5 m, Horizontal sea surface wind speed: 2 m/s

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
POSEIDON-3B Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES	Jason-3	Operational	Radar altimeters	Nadir viewing sounding radar for provision of real-time high precision sea surface topography, ocean circulation and wave height data.	Waveband: Microwave: Ku-band (13.575 GHz), C-band (5.3 GHz) Spatial resolution: Basic measurement: 1/sec (6 km along track), Raw measurement: 20/sec (300 m along track) Swath width: On baseline TOPEX/POSEIDON orbit (10 day cycle): 300 km between tracks at equator Accuracy: Sea level: 3.4 cm, Significant wave height: 0.4 m, Horizontal sea surface wind speed: 1.5 m/s
PR Precipitation Radar JAXA (NASA)	TRMM	Operational	Cloud profile and rain radars	Measures precipitation rate in tropical latitudes.	Waveband: Microwave: 13.796 GHz and 13.802 GHz Spatial resolution: Range resolution: 250 m Horizontal resolution: 4.3 km at nadir (post-boost: 5 km) Swath width: 215 km (post-boost: 245 km) Observable range: from surface to approx 15 km altitude Accuracy: Rainfall rate 0.7 mm/h at storm top
PREMOS PREcision Monitoring of Solar Variability CNES	PICARD	Operational	Earth radiation budget radiometers	Solar UV and visible flux in selected wavelength bands.	Waveband: UV: 230 nm, 311 nm, 402 nm; VIS: 548 nm Spatial resolution: Swath width: Accuracy:
PRISM-2 (ALOS-3) Panchromatic Remote-sensing Instrument for Stereo Mapping-2 JAXA	ALOS-3	Proposed	High resolution optical imagers	Stereo imaging with high resolution and wide swath by panchromatic band for disaster monitoring, global mapping and so on.	Waveband: VIS - NIR: 0.52-0.77 µm Spatial resolution: GSD : 0.8m(nadir) Swath width: 50km Accuracy:
PSS Panchromatic imaging system ROSKOSMOS (ROSHYDROMET)	Kanopus-V N1, Kanopus-V N2	Operational	High resolution optical imagers	Panchromatic data for environmental monitoring, agriculture and forestry.	Waveband: 0.5 - 0.8 µm Spatial resolution: 2.5 m Swath width: 20 km Accuracy:
RaBIT Radio Beacon for Ionospheric Tomography ISRO	YOUTHSAT	Operational	Space environment	Total Electron Content of atmospheric flux & study structure and dynamics of equatorial ionosphere.	Waveband: 66.7 cm, 200 cm (RF) Spatial resolution: Swath width: Accuracy:
Radiomet Radio-occultation receiver ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Atmospheric temperature and humidity sounders	Atmospheric temperature and humidity profiles with high vertical resolution.	Waveband: Spatial resolution: Swath width: Accuracy:
RASAT VIS Multispectral RASAT VIS Multispectral camera TUBITAK	RASAT	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: Band 1: 0.42 - 0.55 µm, Band 2: 0.55 - 0.63 µm, Band 3: 0.58 - 0.73 µm Spatial resolution: 15 m Swath width: 30 km Accuracy:
RASAT VIS Panchromatic RASAR VIS Panchromatic camera TUBITAK	RASAT	Operational	Imaging multi-spectral radiometers (vis/IR)	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 0.42 - 0.73 µm Spatial resolution: 7.5 m Swath width: 30 km Accuracy:
RO EUMETSAT	EPS-SG-a, EPS-SG-b	Proposed		Instrument TBC.	Waveband: Spatial resolution: Swath width: Accuracy:
ROSA Radio Occultation Sensor for Atmosphere ISRO	MEGHA-TROPIQUES	Operational	Atmospheric temperature and humidity sounders	Enables measurement of water vapour and temperature profiles in the tropics.	Waveband: Spatial resolution: Swath width: Accuracy:
ROSA Radio Occultation Sounder for the Atmosphere ASI (CONAE)	SAC-D/Aquarius	Operational	Atmospheric temperature and humidity sounders and precision orbit	Climate change studies. High-vertical resolution temperature-humidity sounding for NWP. Space weather.	Waveband: Around 1600 MHz (L1) and 1200 MHz (L2). Spatial resolution: 300 km (horizontal), 0.5 km (vertical). Swath width: N/A (occultation); about 600 soundings/day. Accuracy: Bending angle: 0.5 µ rad
ROSA Radio Occultation Sounder for the Atmosphere ASI (ISRO)	OCEANSAT-2	Operational	Atmospheric temperature and humidity sounders and precision orbit	Climate change studies. High-vertical resolution temperature-humidity sounding for NWP. Space weather.	Waveband: Around 1600 MHz (L1) and 1200 MHz (L2). Spatial resolution: 300 km (horizontal), 0.5 km (vertical). Swath width: N/A (occultation); about 300 soundings/day. Accuracy: Bending angle: 0.5 µ rad
RRA Retroreflector Array CNES	Diademe 1&2	Operational	Precision orbit	Satellite laser ranging for geodynamic measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
S-Band SAR S-Band Synthetic Aperture Radar CAST	HJ-1C	Being developed	Imaging microwave radars	Radar measurements for natural and disaster monitoring.	Waveband: S-Band SAR Spatial resolution: 20 m (4 looks) Swath width: 100 km Accuracy: 3 dB
S&R Search and Rescue ROSKOSMOS	Elektro-L N1, Elektro-L N2, Elektro-L N3	Operational	Other	For emergency calls.	Waveband: Spatial resolution: Swath width: Accuracy:
S&R (GOES) Search and Rescue NOAA	GOES-12, GOES-13, GOES-14, GOES-15	Operational	Other	Satellite and ground based system to detect and locate aviators, mariners, and land-based users in distress.	Waveband: Spatial resolution: Swath width: Accuracy:
S&R (NOAA) Search and Rescue Satellite Aided Tracking NOAA	Free Flyer-1, Free Flyer-2, Metop-A, Metop-B, NOAA-15, NOAA-16, NOAA-17, NOAA-18, NOAA-19	Operational	Other	Satellite and ground based system to detect and locate aviators, mariners, and land-based users in distress.	Waveband: Spatial resolution: Swath width: Accuracy:
SAGE-III Stratospheric Aerosol and Gas Experiment NASA	SAGE-III	Being developed	Atmospheric chemistry	Limb-viewing measurements of aerosol, O3, H20, NO2, OClO, NO3, temperature and pressure in the stratosphere, upper troposphere, and mesosphere using solar occultation, lunar occultation and limb scatter measurement techniques.	Waveband: Nine spectral regions between 290 - 1550 nm Spatial resolution: 1 - 2 km vertical Swath width: N/A Accuracy: Aerosol profile: 5%, H20: 10 - 15%; NO2: 10-15%; NO3: 10%; O3: 5%; OClO: 25%; Pressure: 2%; Temperature Profile; 2K
SAPHIR Sondeur Atmospherique du Profil'd'Humidite Intertropicale par Radiometrie CNES	MEGHA-TROPIQUES	Operational	Atmospheric temperature and humidity sounders	Cross-track sounder with the objective of measuring water vapour profiles in the troposphere in six layers from 2 - 12 km altitudes.	Waveband: Microwave: 183.3 GHz (6 channels) Spatial resolution: 10 km Swath width: 2200 km Accuracy:
SAR Synthetic Aperture Radar X band ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Being developed	Imaging microwave radars	High resolution microwave radar images for ice watch.	Waveband: X-Band Spatial resolution: 1 m, 5 m, 50 m, 200 m, 500 m Swath width: 10 km, 50 km, 130 km, 600 km, 750 km Accuracy: 1 dB

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
SAR (RADARSAT-2) Synthetic Aperture Radar (CSA) C band CSA	RADARSAT-2	Operational	Imaging microwave radars	All-weather images of ocean, ice and land surfaces. Used for monitoring of coastal zones, polar ice, sea ice, sea state, geological features, vegetation and land surface processes.	Waveband: Microwave: C band 5.405 GHz. HH, VV, HV, VH polarization - includes Quad polarization imaging modes. Spatial resolution: Standard: 27 - 17 x 25 m (4 looks); Wide: 40 - 19 x 25 m (4 looks); Fine: 10 - 7 x 8 m (1 look); ScanSAR (N/W): 80 - 38 x 60 m / 160 - 172 x 100 m (4/8 looks), Extended (H/L): 18 - 16 x 25 m / 60 - 23 x 25 m (4 looks); Ultra-Fine: 4.6 - 2.1 x 2.8 m (1 look); Fine Quad-Pol: 14 - 8 x 8 m (1 look); Standard Quad-Pol: 24 - 17 x 8 m (1 look); Multi-Look Fine: 10 - 7 x 8 m (4 looks); Spotlight: 4.6 - 2.1 x 0.8 m (1 look); Swath width: Standard: 100 km (inc.: 20 - 49 deg); Wide: 150 km (inc.: 20 - 45 deg); Fine: 50 km (inc.: 30 - 50 deg); ScanSAR (N/W): 300/500 km (inc.: 20 - 46 / 20 - 49 deg); Extended (H/L): 75/170 km (inc.: 49 - 60 / 10 - 23 deg); Ultra-Fine: 20 km (inc.: 20 - 49 deg); Quad-Pol (Standard and Fine): 25 km (inc.: 20 - 41 deg); Multi-Look Fine: 50 km (inc.: 30 - 50 deg). Left- and right-looking capability; spotlight 18 km x 8 km; Accuracy: Relative Radiometric Accuracy (within a 100 km scene): <1 dB
SAR (RADARSAT) Synthetic Aperture Radar (CSA) C band CSA	RADARSAT-1	Operational	Imaging microwave radars	All-weather images of ocean, ice and land surfaces. Used for monitoring of coastal zones, polar ice, sea ice, sea state, geological features, vegetation and land surface processes.	Waveband: Microwave: C band 5.3 GHz, HH polarization. Spatial resolution: Nominal resolutions: Standard: 30 m (4 looks); Wide: 30 m (4 looks); Fine: 8 m (1 look); ScanSAR (N/W): 50 m / 100 m (4/8 looks); Extended (H/L): 18 - 27 m / 30 m (4/4 looks). Swath width: Standard: 100 km (inc.: 20 - 49 deg); Wide: 150 km (inc.: 20 - 45 deg), Fine: 45 km (inc.: 37 - 47 deg); ScanSAR (N/W): 300/500 km (inc.: 20 - 49 deg); Extended (H/L): 75/170 km (inc.: 52 - 58 / 10 - 22 deg). Accuracy: Geometric distortion: < 40 m Relative Radiometric Accuracy (within a 100km scene): <1 dB
SAR (RCM) Synthetic Aperture Radar (CSA) C band CSA	RADARSAT C-1, RADARSAT C-2, RADARSAT C-3	Being developed	Imaging microwave radars	All-weather, C-band data to support ecosystem monitoring, maritime surveillance and disaster management.	Waveband: Microwave: C band 5.405 GHz: HH, VV, HV, VH polarization - includes Quad polarization imaging mode and compact polarimetry. Spatial resolution: Low Resolution 100 m: 100 x 100 m (8 looks); Medium Resolution 50 m: 50 x 50 m (4 looks); Medium Resolution 16 m: 16 x 16 m (4 looks); Medium Resolution 30 m: 30 x 30 m (4 looks); High-Resolution 5 m: 5 x 5 m (1 look); Very High Resolution 3 m: 3 (@35deg) x 3 m (1 look); Spotlight: 3 (@35deg) x 1 m (1 look); Low Noise: 100 x 100 m (8 looks); Ship Detection: Variable. Swath width: Low Resolution 100 m: 500 km; Medium Resolution 50 m: 350 km; Medium Resolution 16 m: 30 km; Medium Resolution 30 m: 125 km; High-Resolution 5 m: 30 km; Very High Resolution 3 m: 20 km; Low Noise: 350 km; Spotlight: 5 km; Ship Detection: 350 km. Accuracy: Absolute Radiometric Accuracy: +/- 1.0 dB Scansar discontinuities: 0.2 dB
SAR (RISAT) Synthetic Aperature Radiometer (RISAT) ISRO	RISAT-1, RISAT-1A	Operational	Imaging microwave radars	Radar backscatter measurements of land, water and ocean surfaces for applications in soil moisture, crop applications (under cloud cover), terrain mapping, etc.	Waveband: C-Band (5.350 Ghz) Spatial resolution: 3 - 6 m (FRS-1), 9 - 12 m (FRS-2), 25/50 m (MRS/CRS) Swath width: 30 km (HRS), 30 km (FRS-1/FRS-2), 120/240 km (MRS/CRS) Accuracy:
SAR 2000 Synthetic Aperture Radar - 2000 ASI (MiD (Italy))	COSMO-SkyMed 1, COSMO-SkyMed 2, COSMO-SkyMed 3, COSMO-SkyMed 4	Operational	Imaging microwave radars	All-weather images of ocean, land and ice for monitoring of land surface processes, ice, environmental monitoring, risk management, environmental resources, maritime management, Earth topographic mapping.	Waveband: Microwave: X-band, 9.6 GHz, with choice of 5 polarisation modes (VV, HH, HV, VH, HH/HV + VV/VH) Spatial resolution: Single polarisation modes; Spotlight: 1 m. Stripmap: 3 - 15 m, ScanSAR: 30 or 100 m. Two polarisation mode (PING-PONG): 15 m. Swath width: Single polarisation modes: Spotlight: 10 km. Stripmap; 40 km. ScanSAR: 100 or 200 m - Two polarisation mode (PING-PONG): 30 km. Accuracy:
SAR components testing CONAE	SARE-1B	TBD	TBD		Waveband: Spatial resolution: Swath width: Accuracy:
SAR-2000 S.G. SAR-2000 Second Generation ASI (MiD (Italy))	CSG-1, CSG-2	Approved	Imaging microwave radars	All-weather images of ocean, land and ice for monitoring of land surface processes, ice, environmental monitoring, risk management, environmental resources, maritime management, Earth topographic mapping.	Waveband: Microwave: X-band (9.6 GHz) single-, dual- and quad- polarization Spatial resolution: Dual polarisation modes: Spotlight: 1 m, Stripmap: 3 m, ScanSAR: 20 or 40 m. Quad polarisations mode: Ping-Pong: 15 m. Swath width: Dual polarisation modes: Spotlight: 10 km, Stripmap: 40 km, ScanSAR: 100 or 200 km. Quad polarisation modes: Ping-Pong: 30 km. Accuracy: -
SAR-L L-Band Synthetic Aperture Radar CONAE	SAOCOM 1A, SAOCOM 1B, SAOCOM-2A, SAOCOM-2B	Being developed	Imaging microwave radars	Land, ocean, emergencies, soil moisture, interferometry, others.	Waveband: L-band (1.275 GHz) Spatial resolution: 10 x 10 m – 100 x 100 m Swath width: 20 – 350 km Accuracy: 0.5 dB
SAR-L Synthetic Aperture Radiometer (L band) ISRO	RISAT-3	Proposed	Imaging multi-spectral radiometers (passive microwave)	Studies related to soil moisture and ocean salinity.	Waveband: L Band Spatial resolution: 1.5 m, 2.5 m, 5 m, 20 m, 35 m Swath width: 10 - 120 km Accuracy:
SAR-X Synthetic Aperature Radiometer (RISAT-2) ISRO	RISAT-2	Operational	Imaging microwave radars	For disaster management applications.	Waveband: X Band (9.0 Ghz) Spatial resolution: 3 - 8 m Swath width: 10 km, 50 km Accuracy:
SBUV/2 Solar Backscattter Ultra-Violet Instrument/2 NOAA	NOAA-16, NOAA-17, NOAA-18, NOAA-19	Operational	Atmospheric chemistry	Data on trace gases including vertical profile ozone, and solar irradiance and total ozone concentration measurements.	Waveband: UV: 0.16 - 0.4 µm (12 channels) Spatial resolution: 170 km Swath width: Accuracy: Absolute accuracy: 1%
SCA EUMETSAT	EPS-SG-b	Proposed		Instrument TBC.	Waveband: Spatial resolution: Swath width: Accuracy:
ScaRaB Scanner for Earth's Radiation Budget CNES	MEGHA-TROPIQUES	Operational	Earth radiation budget radiometers	Measures top-of-atmosphere shortwave radiation (0.2 - 4.0 µm) and total radiation (0.2 - 50 µm). Two additional narrow-band channels (0.5 - 0.7 µm and 11 - 12 µm) allow cloud detection and scene identification.	Waveband: VIS window channel: 0.5 - 0.7 µm, Solar channel UV - SWIR: 0.2 - 4 µm, Total channel UV - FIR: 0.2 - 50 µm, Thermal window channel: 10.5 - 12.5 µm Spatial resolution: 40 km Swath width: 2200 km Accuracy: Absolute: ± 2.5 W/m2/sr, Relative: ± 0.7 W/m2/sr
SCAT Scatterometer CNES	CFOSAT	Approved			Waveband: Spatial resolution: Swath width: Accuracy:
Scatterometer (Meteor) Scatterometer ROSHYDROMET (ROSKOSMOS)	Meteor-M N3	Approved	Scatterometers	Ocean surface wind measurements.	Waveband: Ku-band Spatial resolution: 25 km Swath width: 1800 km Accuracy: Wind speed: 2 m/s, direction: 20 grad
Scatterometer (OCEANSAT) ISRO	OCEANSAT-2, Scatsat-1	Operational	Scatterometers	Ocean surface wind measurements.	Waveband: 13.515 GHz Spatial resolution: 50 km Swath width: 1400 - 1840 km Accuracy:
SDR Software Defined Radio NSC	AISSat-1, AISSat-2	Operational	Communications	Software Defined Radio (SDR) for reception of VHF AIS (Automatic Identification System).	Waveband: VHF Spatial resolution: Swath width: Accuracy: Modelling shows that the instrument should detect more than 95% of the vessels carrying AIS within the satellite's field of view in the High North each orbit.

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
SeaWinds NASA	QuikSCAT	Operational	Scatterometers	Measurement of surface wind speed and direction. The SeaWinds antenna on QuikSCAT stopped rotating in November 2009, and the instrument no longer collects ocean wind vector data. However it still provides calibration data for other on-orbit scatterometers, which enables the continuation of a climate-quality wind vector dataset.	Waveband: Microwave: 13.402 GHz Spatial resolution: 25 km Swath width: 1600 km Accuracy: Speed: 2 - 3.5 m/s Direction: 20 deg
SEISS Space Environment In Situ Suite NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Space environment	Monitor proton, electron, and alpha particle fluxes.	Waveband: 30 eV - 500 MeV Spatial resolution: 15 deg, 30 deg, 60 deg, 90 deg Swath width: Accuracy: 25%
SEM Space Environment Monitor NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B	Operational	Space environment	Measures space environment parameters to support space craft operations.	Waveband: Spatial resolution: Swath width: Accuracy:
SEM (GOES) Space Environment Monitor NOAA	GOES-12, GOES-13, GOES-14, GOES-15	Operational	Space environment	Used for equipment failure analysis, solar flux measurement, solar storm warning, and magnetic and electric field measurement at satellite.	Waveband: Spatial resolution: Swath width: Accuracy:
SEM (POES) Space Environment Monitor NOAA	Metop-A, Metop-B, Metop-C, NOAA-16, NOAA-17, NOAA-18, NOAA-19	Operational	Space environment	Used for equipment failure analysis, solar flux measurement, solar storm warning, and magnetic and electric field measurement at satellite.	Waveband: Senses and quantifies intensity in the sequentially selected energy bands, with energies ranging from 0.05 - 20 keV. Senses protons, electrons, and ions with energies from 30 keV to levels exceeding 6.9 MeV Spatial resolution: Swath width: Accuracy:
SES Space Environment Suite, improved SEM CAST (NSMC-CMA)	FY-3C, FY-3D, FY-3E, FY-3F	Prototype	Space environment	Measures space environment parameters to support space craft operations.	Waveband: Spatial resolution: Swath width: Accuracy:
Severjanin X-band Synthetic Aperture Radar ROSHYDROMET	Meteor-M N1, Meteor-M N2, Meteor-M N2-1, Meteor-M N2-2	Operational	Imaging microwave radars		Waveband: X-band Spatial resolution: 500 m and 1000 m Swath width: Accuracy:
SEVIRI Spinning Enhanced Visible and Infra-Red Imager EUMETSAT (ESA)	Meteosat-10, Meteosat-11, Meteosat-8, Meteosat-9	Operational	Imaging multi-spectral radiometers (vis/IR)	Measurements of cloud cover, cloud top height, precipitation, cloud motion, vegetation, radiation fluxes, convection, air mass analysis, cirrus cloud discrimination, tropopause monitoring, stability monitoring, total ozone and sea surface temperature.	Waveband: VIS0.6=0.5975 - 0.6725 µm, VIS0.8=0.775 - 0.845 µm, NIR1.6=1.57 - 1.71 µm, IR3.9=3.7 - 4.14 µm, WV6.3=5.8 - 6.7 µm, WV7.3=7.1 - 7.6 µm, IR8.7=8.5 - 8.9 µm, IR9.7=9.52 - 9.8 µm, IR10.8=10.3 - 11.3 µm, IR12.0=11.5 - 12.5 µm, IR13.4=12.9 - 13.9 µm, HRV=~0.48 - 0.91 µm ,unfiltered Si (measured at FWHM) Spatial resolution: HRV=1 km, All other channels=3 km (spatial sampling distance at SSP) Swath width: 9 km swath scanning E-W, moving up S-N a swath width at the end of each swath. Full Disc Coverage (FDC) or Local Area Coverage (LAC) possible. Accuracy: Cloud cover: 10%, Cloud top height: 1 km, Cloud top temperature: 1 K, Cloud type: 8 classes, Surface temperature: 0.7 - 2.0 K, Specific humidity profile: 10%, Wind profile (horizontal component): 2 - 10 m/s, Long wave Earth surface radiation: 5 W/m2
SGLI Second-generation Global Imager JAXA		Approved	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Medium resolution multi-spectral imaging of land, ocean and atmosphere.	Waveband: VIS - NIR: 0.38 - 0.865 µm, SW: 1.05 - 2.21 µm; TIR: 10.8 - 12.0 µm Spatial resolution: 250 m, 500 m, 1000 m Swath width: 1150 km (VNR), 1400 km (IRS) Accuracy:
SIM Solar Irradiation Monitor NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C, FY-3E	Operational	Earth radiation budget radiometers	Solar irradiance monitoring.	Waveband: 0.2 - 50 µm Spatial resolution: Swath width: Accuracy:
SIM Spectral Irradiance Monitor NASA	SORCE	Operational	Earth radiation budget radiometers	Measures solar spectral irradiance in the 200 - 2000 nm range.	Waveband: UV - SWIR: 200 - 2000 nm Spatial resolution: Swath width: Accuracy:
SIM-2 Solar Irradiation Monitor-2 NRSCC (NSMC-CMA, CAST)	FY-3C, FY-3E, FY-3G	Operational	Earth radiation budget radiometers	Solar irradiance monitoring.	Waveband: 0.2 - 50 µm Spatial resolution: Swath width: Accuracy:
SIRAL SAR Interferometer Radar Altimeter ESA	CryoSat-2	Operational	Radar altimeters	Marine ice and terrestrial ice sheet thickness measurement.	Waveband: Microwave: 13.575 GHz (Ku-Band) Spatial resolution: Range resolution 45 cm, along-track resolution 250 m Swath width: Footprint 15 km Accuracy: Arctic sea-ice: 1.6 cm/year for 300 km x 300 km cells, Land ice (small scale): 3.3 cm/year for 100 x 100 km cells, Land ice (large scale): 0.17 cm/year for Antarctica size area
SLIM-6-22 Surrey Linear Imager - 6 channel - 22m resolution UKSA	UK-DMC2	Operational	High resolution optical imagers	Visible and NIR imagery in support of disaster management - part of the Disaster Management constellation.	Waveband: VIS: 0.63 - 0.69 µm, 0.52 - 0.61 µm; NIR: 0.77 - 0.90 µm. Spatial resolution: 22 m Swath width: Two imaging banks each with a 330km swath. The two swaths overlap by 11km, providing a total swath up to 638km Accuracy: S/N 150:1 @ target albedo of 0.1.
SLSTR Sea and Land Surface Temperature Radiometer ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Imaging multi-spectral radiometers (vis/IR)	Marine and land services.	Waveband: 9 bands in VNIR/SWIR/TIR Spatial resolution: 500 m (VNIR/SWIR), 1 km (TIR) Swath width: 1675 km (near-nadir view), 750km (backward view) Accuracy: 0.2 K abs., 80 mK rel.
SMR Submillimetre Radiometer SNSB	Odin	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	Measures global distributions of ozone and species of importance for ozone chemistry ClO, HNO3, H2O, N2O, (HO2, H2O2). Measures temperature in the height range 15 - 100 km.	Waveband: Microwave: 118.7 GHz + 4 bands in the region 480 - 580 GHz: Tuneable measures 2 - 3 x 1 GHz regions at a time; ~0.1 cm - ~0.3 cm Spatial resolution: Vertical resolution 1.5 - 3 km, along track 600 km Swath width: Altitudes of 5 - 100 km Accuracy: 2 - 40% depending on species and altitude
SODAD/CARMEN-1 Orbital System for an Active Detection of Debris CNES (CONAE)	SAC-D/Aquarius	Operational	Space environment	Space debris studies.	Waveband: Spatial resolution: Swath width: Accuracy:
SODISM SOlar Diameter Imager and Surface Mapper CNES	PICARD	Operational	Earth radiation budget radiometers	Measures diameter and differential rotation of the sun - a whole Sun imager.	Waveband: UV: 230 nm, VIS: 548 nm, Active regions: 160 nm plus Lyman alpha detector Spatial resolution: Swath width: Accuracy:
SOLSTICE SOLar STellar Irradiance Comparison Experiment NASA	SORCE	Operational	Earth radiation budget radiometers	Data on UV and charged particle energy inputs, and on time variation of full-disk solar UV spectrum. Measures solar UV radiation (115 - 430 nm) with resolution of 0.12 nm. Compares solar UV output with UV radiation of stable bright blue stars.	Waveband: UV: 115 - 180 nm and 170 - 320 nm Spatial resolution: Swath width: Accuracy: 1%
Sounder NOAA	GOES-12, GOES-13, GOES-14, GOES-15	Operational	Atmospheric temperature and humidity sounders	Atmospheric soundings and data on atmospheric stability and thermal gradient winds.	Waveband: VIS - TIR: 19 channels Spatial resolution: 10 km Swath width: Horizon to horizon Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
Sounder (INSAT) IR Sounder ISRO	INSAT-3D, INSAT-3DR, INSAT-3DS	Being developed	Atmospheric temperature and humidity sounders	Atmospheric soundings, atmospheric stability, thermal gradient winds.	Waveband: SWIR: 3.74 - 4.74 µm; MWIR: 6.51 - 11.03 µm; TIR: 12.02 - 14.71 µm; VIS: 0.55 - 0.75 µm Spatial resolution: 10 x 10 km Swath width: Full (Full Earth disc sounding), Program (Options provided for for Sector Scans) Accuracy:
SOVAP SOlar Variability Picard radiometer CNES	PICARD	Operational	Earth radiation budget radiometers	Total solar irradiance measurements.	Waveband: Total irradiance Spatial resolution: Swath width: Accuracy:
Spectrometer (OCO-2) NASA	OCO-2	Being developed	Atmospheric chemistry	Global measurements of atmospheric CO2 needed to describe the variability of CO2 sources and sinks.	Waveband: 0.76 µm, 1.61 µm, 2.06 µm Spatial resolution: Swath width: Accuracy:
SRAL SAR Radar Altimeter ESA (EC)	Sentinel-3 A, Sentinel-3 B, Sentinel-3 C	Approved	Radar altimeters	Marine and land services.	Waveband: Dual freq radar altimeter, Ku-band, C-band Spatial resolution: 300 m Swath width: Profiling Accuracy: 3 cm in range (1 s average, 2 m SWH including atm. corrections)
SSB/X-2 Special Sensor Gamma Ray Particle Detector NOAA (DoD (USA))	DMSP F-14	Operational	Space environment	Detects the location, intensity, and spectrum of X-rays emitted from the Earth's atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSI/ES-2 Special Sensor Ionospheric Plasma Drift/Scintillation Meter NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Space environment	Measurement of the ambient electron density and temperatures, the ambient ion density, and ion temperature and molecular weight.	Waveband: Spatial resolution: Swath width: Accuracy:
SSI/ES-3 Special Sensor Ionospheric Plasma Drift/Scintillation Meter NOAA (DoD (USA))	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Measurement of the ambient electron density and temperatures, the ambient ion density, and ion temperature and molecular weight.	Waveband: Spatial resolution: Swath width: Accuracy:
SSJ/4 Special Sensor Precipitating Plasma Monitor NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Magnetic field	Measurement of transfer energy, mass, and momentum of charged particles through the magnetosphere-ionosphere in the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
SSJ/5 Special Sensor Precipitating Plasma Monitor NOAA (DoD (USA))	DMSP F-16	Operational	Magnetic field	Measurement of transfer energy, mass, and momentum of charged particles through the magnetosphere-ionosphere in the Earth's magnetic field.	Waveband: Spatial resolution: Swath width: Accuracy:
SSM Special Sensor Magnetometer NOAA (DoD (USA))	DMSP F-14, DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Magnetic field	Measures geomagnetic fluctuations associated with solar geophysical phenomena. With SSIES and SSJ provides heating and electron density profiles in the ionosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSM/I Special Sensor Microwave Imager NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Imaging multi-spectral radiometers (passive microwave)	Measures atmospheric, ocean and terrain microwave brightness temperatures to provide: sea surface winds, rain rates, cloud water, precipitation, soil moisture, ice edge, ice age.	Waveband: Microwave: 19.35 GHz, 22.235 GHz, 37 GHz, 85 GHz Spatial resolution: 15.7 x 13.9 km to 68.9 x 44.3 km (depends on frequency) Swath width: 1400 km Accuracy:
SSM/IS Special Sensor Microwave Imager Sounder NOAA (DoD (USA))	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Atmospheric temperature and humidity sounders	Measures thermal microwave radiation. Global measurements of air temp profile, humidity profile, ocean surface winds, rain overland/ocean, ice concentration/age, ice/snow edge, water vapour/clouds over ocean, snow water content, land surface temperature.	Waveband: Microwave: 19 - 183 GHz (24 frequencies) Spatial resolution: Varies with frequency: 25 x 17 km to 70 x 42 km Swath width: 1700 km Accuracy:
SSM/T-1 Special Sensor Microwave Temperature Sounder NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Atmospheric temperature and humidity sounders	Measures Earth's surface and atmospheric emission in the 50 - 60 GHz oxygen band.	Waveband: Microwave: 7 channels in the 50 - 60 GHz range Spatial resolution: 174 km diameter beam Swath width: 1500 km Accuracy:
SSM/T-2 Special Sensor Microwave Water Vapor Sounder NOAA (DoD (USA))	DMSP F-14, DMSP F-15	Operational	Atmospheric temperature and humidity sounders	Water vapour profiler.	Waveband: Microwave: 91.6, 150, 183.31 (3 channels) (Total 5 channels) Spatial resolution: Approx 48 km Swath width: 1500 km Accuracy:
SSTI Satellite-to-Satellite Tracking Instrument ESA	GOCE	Operational	Precision orbit	Measurements of low-frequency (coarse-scale) gravity field variations as well as highly precise positioning on GOCE.	Waveband: Spatial resolution: Swath width: Accuracy:
SSULI Special Sensor Ultraviolet Limb Imager NOAA	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Measures vertical profiles of the natural airglow radiation from atoms, molecules and ions in the upper atmosphere and ionosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SSUSI Special Sensor Ultraviolet Spectrographic Imager NOAA	DMSP F-16, DMSP F-17, DMSP F-18, DMSP F-19, DMSP F-20	Operational	Space environment	Monitors the composition and structure of the upper atmosphere and ionosphere, as well as auroral energetic particle inputs, with spectrographic imaging and photometry.	Waveband: Spatial resolution: Swath width: Accuracy:
STR Star Tracker Set (3) ESA	Swarm	Being developed	Precision orbit	Precise attitude determination from the combination of two or three star trackers.	Waveband: N/A Spatial resolution: <1 arcsec Swath width: N/A Accuracy: < 3 arcsec pointing accuracy around all STR axes
SUVI Solar Ultraviolet Imager NOAA	GOES-R, GOES-S, GOES-T, GOES-U	Being developed	Other	The SUVI will monitor the entire dynamic range of solar x-ray features, including coronal holes and solar flares, and will provide quantitative estimates of the physical conditions in the Sun's atmosphere.	Waveband: Spatial resolution: Swath width: Accuracy:
SWIM Surface Waves Investigation and Monitoring CNES	CFOSAT	Approved			Waveband: Spatial resolution: Swath width: Accuracy:
SXI Solar X-ray Imager NOAA (USAF)	GOES-12, GOES-13, GOES-15	Operational	Space environment	Obtains data on structure of solar corona. Full disk imagery also provides warnings of geomagnetic storms, solar flares, and information on active regions of sun and filaments.	Waveband: Spatial resolution: Swath width: Accuracy:
TANSO-CAI Thermal And Near infrared Sensor for carbon Observation - Cloud and Aerosol Imager JAXA (MOE (Japan), NIES (Japan))	GOSAT	Operational	Imaging multi-spectral radiometers (vis/IR)	Detection and correction of cloud and aerosol for TANSO-FTS.	Waveband: 0.380 µm, 0.674 µm, 0.870 µm, 1.60 µm Spatial resolution: 0.5 km (0.380, 0.674, 0.870 µm bands), 1.5 km (1.62 µm band) Swath width: 1000 km (0.380 µm, 0.678 µm, 0.870 µm bands), 750 km (1.62 µm band) Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
TANSO-CAI-2 Thermal And Near infrared Sensor for carbon Observation - Cloud and Aerosol Imager-2 JAXA (MOE (Japan), NIES (Japan))	GOSAT-2	Proposed	Imaging multi-spectral radiometers (vis/IR)	Detection and correction of cloud and aerosol for TANSO-FTS, NO2, aerosol characteristics	Waveband: 0.380-0.450 µm, 0.674 µm, 0.870 µm Spatial resolution: 1 km (0.380-0.450 (1 nm step imaging spectrometer), 0.674, 0.870 µm bands) Swath width: 1000 km (Imaging Spectrometer Capability) Accuracy:
TANSO-FTS Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer JAXA (MOE (Japan), NIES (Japan))	GOSAT	Operational	Atmospheric temperature and humidity sounders and atmospheric chemistry	CO2 and CH4 distribution.	Waveband: 0.758 - 0.775 µm, 1.56 - 1.72 µm, 1.92 - 2.08 µm, 5.56 - 14.3 µm Spatial resolution: 10.5 km Swath width: 160 km Accuracy:
TANSO-FTS-2 Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer-2 JAXA (MOE (Japan), NIES (Japan))	GOSAT-2	Proposed	Atmospheric temperature and humidity sounders	CO2, CH4, and CO distribution.	Waveband: 0.758 - 0.775 µm, 1.56 - 1.72 µm, 1.92 - 2.08 µm, 2.30-2.38 µm, 5.56 - 14.3 µm Spatial resolution: smaller than 10.5km Swath width: Accuracy:
TDP Technological Development Package CONAE	SAC-D/Aquarius	Operational	Precision orbit	Develop, test, and operate the Technological Demonstration Package (TDP) for demonstrating a newly developed GPS receiver for position, velocity, and time determination and an Inertia Reference Unit (IRU) to measure inertial angular velocity.	Waveband: Spatial resolution: Swath width: Accuracy:
TES Tropospheric Emission Spectrometer NASA	Aura	Operational	Atmospheric chemistry	3D profiles on a global scale of all infra-red active species from surface to lower stratosphere. Measures greenhouse gas concentrations, tropospheric ozone, acid rain precursors, gas exchange leading to stratospheric ozone depletion.	Waveband: SWIR-TIR: 3.2 - 15.4 µm Spatial resolution: In limb mode: 2.3 km vertical resolution. In down-looking mode: 50 x 5 km (global), 5 x 0.5 km (local) Swath width: Limb mode: global: 50 x 180 km, local: 5 x 18 km Accuracy: Ozone: 20 ppb, Trace gases: 3 - 500 ppb
TGSP Trace Gas Spectrometer ROSHYDROMET (ROSKOSMOS)	Meteor-MP N1, Meteor-MP N2, Meteor-MP N3	Proposed	Atmospheric chemistry	Trace gas measurements.	Waveband: Spatial resolution: Swath width: Accuracy:
TIM Total Irradiance Monitor NASA	SORCE, TCTE	Operational	Earth radiation budget radiometers	Measurement of total solar irradiance directly traceable to SI units with an absolute accuracy of 0.03% and relative accuracy of 0.001% per year.	Waveband: Spatial resolution: Swath width: Looks at the sun every orbit, providing 15 measurements per day Accuracy:
TIR (Oceansat-3/3A) Thermal Infrared Radiometer (Oceansat-3/3A) ISRO	OCEANSAT-3, OCEANSAT-3A	Being developed	Imaging multi-spectral radiometers (vis/IR)	TIR and OCM combination will support joint analysis for operational potential fishing zones.	Waveband: 5 bands Spatial resolution: 1 km Swath width: 1500 km Accuracy:
TIRS Thermal Infrared Sensor NASA (USGS)	LDCM	Being developed	Imaging multi-spectral radiometers (vis/IR)	Measures surface radiance and emittance, lands cover state and change (eg vegetation type). Used as multipurpose imagery for land applications.	Waveband: TIR 10.5 µm and 12 µm Spatial resolution: 100 m Swath width: 185 km Accuracy:
TMI TRMM Microwave Imager NASA	TRMM	Operational	Imaging multi-spectral radiometers (passive microwave)	Measures rainfall rates over oceans (less reliable over land), combined rainfall structure and surface rainfall rates with associated latent heating. Used to produce monthly total rainfall maps over oceans.	Waveband: Microwave: 10.7 GHz, 19.4 GHz, 21.3 GHz, 37 GHz, and 85.5 GHz Spatial resolution: Vertical: 2.5 km approx; Horizontal: 18 km Swath width: 790 km Accuracy: Liquid water: 3 mg/cm3, Humidity: 3 mg/cm3, Ocean wind speed: 1.5 m/s
TOU/SBUS Total Ozone Unit & Solar Backscatter Ultraviolet Sounder NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Atmospheric temperature and humidity sounders	Ozone total column vertical profile measurements.	Waveband: TOU: 6 channels in the range 308 - 360 nm, SBUS: in the range 252 - 340 nm Spatial resolution: TOU: 50 km total ozone, SBUS: 200 km total ozone Swath width: TOU: 3000 km, SBUS: nadir only Accuracy: 50km
TRSR Turbo-Rogue Space Receiver NASA	Jason-1	Operational	Atmospheric temperature and humidity sounders and precision orbit	Precise continuous tracking data of satellite to decimetre accuracy.	Waveband: Spatial resolution: Swath width: Accuracy:
TSIS Total Solar and Spectral Irradiance Sensor NOAA	Free Flyer-1, Free Flyer-2, JPSS-2	Being developed	Earth radiation budget radiometers	0.2 - 2 µm solar spectral irradiance monitor.	Waveband: UV - SWIR: 0.2 - 2 µm Spatial resolution: Swath width: Accuracy: 1.5 w/m2
TSU Temperature Sounding Unit ISRO	Scatsat-1	Proposed	Atmospheric temperature and humidity sounders	Atmospheric soundings, atmospheric stability, thermal gradient winds.	Waveband: 17 Channel , 1 channel each in 23.8 and 31.5 GHz and 15 channels in 50 - 60 GHz Spatial resolution: 40 - 96 km Swath width: 1550 km Accuracy:
UV Spectrometer (GACM) NASA	GACM	Proposed	Atmospheric chemistry	Daytime measurements of O3, NO2, SO2, CH2O, and aerosols.	Waveband: 305 - 320 nm and 500 - 650 nm Spatial resolution: Swath width: Accuracy:
UVAS UVAS (Ultraviolet Visible and near-infrared Atmospheric Sounder) CDTI	Ingenio	Being developed	Atmospheric chemistry	High spatial resolution observations of air quality and climate gases such as ozone (O3), nitrogen dioxide (NO2), sulphur dioxide (SO2), formaldehyde (HCHO) glyoxal (CHO-CHO), and aerosols over selected zones of interest (urban and industrialized areas, mayor motorways, and special events like forest fires, volcano eruption and sand storms). Also measurements of halogenated compounds will be performed, including bromine monoxide (BrO) and iodine monoxide (IO).	Waveband: UV/VIS 290 - 490 nm Spatial resolution: 20 km nominal, 10 km zoom. Swath width: Accuracy: trace gas profile 10 - 40%
UVN UV-VIS-NIR Sounder EUMETSAT (ESA)	MTG-S1 (sounding), MTG-S2 (sounding)	Approved	Atmospheric chemistry	Measurements of atmospheric trace gases, mainly O3, NO2, SO2, H2CO. The product list is not yet approved, the accuracy summary column lists the breakthrough user requirements.	Waveband: UV-1: 290 - 308 nm, UV-2: 308 - 400 nm, VIS: 400 - 500 nm, NIR: 750 - 775 nm Spatial resolution: < 5 km at SSP, possibly relaxed to 50 km for wavelengths < 308 nm Swath width: FOV E-W: 30°W-45°E @ 40°N, N-S: 30°N-65°N Accuracy: H2CO: 50%, NO2: 50%, O3: 10%, SO2: 50%
UVN (Sentinel-4) UV-visible- near infrared imaging spectrometer (Sentinel-4) ESA (EC)	Sentinel-4 A, Sentinel-4 B	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 290 - 308 nm, UV-2: 308 - 400 nm, VIS: 400 - 500 nm, NIR: 750 - 775 nm Spatial resolution: < 5 km at SSP, possibly relaxed to 50 km for wavelengths < 308 nm Swath width: FOV E-W: 30°W-45°E @ 40°N, N-S: 30°N-65°N Accuracy: TBD
UVNS (Sentinel-5 precursor) Ultra-violet Visible Near-infrared Shortwave-infrared spectrometer ESA (EC, NSO)	Sentinel-5 precursor	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 270 - 300 nm, UV-2: 300 - 400 nm, VIS: 400 - 500 nm, NIR: 710 - 775 nm, SWIR-3: 2305 - 2385 nm Spatial resolution: 5 - 15 km at SSP, possibly relaxed to 50 km for wavelengths < 300 nm Swath width: Daily global coverage Accuracy: TBD
UVNS (Sentinel-5) Ultra-violet Visible Near-infrared Shortwave-infrared spectrometer ESA (EC)	Sentinel-5	Proposed	Atmospheric chemistry	Supporting atmospheric composition and air quality monitoring services.	Waveband: UV-1: 270 - 300 nm, UV-2: 300 - 400 nm, VIS: 400 - 500 nm, NIR: 710 - 775 nm, SWIR-1: 1593 - 1672 nm, SWIR-2: 1940 - 2030 nm, SWIR-3: 2305 - 2385 nm Spatial resolution: 5 - 15 km at SSP, possibly relaxed to 50 km for wavelengths < 300 nm Swath width: Daily global coverage Accuracy: TBD
VEGETATION CNES (SNSB, EC)	SPOT-4, SPOT-5	Operational	Imaging multi-spectral radiometers (vis/IR)	Data of use for crop forecast and monitoring, vegetation monitoring, and biosphere/ geosphere interaction studies.	Waveband: Operational mode: VIS: 0.61 - 0.68 µm, NIR: 0.78 - 0.89 µm, SWIR: 1.58 - 1.75 µm, Experimental mode: VIS: 0.43 - 0.47 µm Spatial resolution: 1.15 km at nadir - minimal variation for off-nadir viewing Swath width: 2200 km Accuracy:

Instrument & agency (& any partners)	Missions	Status	Type	Measurements & applications	Technical characteristics
VFM Vector Field Magnetometer ESA	Swarm	Being developed	Magnetic field	Magnetic field vector measurements.	Waveband: N/A Spatial resolution: <0.1nT Swath width: N/A Accuracy: <0.5 nT/15 days
VHRR Very High Resolution Radiometer ISRO	INSAT-3A, KALPANA-1	Operational	Imaging multi-spectral radiometers (vis/IR)	Cloud cover, rainfall, wind velocity, sea surface temperature, outgoing longwave radiation, reflected solar radiation in spectral band 0.55 - 0.75 µm, emitted radiation in 10.5 - 12.5 µm range.	Waveband: VIS: 0.55 - 0.75 µm, NIR: 5.7 - 7.1 µm, TIR: 10.5 - 12.5 µm Spatial resolution: 2 km in visible, 8 km in IR Swath width: Full Earth disk every 30 minutes Accuracy:
VIIRS Visible/Infrared Imager Radiometer Suite NOAA (NASA)	DWSS, JPSS-1, JPSS-2, Suomi NPP	Operational	Imaging multi-spectral radiometers (vis/IR) and ocean colour instruments	Global observations of land, ocean, and atmosphere parameters: cloud/weather imagery, sea-surface temperature, ocean colour, land surface vegetation indices.	Waveband: VIS - TIR: 0.4 - 12.5 µm (22 channels) Spatial resolution: 400 m - 1.6 km Swath width: 3000 km Accuracy: SST 0.35 K
VIRR Multispectral Visible and Infra-red Scan Radiometer (10 channels) NRSCC (NSMC-CMA, CAST)	FY-3A, FY-3B, FY-3C	Operational	Imaging multi-spectral radiometers (vis/IR)	Multispectral Visible and Infra-red Scan Radiometer.	Waveband: Instrument features 10 channels over 0.43 - 10.5 µm Spatial resolution: 1.1 km at nadir Swath width: 2800 km Accuracy: 1.1 km
VIRS Visible Infra-red Scanner NASA	TRMM	Operational	Imaging multi-spectral radiometers (vis/IR)	Data to be used in conjunction with data from CERES instrument to determine cloud radiation. Will enable 'calibration' of precipitation indices derived from other satellite sources.	Waveband: VIS: 0.63 µm, SWIR - MWIR: 1.6 µm and 3.75 µm, TIR: 10.8 µm and 12 µm Spatial resolution: 2 km at nadir Swath width: 720 km Accuracy:
Visible imaging spectrometer (HysplRI) NASA	HysplRI	Proposed	Hyperspectral imagers and imaging multi-spectral radiometers (vis/ir)		Waveband: 400 - 2500 nm Spatial resolution: 60 m at nadir; 3 week revisit time Swath width: 90 km Accuracy: Spectral accuracy < .5 nm
VSC Venus Superspectral Camera CNES (ISA)	VENUS	Being developed	Imaging multi-spectral radiometers (vis/IR)	High resolution superspectral images (12 spectral bands) for vegetation and landcover applications.	Waveband: 420 nm centre wavelength (width: 40 nm); 443 nm (40); 490 nm (40); 555 nm (40); 620 nm (40); 620 nm (40); 667 nm (30); 702 nm (24); 742 nm (16); 782 nm (16); 865 nm (40); 910 nm (20) Spatial resolution: 5.3 m spatial resolution with 27 km swath Swath width: 27 km Accuracy:
WEFAX Weather Facsimile NOAA	GOES-12	Operational	Communications	Weather facsimile.	Waveband: Spatial resolution: Swath width: Accuracy:
WFC Wide Field Camera NASA	CALIPSO	Operational	Imaging multi-spectral radiometers (vis/IR)	Acquires high spatial resolution imagery for meteorological context.	Waveband: VIS: 620 to 670 nm Spatial resolution: 125 m Swath width: 61 km Accuracy:
WFI-2 Wide Field Imager-2 INPE (CAST)	CBERS-3, CBERS-4	Being developed	Imaging multi-spectral radiometers (vis/IR)	Earth resources, environmental monitoring, land use.	Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm; 0.77 - 0.89 µm Spatial resolution: 64 m Nadir Swath width: 866 km Accuracy:
WindRAD Wind Radar NSMC-CMA	FY-3E, FY-3G	Prototype	Scatterometers	Measures sea-surface wind.	Waveband: C and Ku band. Spatial resolution: Swath width: Accuracy:
WS LISS III Wide Scan LISS III ISRO	RESOURCESAT-3, RESOURCESAT-3A	Proposed	Imaging multi-spectral radiometers (vis/IR)	For crops and vegetation dynamics, natural resources census, disaster management and large scale mapping of themes.	Waveband: 3 bands in VNIR and 1 band in SWIR Spatial resolution: 23.5 m, 10 m Swath width: 700 km Accuracy:
WSAR NSOAS (CAST)	HY-3A, HY-3B, HY-3C	Proposed	Imaging microwave radars	High resolution radar measurements of land and ocean features.	Waveband: X-Band: 8 - 12 GHz Spatial resolution: 3 modes: 1 m, 5 m, 10 m Swath width: 3 swaths: 40 km, 80 km, 150 km Accuracy:
WTE Whale Tracker Experiment CONAE	SAC-C	Operational	Data collection	Tracking of Eubalean Australis and environmental data collection system.	Waveband: Spatial resolution: Swath width: Accuracy:
X-Band SAR X-Band Synthetic Aperture Radar DLR	TanDEM-X, TerraSAR-X, TSX-NG	Operational	Imaging microwave radars	High resolution images for monitoring of land surface and coastal processes and for agricultural, geological and hydrological applications.	Waveband: 9.65 GHz, 300 MHz bandwidth, all 4 polarisation modes Spatial resolution: Spotlight: 1.2 x 1 - 4 m Stripmap: 3 x 3 - 6 m ScanSAR: 16 x 16 m Swath width: Spotlight: 5-10km x 10 km, Stripmap: 30 km, ScanSAR: 100 km Accuracy:
XPS XUV Photometer System NASA	SORCE	Operational	Other	Objective is to measure the extreme UV solar irradiance from 1 - 35 nm.	Waveband: UV: 1 - 35 nm Spatial resolution: Swath width: Accuracy: