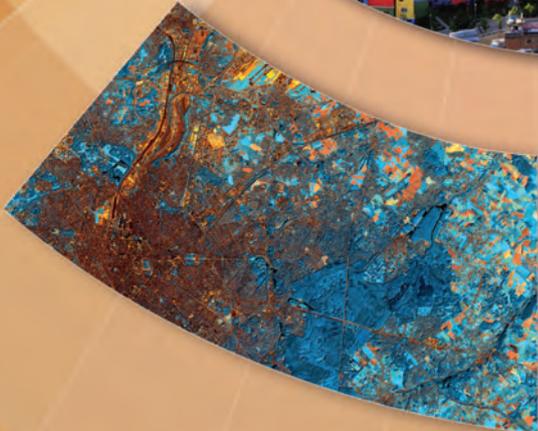
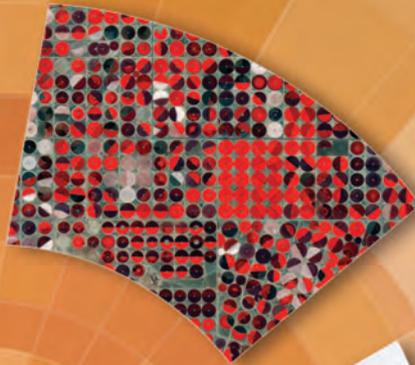


THE EARTH OBSERVATION HANDBOOK

2023 | Key Tables



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 overview 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.eobandbook.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 2022 survey of CEOS space agencies is complete as of November 2022, and the database has been updated with the results. The database now features details of 380 Earth observing satellite missions and 924 instruments (468 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 also features details on historical missions with data archives that provide important references for current and future applications - dating back at least 10 years, and longer in some cases. 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 2022 database contents. It is hoped that this document will provide a solution of value to those many users who welcome having a bookshelf reference to hand.

The contents are as follows:

1. Table of recent launches
2. Table of upcoming launches
3. A-Z table of satellite missions
4. A-Z table of satellite instruments

Recent & upcoming launches

14 missions were launched by CEOS agencies in 2022, until mid-November.

| Mission | Agency | Launch |
|--|------------------------|----------|
| MDASat-1a | SANSA / CPUT | Jan 2022 |
| MDASat-1b | SANSA / CPUT | Jan 2022 |
| MDASat-1c | SANSA / CPUT | Jan 2022 |
| Sich 2-30 | NSAU | Jan 2022 |
| CSG-2 (COSMO-SkyMed Second Generation - 2) | ASI / MoD (Italy) | Jan 2022 |
| RISAT-1A (Radar Imaging Satellite) | ISRO | Feb 2022 |
| GOES-18 (Geostationary Operational Environmental Satellite - 18) | NOAA / NASA | Mar 2022 |
| EnMAP (Environmental Mapping & Analysis Program) | DLR | Apr 2022 |
| LARES-2 (LAsER RElativity Satellite 2) | ASI | Jul 2022 |
| EMIT-on-ISS (International Space Station/Earth Surface Mineral Dust Source Investigation (EMIT)) | NASA | Jul 2022 |
| Goumang | CAST | Aug 2022 |
| Yunhai-1 03 | CAST | Sep 2022 |
| CDARS | NOAA / USAF | Oct 2022 |
| JPSS-2 (Joint Polar Satellite System - 2) | NOAA / EUMETSAT / NASA | Nov 2022 |

No fewer than 51 missions are planned for launch from mid-November 2022 through the end of 2023.

| Mission | Agency | Launch |
|---|--------------------------|----------|
| OCEANSAT-3 (Ocean Satellite-3) | ISRO | Nov 2022 |
| MTG-1 (Imaging) (Meteosat Third Generation - Imaging Satellite 1) | EUMETSAT / ESA | Nov 2022 |
| Kondor-FKA N1 (SAR Satellite Kondor-FKA N1) | ROSKOSMOS | Dec 2022 |
| SWOT (Surface Water Ocean Topography) | NASA / UKSA / CNES / CSA | Dec 2022 |
| HY-3A | NSOAS / CAST | Dec 2022 |
| HY-3B | NSOAS / CAST | Dec 2022 |
| HY-1E (Ocean color satellite E) | NSOAS / CAST | Dec 2022 |
| TROPICS (Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS)) | NASA | Dec 2022 |
| THEOS-2 Main VHR Satellite (Thailand Earth Observation System 2: Main VHR Satellite) | GISTDA | Dec 2022 |
| TEMPO (Tropospheric Emissions: Monitoring of Pollution) | NASA | Jan 2023 |
| NORSAT-TD (NorSat-Technology Demonstrator) | NOSA / NSO / ASI / CNES | Feb 2023 |
| LOTUSat 1 | VAST | Mar 2023 |
| THEOS-2 Small Satellite (Thailand Earth Observation System 2: Small Satellite) | GISTDA | Mar 2023 |
| Ionosphera-M N1 (Hydro-meteorological Satellite Ionosphera-M N1) | ROSKOSMOS / ROSHYDROMET | Mar 2023 |
| Ionosphera-M N2 (Hydro-meteorological Satellite Ionosphera-M N2) | ROSKOSMOS / ROSHYDROMET | Mar 2023 |
| ALOS-4 (Advanced Land Observing Satellite-4) | JAXA | Mar 2023 |
| ALOS-3 (Advanced Land Observing Satellite-3) | JAXA | Mar 2023 |
| Sentinel-1 C | ESA / COM | May 2023 |

| Mission | Agency | Launch |
|---|-------------------------|----------|
| Obzor-R N1 (SAR Operative Monitoring Satellite Obzor-R N1) | ROSKOSMOS | Jun 2023 |
| PREFIRE (Polar Radiant Energy in the Far InfraRed Experiment) | NASA | Aug 2023 |
| INSAT-3DS (Indian National Satellite - 3DS (Spare)) | ISRO | Sep 2023 |
| KOMPSTAT-7 (Korea Multi-Purpose Satellite -7) | KARI / KAI | Sep 2023 |
| EarthCARE | ESA / JAXA | Sep 2023 |
| NISAR (NASA ISRO Synthetic Aperture Radar) | NASA / ISRO | Sep 2023 |
| NORSAT-4 | NOSA / NDRE | Oct 2023 |
| RISAT-1B (Radar Imaging Satellite) | ISRO | Nov 2023 |
| GOES-U (Geostationary Operational Environmental Satellite - U) | NOAA / NASA | Nov 2023 |
| CO3D (Constellation Optique 3D) | CNES | Dec 2023 |
| CLARREO Pathfinder-on-ISS (International Space Station/Climate Absolute Radiance & Reflectivity Observatory Pathfinder) | NASA | Dec 2023 |
| Resurs-P N4 (Environmental Satellite Resurs-P N4) | ROSKOSMOS | Dec 2023 |
| Resurs-P N5 (Environmental Satellite Resurs-P N5) | ROSKOSMOS | Dec 2023 |
| FY-3RM-1 (FY-3 Rainfall Mission 1) | NSMC-CMA | Dec 2023 |
| Meteor-M N2-4 (Meteorological Satellite Meteor-M N2-4) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| Meteor-M N2-3 (Meteorological Satellite Meteor-M N2-3) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| MicroCarb | CNES / UKSA | Dec 2023 |
| HY-2H (Ocean dynamics satellite H) | NSOAS / CAST | Dec 2023 |
| HY-2E (Ocean dynamics satellite E) | NSOAS / CAST | Dec 2023 |
| Elektro-L N4 (Geostationary Operational Meteorological Satellite) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| Elektro-L N5 (Geostationary Operational Meteorological Satellite) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| Aist-2T N1 (Environmental Satellite Aist-2T N1) | ROSKOSMOS | Dec 2023 |
| Aist-2T N2 (Environmental Satellite Aist-2T N2) | ROSKOSMOS | Dec 2023 |
| Ionosphera-M N3 (Hydro-meteorological Satellite Ionosphera-M N3) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| Ionosphera-M N4 (Hydro-meteorological Satellite Ionosphera-M N4) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| KOMPSTAT-6 (Korea Multi-Purpose Satellite -6) | KARI | Dec 2023 |
| Biomass | ESA | Dec 2023 |
| Kondor-FKA N2 (SAR Satellite Kondor-FKA N2) | ROSKOSMOS | Dec 2023 |
| Resurs-PM N1 (Environmental Satellite Resurs-PM N1) | ROSKOSMOS | Dec 2023 |
| Arctica-M N2 (Hydro-meteorological Satellite Arctica-M N2) | ROSKOSMOS / ROSHYDROMET | Dec 2023 |
| FY-3F (FY-3F Polar-orbiting Meteorological Satellite) | NSMC-CMA / NRSCC | Dec 2023 |
| CAS500-4 (Compact Advanced Satellite 500 -4) | KAI / KARI | Dec 2023 |
| CAS500-2 (Compact Advanced Satellite 500 -2) | KAI / NGII / KARI | Dec 2023 |

A-Z table of satellite missions

CEOS agencies are operating or planning 339 individual satellite Earth observation missions in the 2023 - 2039 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 |
|--|------------------------|-------------|-------------|---|---|--|
| <p>Aeolus</p> <p>Atmospheric Dynamics Mission (Earth Explorer Core Mission)</p> <p>ESA</p> | Operational (nominal) | 22 Aug 2018 | 31 Dec 2022 | 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: 320 km Period: 02.5 min Inclination: 97.01 deg Repeat cycle: 7 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/export/esaLP/aeolus.html |
| <p>AISSat-2</p> <p>Automatic Identification System Satellite-2</p> <p>NOSA</p> | Operational (extended) | 08 Jul 2014 | 31 Dec 2022 | 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. | AIS | Type: Sun-synchronous Altitude: 626 km Period: 97 min Inclination: 98.4 deg Repeat cycle: LST: 5:30:00 Longitude (if geo): Asc/desc: Descending URL: |
| <p>Aist-2T N1</p> <p>Environmental Satellite Aist-2T N1</p> <p>ROSKOSMOS</p> | Planned | 31 Dec 2023 | 31 Dec 2028 | Earth resources, environmental and disaster monitoring, cartography. | | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| <p>Aist-2T N2</p> <p>Environmental Satellite Aist-2T N2</p> <p>ROSKOSMOS</p> | Planned | 31 Dec 2023 | 31 Dec 2028 | Earth resources, environmental and disaster monitoring, cartography. | | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| <p>ALOS-2</p> <p>Advanced Land Observing Satellite-2</p> <p>JAXA</p> | Operational (extended) | 24 May 2014 | 31 Dec 2023 | Environmental monitoring, disaster monitoring, civil planning, agriculture and forestry, Earth resources, land surface and ocean monitoring. | PALSAR-2 (ALOS-2), CIRC | Type: Sun-synchronous Altitude: 626 km Period: 97 min Inclination: 97.9 deg Repeat cycle: 14 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: https://global.jaxa.jp/projects/sat/alos2/index.html |
| <p>ALOS-3</p> <p>Advanced Land Observing Satellite-3</p> <p>JAXA</p> | Approved | 31 Mar 2023 | 31 Mar 2029 | Disaster monitoring, coastal and land environmental monitoring, the maintenance and updates of precise geospatial information. Mission instruments will be Optical Sensors (Pan, Mult). | | Type: Sun-synchronous Altitude: 668 km Period: 98 min Inclination: 98.1 deg Repeat cycle: 35 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://global.jaxa.jp/projects/sat/alos3/ |
| <p>ALOS-4</p> <p>Advanced Land Observing Satellite-4</p> <p>JAXA</p> | Approved | 31 Mar 2023 | 31 Mar 2030 | Environmental monitoring, disaster monitoring, civil planning, agriculture and forestry, Earth resources, land surface. | ALOS-4 SAR (L-band) | Type: Sun-synchronous Altitude: 626 km Period: 97 min Inclination: 97.9 deg Repeat cycle: 14 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: http://global.jaxa.jp/projects/sat/alos4/ |
| <p>ALTIUS</p> <p>Atmospheric Limb Tracker for Investigation of the Upcoming Stratosphere (ALTIUS)</p> <p>ESA</p> | Approved | 15 May 2025 | 15 May 2028 | Altius carries a high-resolution 2D imager that observes ozone from the side, at Earth's limb or atmospheric boundary. | ALTIUS Instrument | Type: Sun-synchronous Altitude: 668 km Period: Inclination: Repeat cycle: 3 days LST: Fixed between 10:00 – 14:00 Longitude (if geo): Asc/desc: URL: |
| <p>AMAZONIA-1</p> <p>Amazonia 1</p> <p>INPE</p> | Operational (nominal) | 28 Feb 2021 | 28 Feb 2025 | Earth resources, environmental monitoring, land surface. | WFI-2 (Amazonia-1) | Type: Sun-synchronous Altitude: 752 km Period: 99.9 min Inclination: 98.4 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.inpe.br/amazonia-1 |
| <p>Aqua</p> <p>Aqua (formerly EOS PM-1)</p> <p>NASA / JAXA / INPE</p> | Operational (extended) | 04 May 2002 | 30 Sep 2023 | 6-year nominal mission life, currently in extended operations. Atmospheric dynamics / water and energy cycles, cloud formation, precipitation and radiative properties, air / sea fluxes of energy and moisture, sea ice extent and heat exchange with the atmosphere. The HSB instrument failed on the 5th of February 2003. | AIRS, MODIS, CERES, HSB, AMSR-E, AMSU-A | Type: Sun-synchronous Altitude: 705 km Period: 98.6 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: https://eospo.nasa.gov/missions/aqua |
| <p>Arctica-M N1</p> <p>Hydro-meteorological Satellite Arctica-M N1</p> <p>ROSKOSMOS / ROSHYDROMET</p> | Operational (nominal) | 28 Feb 2021 | 28 Feb 2028 | Meteorology, oceanography, including ice cover monitoring, environmental climate and disaster monitoring in the Arctic region. | GGAK-VE, MSU-GS/VE | Type: Highly elliptical Altitude: Period: 720 min Inclination: 63.4 deg Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: Ascending URL: https://www.laspace.ru/projects/information-systems/arctica-n1 |
| <p>Arctica-M N2</p> <p>Hydro-meteorological Satellite Arctica-M N2</p> <p>ROSKOSMOS / ROSHYDROMET</p> | Planned | 31 Dec 2023 | 31 Dec 2033 | Meteorology, oceanography, including ice cover monitoring, environmental climate and disaster monitoring in the Arctic region. | GGAK-VE, MSU-GS/VE | Type: Highly elliptical Altitude: Period: 720 min Inclination: 63.4 deg Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: Ascending URL: https://www.laspace.ru/projects/information-systems/arctica-n1 |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|-----------------------------------|---|
| Aura Aura (formerly EOS Chemistry) NASA / NSO / FMI / NIVR / UKSA | Operational (extended) | 15 Jul 2004 | 30 Sep 2023 | 6-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 CloudSat for coincident observations of radiative fluxes and atmospheric state. | MLS (EOS-Aura), TES, HRDLS, OMI | Type: Sun-synchronous Altitude: 705 km Period: 98.8 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:38 Longitude (if geo): Asc/desc: Ascending URL: http://aura.gsfc.nasa.gov/ |
| Arctic Weather Satellite ESA | Approved | 31 Mar 2024 | 31 Mar 2029 | Provides high spatial resolution humidity and temperature soundings in all weather conditions. The AWS constellation would in addition provide high revisit and timely data. | MWR (AWS) | Type: Sun-synchronous Altitude: 595 km Period: 97 min Inclination: 97.79 deg Repeat cycle: 3 days LST: 10:00:00 Longitude (if geo): Asc/desc: Ascending URL: |
| Biomass ESA | Approved | 31 Dec 2023 | 30 Aug 2029 | Will provide global maps of forest biomass and height (at 200 m resolution) and forest disturbance (at 50 m resolution) every 6 months | P-Band SAR | Type: Sun-synchronous Altitude: 660 km Period: 102.6 min Inclination: 97.97 deg Repeat cycle: LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: |
| CALIPSO Cloud Aerosol Lidar and Infrared Pathfinder Satellite Observations NASA / CNES | Operational (extended) | 28 Apr 2006 | 30 Sep 2023 | 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 CloudSat for coincident observations of radiative fluxes and atmospheric state. | WFC, IIR, CALIOP | Type: Sun-synchronous Altitude: 685 km Period: 98.3 min Inclination: 98.2 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www-calipso.larc.nasa.gov/ |
| Capella X-SAR Capella X-band Synthetic Aperture Radar Capella | Operational (nominal) | 03 Dec 2018 | 31 Dec 2027 | The Capella X-SAR (Synthetic Aperture Radar) constellation will eventually consist of 36 microsatellites to provide global high resolution commercial SAR imagery | | Type: Sun-synchronous Altitude: 500 km Period: 90 min Inclination: 90 deg Repeat cycle: 0.25 days LST: Longitude (if geo): Asc/desc: URL: https://www.capellaspace.com/ |
| Capella X-SAR Capella X-band Synthetic Aperture Radar Capella | Operational (nominal) | 03 Dec 2018 | 31 Dec 2027 | The Capella X-SAR (Synthetic Aperture Radar) constellation will eventually consist of 36 microsatellites to provide global high resolution commercial SAR imagery | | Type: Sun-synchronous Altitude: 500 km Period: 90 min Inclination: 90 deg Repeat cycle: 0.25 days LST: Longitude (if geo): Asc/desc: URL: https://www.capellaspace.com/ |
| CARBONITE-2 UKSA | Operational (nominal) | 12 Jan 2018 | 31 Dec 2022 | Optical video imaging in a technology demonstration mission. Second satellite in the CARBONITE series of technology demonstration missions designed to demonstrate rapid-build techniques and to test COTS components and new avionics in orbit. | CARBONITE-2 Imager | Type: Sun-synchronous Altitude: 500 km Period: 94.6 min Inclination: 97.5 deg Repeat cycle: LST: 10:15:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.sstl.co.uk |
| CARTOSAT-2A Cartography Satellite - 2A ISRO | Operational (extended) | 28 Apr 2008 | 31 Dec 2022 | 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 min Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: |
| CARTOSAT-2B Cartography Satellite - 2B ISRO | Operational (extended) | 12 Jul 2010 | 31 Dec 2022 | 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 min Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: |
| CARTOSAT-2C Cartography Satellite - 2C ISRO | Operational (extended) | 22 Jun 2016 | 31 Dec 2022 | High precision large-scale cartographic mapping and thematic applications with MX data at 1:4000 scales. | HRMX, PAN (Cartosat-2C/2E) | Type: Sun-synchronous Altitude: 635 km Period: 97.4 min Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: |
| CARTOSAT-2E Cartography Satellite - 2E ISRO | Operational (nominal) | 23 Jun 2017 | 31 Dec 2023 | High precision large-scale cartographic mapping and thematic applications with MX data at 1:4000 scales. | HRMX, PAN (Cartosat-2C/2E) | Type: Sun-synchronous Altitude: 635 km Period: 97.4 min Inclination: 97.87 deg Repeat cycle: 5 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: |
| CARTOSAT-3 Cartography Satellite - 3 ISRO | Operational (nominal) | 27 Nov 2019 | 27 Nov 2024 | Suitable for cadastral and infrastructure mapping and analysis. | PAN (Cartosat-3), MX (Cartosat-3) | Type: Sun-synchronous Altitude: 450 km Period: Inclination: 97.9 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| CAS500-1 Compact Advanced Satellite 500 -1 KARI / KAI / NGII | Operational (nominal) | 22 Mar 2021 | 22 Mar 2025 | Cartography, land use and planning | High Resolution Optical Sensor | Type: Sun-synchronous Altitude: 528 km Period: 89.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|--|---|
| CAS500-2 Compact Advanced Satellite 500 -2 KAI / NGII / KARI | Approved | 31 Dec 2023 | 15 May 2027 | Cartography, land use and planning | High Resolution Optical Sensor (CAS500-2) | Type: Sun-synchronous Altitude: 528 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: |
| CAS500-4 Compact Advanced Satellite 500 -4 KAI / KARI | Approved | 31 Dec 2023 | 31 Dec 2028 | Agricultural and forest monitoring | Compact Advanced Payload Wide Swath (CAS500-4) | Type: Sun-synchronous Altitude: 900 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50:00 Longitude (if geo): Asc/desc: Ascending URL: |
| CAS500-5 Compact Advanced Satellite 500 -5 KAI / KARI | Approved | 31 Dec 2025 | 31 Dec 2029 | Water resource monitoring | SAR (CAS500-5) | Type: Sun-synchronous Altitude: 505 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50:00 Longitude (if geo): Asc/desc: Ascending URL: |
| CBERS-4 China Brazil Earth Resources Satellite -4 INPE / CRESDA | Operational (extended) | 07 Dec 2014 | 31 Dec 2022 | Earth resources, environmental monitoring, land surface. | WFI-2, MUX, DCS, IRS, PAN (CBERS) | Type: Sun-synchronous Altitude: 778 km Period: 100.3 min Inclination: 98.5 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cbears.inpe.br/ |
| CBERS-4A China Brazil Earth Resources Satellite -4 INPE / CRESDA | Operational (nominal) | 20 Dec 2019 | 20 Dec 2024 | Earth resources, environmental monitoring, land surface. | DCS, MUX (CBERS-4A), WFI (CBERS-4A), WPM | Type: Sun-synchronous Altitude: 629 km Period: 97.9 min Inclination: 97.9 deg Repeat cycle: 31 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cbears.inpe.br/ |
| CDARS NOAA / USAF | Approved | 10 Oct 2022 | 01 Dec 2025 | Maintain three-orbit continuity for the Argos and SARSAT-COSPAS programs. | S&R (NOAA), ARGOS-4 | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.nesdis.noaa.gov/ipss/ |
| CFOSAT Chinese-French Oceanic SATellite CNES / CNSA | Operational (nominal) | 29 Oct 2018 | 29 Oct 2023 | The primary objective of CFOSAT is to monitor at the global scale the wind and waves at the ocean surface. | SWIM, SCAT | Type: Sun-synchronous Altitude: 519 km Period: 94.7 min Inclination: 97.5 deg Repeat cycle: LST: 7:00 AM Longitude (if geo): Asc/desc: Descending URL: |
| CLARREO Pathfinder-on-ISS International Space Station/Climate Absolute Radiance & Reflectivity Observatory Pathfinder NASA | Approved | 15 Dec 2023 | 30 Apr 2024 | 1 year nominal mission. The goal of the Climate Absolute Radiance and Reflectivity Observatory (CLARREO) mission is to improve our understanding of climate change by providing high accuracy measurements of the change in key climate variables over decadal timescales. CLARREO Pathfinder is a technical demonstration on the ISS and a major step in reducing the cost and technical risk for these high accuracy measurements. | CLARREO Pathfinder Reflected Solar (hyperspectral) | Type: Inclined, non-sun-synchronous Altitude: 425 km Period: 90 min Inclination: 51 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://clareo-pathfinder.larc.nasa.gov/ |
| CloudSat NASA / DoD (USA) / CSA | Operational (extended) | 28 Apr 2006 | 30 Sep 2023 | 22-month nominal mission life, currently in extended operations. CloudSat uses advanced radar to "slice" through clouds to see their vertical structure, providing a completely new observational capability from space. First use of active 94 GHz radar from space to study clouds on global basis. | CPR (CloudSat) | Type: Sun-synchronous Altitude: 686 km Period: 98.9 min Inclination: 98.2 deg Repeat cycle: LST: 13:45 Longitude (if geo): Asc/desc: Ascending URL: http://cloudsat.atmos.colostate.edu/ |
| CO2Image DLR | Approved | 01 May 2026 | 01 May 2029 | Mission Goal: The mission shall demonstrate the feasibility of verifying carbon dioxide emissions from localized sources such as coal-fired power plants down to medium source strength (>1 MtCO2/yr) worldwide. Application: Independent verification of reported emissions as a cornerstone toward emission accounting and reduction measures such as agreed on in the Paris climate agreement. In 2018, coal-fired power plants accounted for 30% of the global man-made carbon dioxide emissions. | CO2SIS | Type: Sun-synchronous Altitude: 500 km Period: 92.2 min Inclination: Repeat cycle: LST: 11:00:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.dlr.de/pa/en/desktopdefault.aspx/tabid-2342/6725_read-6690/ |
| CO3D Constellation Optique 3D CNES | Planned | 01 Dec 2023 | 31 Dec 2031 | Will provide global Digital Surface Models of landmasses between +/- 70° latitudes with a resolution of 1 m and in 3D. | Optical Instrument (CO3D) | Type: Sun-synchronous Altitude: 502 km Period: 94.78 min Inclination: 97.43 deg Repeat cycle: LST: 10:45:00 Longitude (if geo): Asc/desc: Descending URL: https://co3d.cnes.fr/fr |
| COSMIC-2 FM1 NOAA / NSPO / UCAR | Operational (nominal) | 25 Jun 2019 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |
| COSMIC-2 FM2 NOAA / UCAR | Operational (nominal) | 25 Jun 2019 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|---|--|
| COSMIC-2 FM3 NOAA / UCAR | Operational (nominal) | 25 Jun 2018 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |
| COSMIC-2 FM4 NOAA / UCAR | Operational (nominal) | 25 Jun 2018 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |
| COSMIC-2 FM5 NOAA / UCAR | Operational (nominal) | 25 Jun 2018 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |
| COSMIC-2 FM6 NOAA / UCAR | Operational (nominal) | 25 Jun 2018 | 01 Jan 2026 | This is a radio occultation mission supporting meteorology and ionosphere & climate measurements. 6-satellite constellation (equatorial). | TGRS, RF Beacon, IVM | Type: Altitude: 520 km Period: Inclination: 24 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.cosmic.ucar.edu/ |
| COSMO-SkyMed 1 Constellation of small Satellites for Mediterranean basin Observation - 1 ASI / MoD (Italy) | Operational (extended) | 08 Jun 2007 | 31 Dec 2022 | 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 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| COSMO-SkyMed 2 Constellation of small Satellites for Mediterranean basin Observation - 2 ASI / MoD (Italy) | Operational (extended) | 09 Dec 2007 | 31 Dec 2022 | 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 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| COSMO-SkyMed 4 Constellation of small Satellites for Mediterranean basin Observation - 4 ASI / MoD (Italy) | Operational (extended) | 06 Nov 2010 | 31 Dec 2022 | 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 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| CryoSat-2 CryoSat-2 (Earth Explorer Opportunity Mission) ESA | Operational (extended) | 08 Apr 2010 | 31 Dec 2024 | 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 min Inclination: 92 deg Repeat cycle: 369 days LST: 0.25 degree nodal regression per day Longitude (if geo): Asc/desc: N/A URL: http://www.esa.int/cryosat |
| CSES China Seismo-Electromagnetic Satellite CNSA / ASI | Operational (nominal) | 02 Feb 2018 | 31 Dec 2023 | Monitoring of electromagnetic field and waves, plasma and particle perturbations of the atmosphere, ionosphere and magnetosphere; and the study of their correlations with the occurrence of seismic events. Study of solar-terrestrial interactions and phenomena of solar physics; study of cosmic ray solar modulation. | HEPD | Type: Sun-synchronous Altitude: 507 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: 14:00 Longitude (if geo): Asc/desc: Descending URL: http://cses.roma2.infn.it/ |
| CSG-1 COSMO-SkyMed Second Generation - 1 ASI / MoD (Italy) | Operational (nominal) | 18 Dec 2019 | 18 Dec 2026 | Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications. | CSG SAR | Type: Sun-synchronous Altitude: 620 km Period: 97.1 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| CSG-2 COSMO-SkyMed Second Generation - 2 ASI / MoD (Italy) | Operational (nominal) | 31 Jan 2022 | 31 Dec 2028 | Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications. | CSG SAR | Type: Sun-synchronous Altitude: 620 km Period: 97.1 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| CSG-3 COSMO-SkyMed Second Generation - 3 ASI / MoD (Italy) | Approved | 01 Feb 2024 | 01 Feb 2031 | Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications. | CSG SAR | Type: Sun-synchronous Altitude: 620 km Period: 97.1 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |
| CSG-4 COSMO-SkyMed Second Generation - 4 ASI / MoD (Italy) | Approved | 01 Feb 2025 | 01 Feb 2032 | Environmental monitoring, surveillance and risk management applications, environmental resources management, maritime management, earth topographic mapping, law enforcement, informative / science applications. | CSG SAR | Type: Sun-synchronous Altitude: 620 km Period: 97.1 min Inclination: 97.8 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: https://www.asi.it/en/earth-science/cosmo-skymed/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|---|---|
| CubeMAP Earth System Processes Monitored in the Atmosphere by a Constellation of CubeSats ESA / UKSA | Approved | 30 Jun 2025 | 30 Jun 2028 | ESP-MACCS focusses on understanding and quantifying atmospheric processes in the upper troposphere and in the stratosphere. In particular, it will make observations in tropical and sub-tropical latitudes to observe gases such as water vapour, carbon dioxide, methane, ozone and nitrous oxide as well as aerosols – all of which play a key role in the greenhouse effect and climate change | TIS (ESP-MACCS), VNIR Hyperspectral Solar Disk Imager (ESP-MACCS) | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| CYGNSS Cyclone Global Navigation Satellite System NASA / NOAA | Operational (extended) | 15 Dec 2016 | 30 Sep 2023 | To understand the coupling between ocean surface properties, moist atmospheric thermodynamics, radiation and convective dynamics in the inner core of a Tropical Cyclone (TC) | DDMI (CYGNSS) | Type: Inclined, non-sun-synchronous Altitude: 520 km Period: 95 min Inclination: 35 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://ices-research.engin.umich.edu/missions/cygnss/ |
| DESIIS-on-15S DLR Earth Sensing Imaging Spectrometer for MUSES DLR | Operational (nominal) | 29 Jun 2018 | 31 Dec 2023 | DESIIS detects changes in the land surface, oceans and atmosphere; it will contribute to the development of effective measures to protect the environment and climate and allows scientists to detect changes in ecosystems and to make statements on the condition of forests and agricultural land. Among other things, its purpose is to secure and improve the global cultivation of food. | DESIIS | Type: Inclined, non-sun-synchronous Altitude: 407 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: |
| Diademe 1&2 CNES | Operational (nominal) | 15 Feb 1967 | 31 Dec 2050 | Geodetic measurements using satellite laser ranging. | RRA | Type: Inclined, non-sun-synchronous Altitude: 1200 km Period: 108 min Inclination: 40 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: http://gaileo.crt.go.jp/its/diademe.html |
| DMC3 Disaster Monitoring Constellation-3 UKSA / NRSCC / 21AT | Operational (nominal) | 10 Jul 2015 | 31 Dec 2023 | A constellation of 3 high resolution optical imaging satellites for land use monitoring, urban planning, crop monitoring and pollution monitoring | PAN (BJ-2), MSI (BJ-2) | Type: Sun-synchronous Altitude: 645 km Period: 97.7 min Inclination: 98 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.sstl.co.uk |
| DMSF F-15 Defense Meteorological Satellite Program F-15 NOAA / USAF | Operational (extended) | 12 Dec 1999 | 31 Dec 2022 | 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, SSMI, SSM/T-1, SSM/T-2, SSI/ES-2, SSJ4, SSM | Type: Sun-synchronous Altitude: 833 km Period: 101 min Inclination: 98.9 deg Repeat cycle: LST: 20:29 Longitude (if geo): Asc/desc: Ascending URL: http://dmsp.ngdc.noaa.gov/dmsp.html |
| DMSF F-16 Defense Meteorological Satellite Program F-16 NOAA / USAF | Operational (extended) | 18 Oct 2003 | 31 Dec 2023 | 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, SSMIS, SSM, SSI/ES-3, SSJ5, SSULI, SSUSI | Type: Sun-synchronous Altitude: 833 km Period: 101 min Inclination: 98.9 deg Repeat cycle: LST: 21:32 Longitude (if geo): Asc/desc: Ascending URL: http://dmsp.ngdc.noaa.gov/dmsp.html |
| DMSF F-17 Defense Meteorological Satellite Program F-17 NOAA / USAF | Operational (extended) | 04 Nov 2006 | 31 Dec 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, SSMIS, SSM, SSI/ES-3, SSULI, SSUSI | Type: Sun-synchronous Altitude: 850 km Period: 101 min Inclination: 98.7 deg Repeat cycle: LST: 17:31 Longitude (if geo): Asc/desc: Ascending URL: http://dmsp.ngdc.noaa.gov/dmsp.html |
| DMSF F-18 Defense Meteorological Satellite Program F-18 NOAA / USAF | Operational (extended) | 18 Oct 2009 | 31 Dec 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, SSMIS, SSM, SSI/ES-3, SSULI, SSUSI | Type: Sun-synchronous Altitude: 850 km Period: 101 min Inclination: 98.7 deg Repeat cycle: LST: 17:31 Longitude (if geo): Asc/desc: Ascending URL: http://dmsp.ngdc.noaa.gov/dmsp.html |
| DoT-1 Demonstration of Technology-1 UKSA | Operational (nominal) | 05 Jul 2019 | 31 Dec 2022 | Primary objective is to demonstrate SSTL's new Core Data Handling System (Core-DHS). Accommodation was made available for some additional experimental payloads including the SGR-ReSI-Z. | SGR-ReSI-Z | Type: Sun-synchronous Altitude: 520 km Period: 95.2 min Inclination: 97.6 deg Repeat cycle: LST: 15:00:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.sstl.co.uk |
| DSCOVR Deep Space Climate Observatory NOAA / USAF / NASA | Operational (extended) | 11 Feb 2015 | 01 Jan 2023 | Measure a combination of solar phenomena and earth science measurements. Provides 15 min warning for solar storms (CME) events. Provides full disk Earth observations at 10 wavelengths with 2-4 hour cadence. This mission is positioned at the Earth-Sun L-1 point. | NISTAR, EPIC, ES, PHA, PlasMag, FC | Type: Earth-Sun L-1 Altitude: 150000 km Period: 259200 min Inclination: Repeat cycle: 1 days LST: Longitude (if geo): Asc/desc: NA URL: http://www.nesdis.noaa.gov/DSCOVR/ |
| DubaiSat-2 MBRSC / UAE SA | Operational (nominal) | 21 Nov 2013 | 31 Dec 2022 | DubaiSat-2 is a continuation of the Knowledge Transfer Programme that started with the manufacturing of DubaiSat-1. It provides satellite imaging services at a resolution of 1 meter to meet the needs of local and international clients. The mission objectives are: to develop a mini satellite system of less than 300 kg for Earth observation; to provide electro-optical imagery, that can be commercialized, of the UAE and other areas with a spatial resolution of 1m PAN (panchromatic) and 4m MS (multispectral) from a reference orbit of 600 km altitude; to develop and implement new technologies, not used in DubaiSat-1, that can be used in future space programmes; and, to continue training for UAE's space programme. | HIRAIS | Type: Sun-synchronous Altitude: 600 km Period: Inclination: 97.1 deg Repeat cycle: 8 days LST: 10:30:00 Longitude (if geo): Asc/desc: Descending URL: https://mbrsc.ae/en/page/dubai-sat-2 |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|---|---|
| EarthCARE ESA / JAXA | Approved | 30 Sep 2023 | 30 Sep 2026 | 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. | OPR (EarthCARE), ATLID, BBR (EarthCARE), MSI (EarthCARE) | Type: Sun-synchronous Altitude: 393 km Period: Inclination: 97 deg Repeat cycle: 25 days LST: 14:00 Longitude (if geo): Asc/desc: Descending URL: http://www.esa.int/Our_Activities/Observing_the_Earth/The_Living_Planet_Programme/Earth_Explorers/EarthCARE/ESA_s_cloud_aerosol_and_radiation_mission https://www.eorc.jaxa.jp/EARTH_CARE/index.html |
| ECOSTRESS-on-ISS International Space Station/ECOSystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) NASA / USGS | Operational (extended) | 29 Jun 2018 | 30 Sep 2023 | Uses a high-resolution thermal infrared radiometer to measure plant evapotranspiration, the loss of water from growing leaves and evaporation from the soil. These data will reveal how ecosystems change with climate and provide a critical link between the water cycle and effectiveness of plant growth, both natural and agricultural. | ECOSTRESS | Type: Inclined, non-sun-synchronous Altitude: 417 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://ecostress.jpl.nasa.gov/ |
| Elektro-L N2 Geostationary Operational Meteorological Satellite ROSKOSMOS / ROSHYDROMET | Operational (nominal) | 11 Dec 2015 | 11 Dec 2025 | Hydrometeorology, heliogeophysics, climatology, cloud information. | MSU-GS, DCS, GGAK-E | Type: Geostationary Altitude: 35800 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 76 deg Asc/desc: N/A URL: http://planet.itp.ru; http://eng.nisomz.ru/ks_dzz/satellites |
| Elektro-L N3 Geostationary Operational Meteorological Satellite ROSKOSMOS / ROSHYDROMET | Operational (nominal) | 24 Dec 2019 | 31 Dec 2029 | Hydrometeorology, heliogeophysics, climatology, cloud information. | MSU-GS, DCS, GGAK-E | Type: Geostationary Altitude: 35800 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 165.8 deg Asc/desc: N/A URL: http://planet.itp.ru; http://eng.nisomz.ru/ks_dzz/satellites |
| Elektro-L N4 Geostationary Operational Meteorological Satellite ROSKOSMOS / ROSHYDROMET | Approved | 31 Dec 2023 | 31 Dec 2032 | Hydrometeorology, heliogeophysics, climatology, cloud information. | MSU-GS, DCS, GGAK-E | Type: Geostationary Altitude: 35800 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: |
| Elektro-L N5 Geostationary Operational Meteorological Satellite ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2023 | 31 Dec 2033 | Hydrometeorology, heliogeophysics, climatology, cloud information. | MSU-GS, DCS, GGAK-E | Type: Geostationary Altitude: 35800 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: |
| EMIT-on-ISS International Space Station/Earth Surface Mineral Dust Source Investigation (EMIT) NASA | Commissioning | 14 Jul 2022 | 30 Sep 2023 | Imaging spectroscopy from the visible to short wavelength infrared (VSWIR) to close the gap in knowledge of the composition of the Earth's mineral dust source regions. Uses these new measurements with Earth System models to constrain the sign and magnitude of current dust-related radiative forcing at regional and global scales and predict the increase or decrease of available dust sources under future climate scenarios. Deliver these first of their kind comprehensive measurements to the Earth science and applications community. | EMIT | Type: Inclined, non-sun-synchronous Altitude: 417 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://earth.jpl.nasa.gov/emit/ |
| EnMAP Environmental Mapping & Analysis Program DLR | Commissioning | 01 Apr 2022 | 20 Sep 2026 | Hyperspectral imaging, land surface, geological and environmental investigation. | HSI | Type: Sun-synchronous Altitude: 650 km Period: 97.5 min Inclination: Repeat cycle: 21 days LST: 11:00 Longitude (if geo): Asc/desc: Descending URL: http://www.enmap.org/ |
| ePOP on CASSIOPE Enhanced Polar Outflow Probe on the CASSADE, SmallSat and Ionospheric Polar Explorer CSA / MDA / University of Calgary | Operational (extended) | 29 Sep 2013 | 01 Apr 2024 | The ePOP probe observes the Earth's ionosphere, where space meets the upper atmosphere. The instruments are used in conjunction with other satellite-based and ground-based instruments to analyze radio wave propagation in the ionosphere, measure the densities of ionized particles, and observe the aurora from space, all as they respond to space weather. The orbit is 450 km to 1250 km. Note: MDA is the owner and University of Calgary is the operator. | CER, SEI, FAI, RRI, GAP, IRM, MGF, NMS | Type: Inclined, non-sun-synchronous Altitude: 450 km Period: 101 min Inclination: 81 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: http://epop.phys.ucalgary.ca/ |
| EOS-1 Electro-optical Infrared Weather System Geostationary - 1 USSF | Operational (extended) | 24 May 2006 | 31 Dec 2023 | 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, DCS (GOES-R Series), LRIT | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 75 deg Asc/desc: N/A URL: http://www.ospo.noaa.gov/Operations/GOES/index.html |
| FLEX Fluorescence Explorer ESA | Approved | 31 Mar 2025 | 31 Mar 2028 | Mapping vegetation fluorescence to quantify photosynthetic activity. | FLORIS | Type: Sun-synchronous Altitude: 815 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://earth.esa.int/web/guest/missions/esa-future-missions/flex |
| Fomosat-5 NSPO | Operational (nominal) | 24 Aug 2017 | 31 Dec 2022 | Build up the domestic capability for the high-resolution optical remote sensing. | RSI, AIP | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|--|--|
| FORUM ESA | Approved | 31 Jul 2027 | 31 Dec 2031 | Earth observation mission to measure infrared radiation from the Earth for the first time, will give scientists and climatologists the data they need to improve their global warming forecasts. | Fourier Transform Spectrometer | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30:00 Longitude (if geo): Asc/desc: Descending URL: |
| FY-2G FY-2G Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Operational (extended) | 31 Dec 2014 | 31 Dec 2022 | 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: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-2H FY-2H Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Operational (nominal) | 05 Jun 2018 | 31 Dec 2022 | 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: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3C FY-3C Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Operational (extended) | 23 Sep 2013 | 31 Dec 2022 | Meteorology and environmental monitoring; data collection and redistribution. (Operational follow-on to FY-3B). FY-3C suffered a problem on May 30th 2015 and has recovered gradually over time. At present, 10 of 12 onboard instruments are back in operation. | IRAS, MWTS-2, MWRI, VIRR, ERM, MERSI, TOU/SBUS, GNOS, MWHS-2, SES, SIM-2 | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.753 deg Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3D FY-3D Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Operational (nominal) | 15 Nov 2017 | 31 Dec 2022 | Meteorology and environmental monitoring; data collection and redistribution. | MWTS-2, HIRAS, MWRI, ASI, GAS, GNOS, MERSI-2, MWHS-2, SES, WAI, SWS/SEM/HEPD, SWS/SEM/IMS | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.753 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3E FY-3E Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Operational (nominal) | 05 Jul 2021 | 31 Dec 2026 | Meteorology and environmental monitoring; data collection and redistribution. | MWTS-2, HIRAS, ASI, ERM-2, GNOS, MWHS-2, SES, WindRAD, SIM-2, MERSI-L, SSIM, SWS/SEM/HEPD, SWS/SEM/IMS, SWS/TH-IPM | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.753 deg Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3F FY-3F Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Approved | 31 Dec 2023 | 31 Dec 2028 | Meteorology and environmental monitoring; data collection and redistribution. | MWTS-2, HIRAS, MVIRS, MWRI, ASI, GAS, GNOS, MWHS-2, SES, MERSI-3 | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.753 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3H FY-3H Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2024 | 31 Dec 2029 | Meteorology and environmental monitoring; data collection and redistribution. | MWTS-2, HIRAS, MVIRS, ASI, ERM-2, GAS, GNOS, MWHS-2, OMS, WindRAD, SIM-2, MERSI-3 | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3I FY-3I Polar-orbiting Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2024 | 31 Dec 2029 | Meteorology and environmental monitoring; data collection and redistribution. | MWTS-2, HIRAS, MVIRS, ASI, GNOS, MWHS-2, OMS, WindRAD, SIM-2, MERSI-L, SSIM, SWS/SEM/HEPD, SWS/SEM/IMS, SWS/TH-IPM | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: 10:00 Longitude (if geo): Asc/desc: Descending URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-3RM-1 FY-3 Rainfall Mission 1 NSMC-CMA | Approved | 31 Dec 2023 | 31 Dec 2028 | Rainfall measurement. | MWRI, GNOS, MERSI-S, PR | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| FY-3RM-2 FY-3 Rainfall Mission 2 NSMC-CMA | Planned | 31 Dec 2025 | 31 Dec 2030 | Rainfall measurement. | MWRI, GNOS, MERSI-S, PR | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|---|-----------------------------|--|
| FY-4A FY-4A Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Operational (nominal) | 11 Dec 2016 | 31 Dec 2023 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4B FY-4B Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Operational (nominal) | 03 Jun 2021 | 31 Dec 2028 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4C FY-4C Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2025 | 31 Dec 2032 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4D FY-4D Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2026 | 31 Dec 2033 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4E FY-4E Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2027 | 31 Dec 2034 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4F FY-4F Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2030 | 31 Dec 2037 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| FY-4G FY-4G Geostationary Meteorological Satellite NSMC-CMA / NRSCC | Planned | 31 Dec 2033 | 31 Dec 2040 | Meteorology and environmental monitoring; data collection and redistribution. | LMI, AGRI, GIIRS, SEMIP/SEM | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -105 deg Asc/desc: NA URL: http://www.nsmc.cma.gov.cn/en/NSMC/Channels/outline.html |
| GCOM-C Global Change Observation Mission-Climate JAXA | Operational (nominal) | 23 Dec 2017 | 23 Dec 2022 | Understanding of climate change mechanism. | SGLI | Type: Sun-synchronous Altitude: 798 km Period: 101 min Inclination: 98.6 deg Repeat cycle: 34 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: https://global.jaxa.jp/projects/sat/gcom_c/ |
| GCOM-W Global Change Observation Mission-Water JAXA | Operational (extended) | 18 May 2012 | 31 Dec 2023 | Understanding of the water cycle mechanism. | AMS2 | Type: Sun-synchronous Altitude: 700 km Period: 98 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: https://global.jaxa.jp/projects/sat/gcom_w/ https://suzaku.eorc.jaxa.jp/GCOM_W/ |
| GEDI-on-ISS International Space Station/Global Ecosystem Dynamics Investigation (GEDI) Lidar NASA | Operational (extended) | 05 Dec 2018 | 30 Sep 2023 | This project will use a laser-based system to study a range of climates, including the observation of the forest canopy structure over the tropics, and the tundra in high northern latitudes. This data will help scientists better understand the changes in natural carbon storage within the carbon cycle from both human-influenced activities and natural climate variations. | GEDI | Type: Inclined, non-sun-synchronous Altitude: 417 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://science.nasa.gov/missions/gedi |
| GEO-KOMPSAT-2A Geostationary Earth Orbit - Korea Multi-Purpose Sa KMA / Hams / KARI | Operational (nominal) | 04 Dec 2018 | 24 Jul 2029 | Korea's geostationary meteorological satellite series. | Advanced MI | Type: Geostationary Altitude: 35786 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 128.2 deg Asc/desc: NA URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|---|--|
| GEO-KOMPSAT-2B Geostationary Korea Multi-Purpose Satellite-2B KARI / KIOST / NIER / BATC | Operational (nominal) | 18 Feb 2020 | 18 Feb 2030 | Korea's geostationary oceanographic and environmental satellite. | Advanced GOCI, GEMS | Type: Geostationary Altitude: 35786 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 128.2 deg Asc/desc: NA URL: https://kosc.kiost.ac.kr |
| GeoCarb Geostationary Carbon Cycle Observatory NASA | Approved | 30 Jun 2025 | 30 Jun 2028 | The GeoCarb mission provides persistent daytime measurements from a geostationary orbit (85° West +/- 10°) of the concentration of carbon dioxide (CO ₂), methane (CH ₄), carbon monoxide (CO), and it also provides measurements of solar-induced fluorescence (SIF). By measuring daily over the Americas (55° N/S Latitude) CO ₂ , CH ₄ , and CO concentrations and SIF under changing conditions at fine spatial scales roughly (5kmx5km), GeoCarb enables determination of major anthropogenic sources of CO ₂ and CH ₄ and breakthrough investigations of their natural sources and sinks. This provides the basis for a transformational improvement in our understanding of the carbon cycle, and it demonstrates an effective approach to monitoring CO ₂ and CH ₄ , the two most important greenhouse gases that is synergistic with measurements from Low Earth Orbit (LEO). | Scanning Spectrometer (GeoCarb) | Type: Geostationary Altitude: 35786 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 85 deg Asc/desc: URL: https://www.ou.edu/geocarb |
| GF-1 Gaofen-1 CRESDA | Operational (extended) | 26 Apr 2013 | 31 Dec 2022 | Earth resources, environmental monitoring, land surface. | MUX (GF-1), PAN (GF-1), WFV | Type: Sun-synchronous Altitude: 644 km Period: 97.466 min Inclination: 97.9 deg Repeat cycle: 41 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| GF-2 Gaofen-2 CRESDA | Operational (extended) | 19 Aug 2014 | 31 Dec 2022 | Earth resources, environmental monitoring, land surface. | MUX (GF-2), PAN (GF-2) | Type: Sun-synchronous Altitude: 631 km Period: 97.196 min Inclination: 97.9 deg Repeat cycle: 69 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| GF-3 Gaofen-3 CRESDA | Operational (nominal) | 10 Aug 2016 | 10 Aug 2024 | Earth resources, environmental monitoring, land surface. | C-SAR | Type: Sun-synchronous Altitude: 755 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| GF-4 Gaofen-4 CRESDA / NSMC-CMA | Operational (nominal) | 29 Dec 2015 | 29 Dec 2023 | Earth resources, environmental monitoring, land surface. | MWIR (GF-4), VNIR (GF-4) | Type: Geostationary Altitude: 36000 km Period: Inclination: 0 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: http://www.cresda.com/ |
| GLIMR Geosynchronous Littoral Imaging and Monitoring Radiometer NASA | Approved | 01 Dec 2026 | 01 Mar 2030 | GLIMR will provide observations of rapidly evolving processes of phytoplankton physiology, growth and bloom evolution, and episodic and seasonal river-to-sea fluxes of materials. GLIMR will identify and track blooms of the harmful algae, <i>Karenia brevis</i> , and identify and track oil spills and seeps of sufficient size in the Gulf of Mexico and other selected coastal regions of North and South America. | GLIMR Instrument | Type: Geostationary Altitude: 36000 km Period: Inclination: 98 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: https://eosppo.gfc.nasa.gov/missions/geosynchronous-littoral-imaging-and-monitoring-radiometer-ev-5 |
| GOES-14 Geostationary Operational Environmental Satellite - 14 NOAA | Operational (extended) | 27 Jun 2009 | 01 Apr 2030 | Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX. GOES-14 was placed into on-orbit storage on February 13, 2013. | S&R (GOES), SXI, Sounder, Imager, GOES Comms, SEM (GOES), A-DCS4, DCS (GOES-R Series), LRIT | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 105 deg Asc/desc: NA URL: http://www.ospo.noaa.gov/Operations/GOES/index.html |
| GOES-15 Geostationary Operational Environmental Satellite - 15 NOAA | Operational (extended) | 04 Mar 2010 | 01 Dec 2028 | Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering, WEFAX. GOES-15 was placed into on-orbit storage on August 9, 2020. | S&R (GOES), SXI, Sounder, Imager, GOES Comms, SEM (GOES), A-DCS4, DCS (GOES-R Series), LRIT | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 135 deg Asc/desc: NA URL: http://www.ospo.noaa.gov/Operations/GOES/index.html |
| GOES-16 Geostationary Operational Environmental Satellite 16 NOAA / NASA | Operational (nominal) | 19 Nov 2016 | 01 Jan 2034 | 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: NA URL: http://www.goes-r.gov/ |
| GOES-17 Geostationary Operational Environmental Satellite - 17 NOAA / NASA | Operational (nominal) | 01 Mar 2018 | 01 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: NA URL: http://www.goes-r.gov/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|---|--|
| GOES-18 Geostationary Operational Environmental Satellite - 18 NOAA / NASA | Commissioning | 01 Mar 2022 | 01 Oct 2035 | 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: NA URL: http://www.goes-r.gov/ |
| GOES-U Geostationary Operational Environmental Satellite - U NOAA / NASA | Planned | 30 Nov 2023 | 30 Nov 2034 | Meteorology (primary mission), search and rescue, space environment monitoring, data collection platform, data gathering. | ABI, GLM, Magnetometer (NOAA), EXIS, SEISS, SUVI, DCS (GOES-R Series), CCOR | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: http://www.goes-r.gov/ |
| GOMX4 GomSpace Express-4 ESA / NSO | Operational (extended) | 02 Feb 2018 | 31 Dec 2022 | Demonstration of hyperspectral operations on a Cubesat. Demonstration of early warning capability leveraging heavy onboard processing for flooding, change detection, crop water factor, vegetation monitoring. Hyperspectral VNIR. | HyperScout | Type: Sun-synchronous Altitude: 500 km Period: Inclination: Repeat cycle: LST: 14:00:00 Longitude (if geo): Asc/desc: Descending URL: |
| GOSAT Greenhouse gases Observing SATellite JAXA / MOE (Japan) / NIES (Japan) | Operational (extended) | 23 Jan 2009 | 31 Dec 2023 | Observation of greenhouse gases (CO ₂ , CH ₄) and solar-induced chlorophyll fluorescence (SIF). | TANSO-CAI, TANSO-FTS | Type: Sun-synchronous Altitude: 666 km Period: 98.18 min Inclination: 98.06 deg Repeat cycle: 3 days LST: 13:00 Longitude (if geo): Asc/desc: Descending URL: https://www.eorc.jaxa.jp/GOSAT/index.html |
| GOSAT-2 Greenhouse gases Observing SATellite-2 JAXA / MOE (Japan) / NIES (Japan) | Operational (nominal) | 29 Oct 2018 | 31 Dec 2023 | Observation of greenhouse gases (CO ₂ , CH ₄ , CO) and solar-induced chlorophyll fluorescence (SIF). | TANSO-CAI-2, TANSO-FTS-2 | Type: Sun-synchronous Altitude: 613 km Period: 98.18 min Inclination: 97.8 deg Repeat cycle: 6 days LST: 13:00 Longitude (if geo): Asc/desc: Descending URL: https://www.eorc.jaxa.jp/GOSAT/index.html |
| GOSAT-GW Global Observing SATellite for Greenhouse gases and Water cycle JAXA / MOE (Japan) / NIES (Japan) | Approved | 31 Mar 2024 | 31 Mar 2029 | Observation of greenhouse gases and understanding of water cycle mechanisms | AMSR-3, TANSO-FTS-3 | Type: Sun-synchronous Altitude: 666 km Period: 98.18 min Inclination: 98.06 deg Repeat cycle: 3 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: |
| Goumang CAST | Operational (nominal) | 04 Aug 2022 | 04 Aug 2028 | Goumang is a terrestrial ecosystem carbon monitoring satellite. | Laser Radar, Multi-Angle Multi-Spectral Camera, Hyperspectral Detector, Polarisation Imager | Type: Sun-synchronous Altitude: 506 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| GPM Core Global Precipitation Measurement Mission Core spacecraft NASA / JAXA | Operational (extended) | 27 Feb 2014 | 30 Sep 2026 | 3-year nominal mission life, 5-year goal. Study of global precipitation, evaporation, and the water cycle. 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 min Inclination: 65 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: https://gpm.nasa.gov/ https://www.eorc.jaxa.jp/GPM/ |
| GRACE-FO Gravity Recovery and Climate Experiment - Followon NASA / GFZ | Operational (nominal) | 22 May 2018 | 28 May 2023 | 5-year nominal mission life. Extremely high precision gravity measurements for use in construction of gravity field models. GRACE-FO will consist of two satellites (A, B) serving one mission in the same manner as the original GRACE mission | LRI, MWI | Type: Inclined, non-sun-synchronous Altitude: 500 km Period: 98 min Inclination: 89 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: https://www.nasa.gov/missions/grace-fo |
| Hamony ESA | Approved | 31 Dec 2029 | 31 Dec 2034 | The space segment consists of two companion satellites to S1, each carrying a receive-only SAR instrument, complemented by a TIR payload. The companion satellites fly in two different configurations with S1. In the stereo configuration, one companion is leading and the other is trailing S1. The optimum distance to S1 (stereo baseline) is determined from a complex trade-off on the performance of both instruments. One of the strongest drivers is the improved viewing geometry associated with large squint angles and both concepts therefore use a long baseline (350 km for Concept A and 400 km for Concept B). The Hamony orbit is dictated by the S1 orbit, which is a Sun-synchronous, frozen orbit with a repetition cycle of 12 days, during which 175 orbits are completed. Hamony is dedicated to the observation and quantification of small-scale motion and deformation (velocity gradient) fields, primarily, at the air-sea interface (winds, waves, and surface currents, including measurements over extreme events), of the solid Earth (tectonic strain), and in the cryosphere (glacier flows and surface height changes). Primary mission objectives: 1. Air-sea interaction, tropical and extra-tropical cyclones, and ocean mesoscale and submesoscale processes; 2. Tectonic strain; and 3. Glacier and ice-sheet mass balance and glacier dynamics. Hamony will make significant contributions to other science domains, including volcanoes, permafrost, land-slides and several sea-ice objectives. These have been captured as secondary mission objectives and have been studied in some depth in the Phase 0 science studies. | Synthetic Aperture Radar, Multiview Thermal-Infrared | Type: Sun-synchronous Altitude: 693 km Period: 98.74 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|--|--|---|
| Himawari-8 JMA | Operational (nominal) | 07 Oct 2014 | 31 Mar 2030 | Meteorology, environmental monitoring, data collection platform | AHI, Himawari Comms, Himawari DCS | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 140.7 deg Asc/desc: NA URL: https://www.data.jma.go.jp/mscweb/en/support/support.htm |
| Himawari-9 JMA | Operational (nominal) | 02 Nov 2016 | 31 Mar 2030 | Meteorology, environmental monitoring, data collection platform | AHI, Himawari Comms, Himawari DCS | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): 140.7 deg Asc/desc: NA URL: https://www.data.jma.go.jp/mscweb/en/support/support.htm |
| HJ-1C Huan Jing-1C CRESDA / CAST | Operational (extended) | 19 Nov 2012 | 31 Dec 2022 | Disaster and environment monitoring and forecasting. Small satellite constellation. | S-Band SAR | Type: Inclined, non-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/ |
| HJ-2A Huan Jing-2A CRESDA / CAST | Operational (nominal) | 27 Sep 2020 | 31 Dec 2025 | Disaster and environment monitoring and forecasting. Small satellite constellation. | HSI (HJ-1A) Copy, IR (HJ-1B) Copy, CCD (HJ) Copy | Type: Sun-synchronous Altitude: 650 km Period: Inclination: 97.9 deg Repeat cycle: 31 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| HJ-2B Huan Jing-2B CRESDA / CAST | Operational (nominal) | 27 Sep 2020 | 31 Dec 2025 | Disaster and environment monitoring and forecasting. Small satellite constellation. | HSI (HJ-1A) Copy, IR (HJ-1B) Copy, CCD (HJ) Copy | Type: Sun-synchronous Altitude: 650 km Period: Inclination: 97.9 deg Repeat cycle: 31 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| HRWS SAR High Resolution Wide Swath SAR DLR | Planned | 31 Dec 2029 | 30 Jun 2036 | Cartography, land surface, civil planning and mapping, digital terrain models, environmental monitoring, digital elevation models. | HRWS X-Band Digital Beamforming SAR | Type: Sun-synchronous Altitude: 514 km Period: 94.85 min Inclination: 97.4 deg Repeat cycle: 11 days LST: 19:00 Longitude (if geo): Asc/desc: Ascending URL: |
| HY-1C Ocean color satellite C NSOAS / CAST | Operational (nominal) | 07 Sep 2018 | 31 Dec 2024 | Detecting ocean colour and sea surface temperature. | COCTS, CZI | Type: Sun-synchronous Altitude: 798 km Period: Inclination: 98.6 deg Repeat cycle: 7 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cast.cn/ |
| HY-1D Ocean color satellite D NSOAS / CAST | Operational (nominal) | 11 Jun 2020 | 31 Dec 2026 | Detecting ocean colour and sea surface temperature. | COCTS, CZI | Type: Sun-synchronous Altitude: 798 km Period: Inclination: 98.6 deg Repeat cycle: 7 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cast.cn/ |
| HY-1E Ocean color satellite E NSOAS / CAST | Planned | 31 Dec 2022 | 31 Dec 2028 | Detecting ocean colour and sea surface temperature. | COCTS, CZI | Type: Sun-synchronous Altitude: 798 km Period: Inclination: 98.6 deg Repeat cycle: 7 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cast.cn/ |
| HY-1F Ocean color satellite F NSOAS / CAST | Planned | 31 Dec 2024 | 31 Dec 2030 | Detecting ocean colour and sea surface temperature. | COCTS, CZI | Type: Sun-synchronous Altitude: 798 km Period: Inclination: 98.6 deg Repeat cycle: 7 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cast.cn/ |
| HY-2A Ocean dynamics satellite A NSOAS / CAST | Operational (extended) | 16 Aug 2011 | 31 Dec 2022 | Detecting ocean surface temperature, wind field, wave and topography. | DORIS-NG, RAD, SCAT, ALT | Type: Sun-synchronous Altitude: 963 km Period: 104 min Inclination: 99.3 deg Repeat cycle: 14 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: http://www.naoas.gov.cn/ |
| HY-2B Ocean dynamics satellite B NSOAS / CAST | Operational (nominal) | 25 Oct 2018 | 31 Dec 2023 | 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: http://www.naoas.gov.cn/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|-----------------------|-------------|-------------|---|--------------------------------|---|
| HY-2C Ocean dynamics satellite C NSOAS / CAST | Operational (nominal) | 21 Sep 2020 | 31 Dec 2025 | Detecting ocean surface temperature, wind field, wave and topography. | RAD, SCAT, ALT | Type: Inclined, non-sun-synchronous Altitude: 957 km Period: Inclination: 66 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: http://www.naoas.gov.cn/ |
| HY-2D Ocean dynamics satellite D NSOAS / CAST | Operational (nominal) | 19 May 2021 | 31 Dec 2026 | 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: http://www.naoas.gov.cn/ |
| HY-2E Ocean dynamics satellite E NSOAS / CAST | Planned | 31 Dec 2023 | 31 Dec 2028 | 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: http://www.naoas.gov.cn/ |
| HY-2F Ocean dynamics satellite F NSOAS / CAST | Planned | 31 Dec 2024 | 31 Dec 2029 | 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: http://www.naoas.gov.cn/ |
| HY-2G Ocean dynamics satellite G NSOAS / CAST | Planned | 31 Dec 2025 | 31 Dec 2030 | 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: http://www.naoas.gov.cn/ |
| HY-2H Ocean dynamics satellite H NSOAS / CAST | Planned | 31 Dec 2023 | 31 Dec 2028 | 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: http://www.naoas.gov.cn/ |
| HY-3A NSOAS / CAST | Planned | 31 Dec 2022 | 31 Dec 2029 | 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 | 31 Dec 2022 | 31 Dec 2029 | 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 | 06 Jan 2024 | 31 Dec 2032 | 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-3D NSOAS / CAST | Planned | 31 Dec 2025 | 31 Dec 2033 | Ocean monitoring, environmental protection, coastal zone survey, etc. | WSAR | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| HydroGNSS ESA / UKSA | Approved | 31 Oct 2024 | 31 Oct 2026 | HydroGNSS is a 40kg satellite that will be built and operated by SSTL to take measurements of key hydrological climate variables, including soil moisture, freeze/thaw state over permafrost, tundra and wetlands, and above ground biomass, using a technique called GNSS Reflectometry. Knowledge of these variables helps scientists understand climate change and contributes towards weather modelling, ecology mapping, agricultural planning and flood preparedness. | GNSS Reflectometer (HydroGNSS) | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| ICESat-2 Ice, Cloud, and Land Elevation Satellite 2 NASA | Operational (nominal) | 15 Sep 2018 | 31 May 2034 | 3-year nominal mission life, 5-year goal. 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 min Inclination: 92 deg Repeat cycle: 91 days LST: Longitude (if geo): Asc/desc: TBD URL: https://icesat-2.gsfc.nasa.gov/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|---|--|
| INCUS Investigation of Convective Updrafts (INCUS) NASA / NOAA | Approved | 30 Nov 2026 | 31 Jan 2029 | Characterize the relationship between Convective Mass Flux and atmospheric environmental properties by providing novel measurements of time-differenced profiles of radar reflectivity. INCUS objectives are to determine: (1) the predominant environmental properties controlling convective mass flux in tropical convective storms; (2) the relationship between convective mass flux and high anvil clouds; (3) the relationship between convective mass flux and the type and intensity of the extreme weather produced; and then to evaluate these relationships between convective mass flux and environmental factors, high anvil clouds, and extreme weather within weather and climate models. Application: improve the nowcasting of rapidly developing convective storms by expanding the inputs to nowcasting systems. | DAR (INCUS), DMR (INCUS) | Type: Inclined, non-sun-synchronous Altitude: 500 km Period: 04 min Inclination: 28.5 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: TBD |
| INSAT-3D Indian National Satellite - 3D ISRO | Operational (extended) | 26 Jul 2013 | 31 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 deg Asc/desc: N/A URL: http://www.isro.org/ |
| INSAT-3DR Indian National Satellite - 3DR (repeat) ISRO | Operational (nominal) | 08 Sep 2016 | 31 Dec 2025 | 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 deg Asc/desc: N/A URL: http://www.isro.org/ |
| INSAT-3DS Indian National Satellite - 3DS (Spare) ISRO | Planned | 08 Sep 2023 | 30 Sep 2030 | Meteorology, data collection and communication, search and rescue. | Imager (INSAT 3D), Sounder (INSAT) | Type: Geostationary Altitude: 36000 km Period: Inclination: Repeat cycle: LST: Longitude (if geo): -93.5 deg Asc/desc: N/A URL: http://www.isro.org/ |
| Ionospha-M N1 Hydro-meteorological Satellite Ionospha-M N1 ROSKOSMOS / ROSHYDROMET | Planned | 31 Mar 2023 | 31 Dec 2027 | Hydrometeorology, heliogeophysics, climatology. | | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| Ionospha-M N2 Hydro-meteorological Satellite Ionospha-M N2 ROSKOSMOS / ROSHYDROMET | Planned | 31 Mar 2023 | 31 Dec 2027 | Hydrometeorology, heliogeophysics, climatology. | | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| Ionospha-M N3 Hydro-meteorological Satellite Ionospha-M N3 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2023 | 31 Dec 2028 | Hydrometeorology, heliogeophysics, climatology. | | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| Ionospha-M N4 Hydro-meteorological Satellite Ionospha-M N4 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2023 | 31 Dec 2028 | Hydrometeorology, heliogeophysics, climatology. | | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: |
| Jason-3 EUMETSAT / NOAA / CNES / NASA | Operational (extended) | 17 Jan 2016 | 01 Oct 2025 | 3-year nominal mission lifetime, 5-year extended lifetime. Physical oceanography, geodesy/gravity, climate monitoring, marine meteorology. | LRA, DORIS-NG, AMR, GPSP, POSEIDON-3B Altimeter | Type: Inclined, non-sun-synchronous Altitude: 1343 km Period: 112.4 min Inclination: 68.05 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL: http://sealevel.jpl.nasa.gov/missions/jason3/ |
| JPSS-1 Joint Polar Satellite System - 1 NOAA / EUMETSAT / NASA | Operational (nominal) | 18 Nov 2017 | 30 Jun 2027 | Meteorological, climatic, terrestrial, oceanographic, and solar-geophysical applications; global and regional environmental monitoring, search and rescue, data collection. | CHS, CERES, VIIRS, ATMS, OMPS | Type: Sun-synchronous Altitude: 833 km Period: 101.5 min Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.jpss.noaa.gov |
| JPSS-2 Joint Polar Satellite System - 2 NOAA / EUMETSAT / NASA | Commissioning | 10 Nov 2022 | 30 Nov 2028 | 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. | CHS, VIIRS, ATMS, OMPS, OMPS-L | Type: Sun-synchronous Altitude: 833 km Period: 101.5 min Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.jpss.noaa.gov |
| JPSS-3 Joint Polar Satellite System - 3 (Polar Follow-on) NOAA / EUMETSAT / NASA | Planned | 30 Nov 2026 | 30 Nov 2033 | 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. Instrument complement for JPSS-3 and JPSS-4 remains TBD. | CHS, VIIRS, ATMS, OMPS, OMPS-L, Libera | Type: Sun-synchronous Altitude: 833 km Period: 101.5 min Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.jpss.noaa.gov |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|--|----------------------------------|---|
| JPSS-4 Joint Polar Satellite System - 4 (Polar Follow-On) NOAA / EUMETSAT / NASA | Planned | 30 Nov 2031 | 30 Nov 2038 | 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-DCSA and SARSAT instruments, though these are considered part of the JPSS system. Instrument complement for JPSS-3 and JPSS-4 remains TBD. | CrIS, VIIRS, ATMS, OMP, OMP-S, L | Type: Sun-synchronous Altitude: 833 km Period: 101.5 min Inclination: 98.75 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.jpss.noaa.gov |
| Kanopus-V N3 Environmental Satellite Kanopus-V N3 ROSKOSMOS | Operational (nominal) | 01 Feb 2018 | 01 Feb 2023 | Disaster monitoring, forest fire detection, land surface, environmental monitoring. | PSS, MSS | Type: Sun-synchronous Altitude: 510 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: Longitude (if geo): Asc/desc: Ascending URL: http://eng.ntsomz.ru/ks_dzz/satellites ; http://planet.itip.ru |
| Kanopus-V N4 Environmental Satellite Kanopus-V N4 ROSKOSMOS | Operational (nominal) | 01 Feb 2018 | 01 Feb 2023 | Disaster monitoring, forest fire detection, land surface, environmental monitoring. | PSS, MSS | Type: Sun-synchronous Altitude: 510 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: Longitude (if geo): Asc/desc: Ascending URL: http://eng.ntsomz.ru/ks_dzz/satellites ; http://planet.itip.ru |
| Kanopus-V N5 Environmental Satellite Kanopus-V N5 ROSKOSMOS | Operational (nominal) | 27 Dec 2018 | 27 Dec 2023 | Disaster monitoring, forest fire detection, land surface, environmental monitoring. | PSS, MSS | Type: Sun-synchronous Altitude: 510 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: Longitude (if geo): Asc/desc: Ascending URL: http://eng.ntsomz.ru/ks_dzz/satellites ; http://planet.itip.ru |
| Kanopus-V N6 Environmental Satellite Kanopus-V N6 ROSKOSMOS | Operational (nominal) | 27 Dec 2018 | 27 Dec 2023 | Disaster monitoring, forest fire detection, land surface, environmental monitoring. | PSS, MSS | Type: Sun-synchronous Altitude: 510 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: Longitude (if geo): Asc/desc: Ascending URL: http://eng.ntsomz.ru/ks_dzz/satellites ; http://planet.itip.ru |
| Kanopus-V IR N2 Environmental Satellite Kanopus-V IR N2 ROSKOSMOS | Operational (extended) | 14 Jul 2017 | 31 Dec 2022 | Disaster monitoring, forest fire detection, land surface, environmental monitoring. | PSS, MSS, MSU-IK-SR | Type: Sun-synchronous Altitude: 510 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 5 days LST: Longitude (if geo): Asc/desc: Ascending URL: http://eng.ntsomz.ru/ks_dzz/satellites ; http://planet.itip.ru |
| KhalifaSat MBRSC / UAE SA | Operational (nominal) | 29 Oct 2018 | 29 Oct 2023 | KhalifaSat is the first satellite to be manufactured in the clean rooms at MBRSC space technology labs in Dubai. KhalifaSat will provide high-quality images at a resolution of 70 cm for a variety of uses. The main objectives of the KhalifaSat mission are to: develop a sub-meter resolution small satellite system to be used for global imaging and download; establish the necessary infrastructure for the development of the satellites in the UAE; and, contribute locally and internationally with value-added products and services derived from KhalifaSat images. | KHCS | Type: Sun-synchronous Altitude: 613 km Period: Inclination: 97.13 deg Repeat cycle: 8 days LST: 13:30:00 Longitude (if geo): Asc/desc: Descending URL: https://mbpsc.ae/en/page/khalifa-sat |
| KOMPSAT-2 Korea Multi-Purpose Satellite -2 KARI / ASTRUM / E-LOP | Operational (extended) | 27 Jul 2006 | 31 Dec 2022 | Cartography, land use and planning, disaster monitoring. | MSC | Type: Sun-synchronous Altitude: 685 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: http://komsat.kari.re.kr/english/index.asp |
| KOMPSAT-3 Korea Multi-Purpose Satellite -3 KARI / ASTRUM | Operational (extended) | 18 May 2012 | 18 May 2023 | Cartography, land use and planning, disaster monitoring. | AEISS | Type: Sun-synchronous Altitude: 685 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: http://komsat.kari.re.kr/english/index.asp |
| KOMPSAT-3A Korea Multi-Purpose Satellite -3A KARI | Operational (nominal) | 26 Mar 2015 | 26 Mar 2023 | Cartography, land use and planning, disaster monitoring. | AEISS-A | Type: Sun-synchronous Altitude: 528 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: http://komsat.kari.re.kr/english/index.asp |
| KOMPSAT-5 Korea Multi-Purpose Satellite -5 KARI / TASA | Operational (nominal) | 22 Aug 2013 | 22 Aug 2023 | Cartography, land use and planning, disaster monitoring. | COSI | Type: Sun-synchronous Altitude: 550 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: http://komsat.kari.re.kr/english/index.asp |
| KOMPSAT-6 Korea Multi-Purpose Satellite -6 KARI | Approved | 31 Dec 2023 | 15 Oct 2027 | Cartography, land use and planning, disaster monitoring | TBD | Type: Sun-synchronous Altitude: 550 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: http://komsat.kari.re.kr/english/index.asp |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|---|-----------------|---|
| KOMPSAT-7 Korea Multi-Purpose Satellite -7 KARI / KAI | Approved | 15 Sep 2023 | 15 Sep 2027 | Cartography, land use and planning, disaster monitoring | AEISS-HR | Type: Sun-synchronous Altitude: 685 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50 Longitude (if geo): Asc/desc: Ascending URL: http://kompsat.kari.re.kr/english/index.asp |
| KOMPSAT-7A Korea Multi-Purpose Satellite -7A KARI / KAI | Approved | 15 Sep 2025 | 15 Sep 2029 | Cartography, land use and planning, disaster monitoring | AEISS-HRA | Type: Sun-synchronous Altitude: 685 km Period: 98.5 min Inclination: 98.1 deg Repeat cycle: 28 days LST: 10:50:00 Longitude (if geo): Asc/desc: Ascending URL: http://kompsat.kari.re.kr/english/index.asp |
| Kondor-FKA N1 SAR Satellite Kondor-FKA N1 ROSKOSMOS | Approved | 08 Dec 2022 | 31 Dec 2027 | Disaster monitoring, sea surface monitoring, information support of environmental management | BRLK S-range | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: http://www.npomash.ru/activities/en/space1.htm |
| Kondor-FKA N2 SAR Satellite Kondor-FKA N2 ROSKOSMOS | Planned | 31 Dec 2023 | 31 Dec 2028 | Disaster monitoring, sea surface monitoring, information support of environmental management | BRLK S-range | Type: TBD Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: http://www.npomash.ru/activities/en/space1.htm |
| LAGEOS-1 Laser Geodynamics Satellite - 1 NASA / ASI | Operational (nominal) | 04 May 1976 | 04 May 2052 | Geodesy, crustal motion and gravity field measurements by laser ranging. | LRA (LAGEOS) | Type: Inclined, non-sun-synchronous Altitude: 5900 km Period: 226 min Inclination: 110 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: http://www.asi.it |
| LAGEOS-2 Laser Geodynamics Satellite - 2 ASI / NASA | Operational (nominal) | 22 Oct 1992 | 22 Oct 2052 | Geodesy, crustal motion and gravity field measurements by laser ranging. | LRA (LAGEOS) | Type: Inclined, non-sun-synchronous Altitude: 5800 km Period: 223 min Inclination: 52.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: http://www.asi.it |
| Landsat 7 USGS / NASA | Operational (extended) | 15 Apr 1999 | 30 Sep 2025 | Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover. 5-year nominal mission life, currently in extended operations with the LST allowed to drift. Routine science mission data operations will end upon the declaration of successful Landsat-9 operations, currently targeted for early January 2022. Landsat-7's orbit will be lowered to accommodate a potential OSAM-1 servicing mission in the 2025 timeframe. | ETM+ | Type: Sun-synchronous Altitude: 697 km Period: 98.9 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 9:00:00 Longitude (if geo): Asc/desc: Descending URL: https://www.usgs.gov/landsat-missions/landsat-7 ; https://landsat.gsfc.nasa.gov/satellites/landsat-7/ |
| Landsat 8 USGS / NASA | Operational (extended) | 11 Feb 2013 | 30 May 2023 | 5-year mission design life with at least 10 years of consumables. 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: 98.9 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:11 Longitude (if geo): Asc/desc: Descending URL: https://www.usgs.gov/core-science-systems/nli/landsat/landsat-8 , https://landsat.gsfc.nasa.gov/landsat-8/ |
| Landsat 9 USGS / NASA | Operational (nominal) | 27 Sep 2021 | 30 Sep 2026 | 5-year mission design life with at least 10 years of consumables. Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover. | TIRS-2, OLI-2 | Type: Sun-synchronous Altitude: 705 km Period: 98.9 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:11 Longitude (if geo): Asc/desc: Descending URL: https://www.usgs.gov/core-science-systems/nli/landsat/landsat-9 , https://landsat.gsfc.nasa.gov/landsat-9/ |
| Landsat-Next NASA / USGS | Planned | 31 Dec 2030 | 31 Dec 2035 | 5-year mission design life with at least 10 years of consumables. Earth resources, land surface, environmental monitoring, agriculture and forestry, disaster monitoring and assessment, ice and snow cover. | LandIS | Type: Sun-synchronous Altitude: Period: 98 min Inclination: 98 deg Repeat cycle: 9 days LST: 10:10 Longitude (if geo): Asc/desc: Descending URL: https://landsat.gsfc.nasa.gov/satellites/landsat-next/ |
| LARES LAser RElativity Satellite ASI | Operational (nominal) | 13 Feb 2012 | 13 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. | LCORA | Type: Inclined, non-sun-synchronous Altitude: 1450 km Period: 99.1 min Inclination: 71 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://www.lares-mission.com/ |
| LARES-2 LAser RElativity Satellite 2 ASI | Commissioning | 13 Jul 2022 | 01 Mar 2062 | Scientific objectives are the high accuracy 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 an accuracy greatly improved with respect to the previous LAGEOS and LARES missions. Gravitomagnetic field and dragging of inertial frames are predictions of Einstein's theory of General Relativity. In addition, LARES-2 will allow other measurements in General Relativity, geodesy and geodynamics. | LCORA (LARES-2) | Type: Inclined, non-sun-synchronous Altitude: 5892 km Period: 226 min Inclination: 70 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://www.lares-mission.com/LARES_2.asp |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|--|--|
| Light-1 UAE SA / Khalifa University / NYUAD | Operational (nominal) | 21 Dec 2021 | 31 Dec 2023 | Light-1 is a 3U CubeSat satellite mission to study Terrestrial Gamma-ray Flashes (TGFs), upward directed bursts of X-rays and gamma-rays associated with thunderstorm activity. The mission will be based on an original detector design being developed at New York University Abu Dhabi (NYUAD). | TGF Detectors | Type: Inclined, non-sun-synchronous Altitude: 400 km Period: 90 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| LIS-on-ISS International Space Station/Lightning Imaging Sensor NASA | Operational (extended) | 19 Feb 2017 | 30 Sep 2023 | Spare LIS unit from the TRMM mission. NASA selected the LIS spare hardware to fly to the space station in order to take advantage of the orbiting laboratory's high inclination. Will monitor global lightning for Earth science studies, provide cross-sensor calibration and validation with other space-borne instruments, and ground-based lightning networks. LIS will also supply real-time lightning data over data-sparse regions, such as oceans, to support operational weather forecasting and warning. | LIS Copy | Type: Inclined, non-sun-synchronous Altitude: 405 km Period: 90 min Inclination: 51 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: http://lightning.nsstc.nasa.gov/lis/ |
| LOTUSat 1 VAST | Planned | 01 Mar 2023 | 01 Mar 2028 | Natural hazard prevention | LOTUSat 1 SAR | Type: Sun-synchronous Altitude: 505 km Period: Inclination: 97 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| MAIA Multi-Angle Imager for Aerosols NASA / U.S. AID / U.S. DoS | Approved | 31 Oct 2024 | 31 Oct 2027 | To determine associations between different types of airborne particulate matter and adverse human health outcomes. | MAIA | Type: Sun-synchronous Altitude: 740 km Period: 100 min Inclination: 98.4 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: https://maia.jpl.nasa.gov/ |
| MDASat-1a SANSa / CPUT | Operational (nominal) | 13 Jan 2022 | 31 Dec 2024 | The MDASat-1 constellation is equipped with an improved automatic identification system (AIS) receiver from its predecessor, ZACube-2, using its SDR-based payload. MDASat-1 can receive messages on the AIS and AIS long range channels. | AIS Receiver (MDASat-1) | Type: Sun-synchronous Altitude: 550 km Period: Inclination: Repeat cycle: LST: 10:30:00 Longitude (if geo): Asc/desc: Ascending URL: |
| MDASat-1b SANSa / CPUT | Operational (nominal) | 13 Jan 2022 | 31 Dec 2024 | The MDASat-1 constellation is equipped with an improved automatic identification system (AIS) receiver from its predecessor, ZACube-2, using its SDR-based payload. MDASat-1 can receive messages on the AIS and AIS long range channels. | AIS Receiver (MDASat-1) | Type: Sun-synchronous Altitude: 550 km Period: Inclination: Repeat cycle: LST: 10:30:00 Longitude (if geo): Asc/desc: Ascending URL: |
| MDASat-1c SANSa / CPUT | Operational (nominal) | 13 Jan 2022 | 31 Dec 2024 | The MDASat-1 constellation is equipped with an improved automatic identification system (AIS) receiver from its predecessor, ZACube-2, using its SDR-based payload. MDASat-1 can receive messages on the AIS and AIS long range channels. | AIS Receiver (MDASat-1) | Type: Sun-synchronous Altitude: 550 km Period: Inclination: Repeat cycle: LST: 10:30:00 Longitude (if geo): Asc/desc: Ascending URL: |
| MERLIN Methane Remote Sensing Lidar Mission CNES / DLR | Approved | 15 Feb 2028 | 15 Feb 2031 | Global atmospheric methane concentration. | IPDA LIDAR | Type: Sun-synchronous Altitude: 500 km Period: 90 min Inclination: Repeat cycle: 28 days LST: 6:00 or 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.dlr.de/rd/desktopdefault.aspx/tabid-2440/3586_read-31672/ |
| Meteor-M N2 Meteorological Satellite Meteor-M N2 ROSKOSMOS / ROSHYDROMET | Operational (extended) | 08 Jul 2014 | 31 Dec 2022 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS-2, MSU-MR, DCS, KMSS, GGAK-M, Severjanin | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: 1 days LST: 9:30 Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru; http://eng.ntsomz.ru/ks_dzz/satellites; |
| Meteor-M N2-2 Meteorological Satellite Meteor-M N2-2 ROSKOSMOS / ROSHYDROMET | Operational (nominal) | 05 Jul 2019 | 30 Mar 2024 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS, MSU-MR, DCS, KMSS, GGAK-M, BRK | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru; http://eng.ntsomz.ru/ks_dzz/satellites; |
| Meteor-M N2-3 Meteorological Satellite Meteor-M N2-3 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2023 | 31 Dec 2027 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS, MSU-MR, DCS, KMSS, GGAK-M, BRK | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru; http://eng.ntsomz.ru/ks_dzz/satellites; |
| Meteor-M N2-4 Meteorological Satellite Meteor-M N2-4 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2023 | 31 Dec 2028 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS, MSU-MR, DCS, KMSS, GGAK-M, BRK | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru; http://eng.ntsomz.ru/ks_dzz/satellites; |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|--|---|--|
| Meteor-M N2-5 Meteorological Satellite Meteor-M N2-5 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2024 | 31 Dec 2029 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS, MSU-MR, DCS, KMSS, GGAK-M, BRK | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru ; http://eng.ntsomz.ru/ks_dzz/satellites ; |
| Meteor-M N2-6 Meteorological Satellite Meteor-M N2-6 ROSKOSMOS / ROSHYDROMET | Planned | 31 Dec 2025 | 31 Dec 2030 | Hydrometeorology, climatology, heliogeophysics, Earth resources and environmental monitoring. | MTVZA, IKFS, MSU-MR, DCS, KMSS, GGAK-M, BRK | Type: Sun-synchronous Altitude: 832 km Period: 101 min Inclination: 98.77 deg Repeat cycle: LST: TBD Longitude (if geo): Asc/desc: Ascending URL: http://planet.itp.ru ; http://eng.ntsomz.ru/ks_dzz/satellites ; |
| Meteor-MP N1 Meteor-MP Meteorological Satellite N1 ROSHYDROMET | Planned | 31 Dec 2026 | 31 Dec 2030 | 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: http://planet.itp.ru |
| Meteor-MP N2 Meteor-MP Meteorological Satellite N2 ROSHYDROMET | Planned | 31 Dec 2027 | 31 Dec 2031 | 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: http://planet.itp.ru |
| Meteor-MP N3 Meteor-MP Meteorological Satellite N3 ROSHYDROMET | Planned | 31 Dec 2028 | 31 Dec 2032 | 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: http://planet.itp.ru |
| Meteosat-8 Meteosat Second Generation-1 EUMETSAT / ESA | Operational (extended) | 28 Aug 2002 | 04 Oct 2022 | 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-8's original deployment at 0 degrees ended in July 2016. It is now deployed at 41.5 degrees east in support of the Indian Ocean Data Coverage (IODC) service, and from 1 July 2022 it will only be on standby at that location. | MSG Comms, SEVIRI, GERB | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: 0.1 deg Repeat cycle: LST: Longitude (if geo): 41.5 deg Asc/desc: NA URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?fen? https://www.eumetsat.int/indian-ocean-data-coverage-iodc |
| Meteosat-9 Meteosat Second Generation-2 EUMETSAT / ESA | Operational (nominal) | 22 Dec 2005 | 01 Jan 2025 | 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: 35779 km Period: 1436 min Inclination: 6 deg Repeat cycle: LST: Longitude (if geo): 45.5 deg Asc/desc: NA URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?fen? |
| Meteosat-10 Meteosat Second Generation-3 EUMETSAT / ESA | Operational (nominal) | 05 Jul 2012 | 01 Sep 2030 | 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: 35779 km Period: 1436 min Inclination: 1.5 deg Repeat cycle: LST: Longitude (if geo): 9.5 deg Asc/desc: NA URL: http://www.eumetsat.int/website/home/Data/DataDelivery/DataRegistration/index.html |
| Meteosat-11 Meteosat Second Generation-4 EUMETSAT / ESA | Operational (nominal) | 15 Jul 2015 | 01 Dec 2033 | 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: 35779 km Period: 1436 min Inclination: 0 deg Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: NA URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?fen? |
| Metop-B Meteorological Operational Polar Satellite - B EUMETSAT / NOAA / CNES / ESA | Operational (nominal) | 17 Sep 2012 | 31 Aug 2024 | Meteorology, climatology. Due to a hardware problem on the Metop-B satellite, the A-DCS3 instrument is only supporting an ARGOS-2 service. | SEM (POES), ARGOS, S&R (NOAA), MHS, IASI, GRAS, GOME-2, ASCAT, AMSU-A, AVHRR/3, HIRS/4 | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Data/DataDelivery/DataRegistration/index.html |
| Metop-C Meteorological Operational Polar Satellite - C EUMETSAT / NOAA / CNES / ESA | Operational (nominal) | 07 Nov 2018 | 31 Dec 2027 | Meteorology, climatology. | SEM (POES), A-DCS3, MHS, IASI, GRAS, GOME-2, ASCAT, AMSU-A, AVHRR/3 | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Data/DataDelivery/DataRegistration/index.html |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|-----------------------|-------------|-------------|---|---|---|
| METOP-SG A1 EUMETSAT Polar System, Second Generation EUMETSAT / DLR / COM / CNES / ESA | Approved | 31 Dec 2024 | 30 Jun 2032 | Meteorology, climatology. EPS-SG-a carries the Sentinel-5 mission. 3 satellites. | ME Timage, UVNS (Sentinel-5), IASI-NG, 3MI, RO, MWS | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| METOP-SG A2 EUMETSAT Polar System, Second Generation EUMETSAT / DLR / COM / CNES / ESA | Approved | 31 Dec 2031 | 30 Jun 2039 | Meteorology, climatology. EPS-SG-a carries the Sentinel-5 mission. 3 satellites. | ME Timage, UVNS (Sentinel-5), IASI-NG, 3MI, RO, MWS | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| METOP-SG A3 EUMETSAT Polar System, Second Generation EUMETSAT / DLR / COM / CNES / ESA | Approved | 31 Dec 2038 | 30 Jun 2046 | Meteorology, climatology. EPS-SG-a carries the Sentinel-5 mission. 3 satellites. | ME Timage, UVNS (Sentinel-5), IASI-NG, 3MI, RO, MWS | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| METOP-SG B1 EUMETSAT Polar System, Second Generation EUMETSAT / CNES / ESA | Approved | 31 Mar 2025 | 30 Sep 2032 | Meteorology, climatology. 3 satellites. | ARGOS-4, RO, MWI, SCA, ICI | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| METOP-SG B2 EUMETSAT Polar System, Second Generation EUMETSAT / CNES / ESA | Approved | 31 Mar 2032 | 30 Sep 2039 | Meteorology, climatology. 3 satellites. | ARGOS-4, RO, MWI, SCA, ICI | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| METOP-SG B3 EUMETSAT Polar System, Second Generation EUMETSAT / CNES / ESA | Approved | 31 Mar 2039 | 30 Sep 2046 | Meteorology, climatology. 3 satellites. | A-DCS4, RO, MWI, SCA, ICI | Type: Sun-synchronous Altitude: 824 km Period: 101.4 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 9:30 Longitude (if geo): Asc/desc: Descending URL: http://www.eumetsat.int/website/home/Satellites/FutureSatellites/EUMETSATPolarSystemSecondGeneration/index.html |
| MeznSat UAE SA / American University of Ras Al Khaimah / Khalifa University | Operational (nominal) | 28 Sep 2020 | 31 Dec 2023 | MeznSat is a 3U CubeSat to be developed, built and tested primarily by university students to detect Greenhouse Gas (GHG) concentrations. | ARGUS 2000 | Type: Sun-synchronous Altitude: 500 km Period: 90 min Inclination: 97 deg Repeat cycle: 2 days LST: 12:00:00 Longitude (if geo): Asc/desc: URL: |
| MicroCarb CNES / UKSA | Approved | 31 Dec 2023 | 31 Dec 2027 | The objective of the MicroCarb mission being to measure the CO2 concentration with extreme precision (of the order of 1 ppm, which is 0.3 %). | Microcarb | Type: Sun-synchronous Altitude: 650 km Period: Inclination: Repeat cycle: 21 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: https://microcarb.cnes.fr/en/MICROCARB/GP_mission.htm |
| MicroDragon VAST / Keio University | Operational (nominal) | 18 Jan 2019 | 31 Dec 2022 | Aquaculture support | MicroDragon SMI & TPI | Type: Sun-synchronous Altitude: 511 km Period: Inclination: 97 deg Repeat cycle: LST: 9:30 Longitude (if geo): Asc/desc: URL: |
| MTG-1 (imaging) Meteosat Third Generation - Imaging Satellite 1 EUMETSAT / ESA | Approved | 30 Nov 2022 | 31 May 2031 | Meteorology, climatology, atmospheric dynamics/water and energy cycles. | FCI, LI, TIRS | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/DataAccess/index.htm?#en |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|--|--|
| MTG-12 (imaging) Meteosat Third Generation - Imaging Satellite 2 EUMETSAT / ESA | Approved | 30 Sep 2025 | 31 Mar 2034 | Meteorology, climatology, atmospheric dynamics/water and energy cycles. | FCI, LI | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?l=en |
| MTG-13 (imaging) Meteosat Third Generation - Imaging Satellite 3 EUMETSAT / ESA | Approved | 31 Dec 2030 | 30 Jun 2039 | Meteorology, climatology, atmospheric dynamics/water and energy cycles. | FCI, LI | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?l=en |
| MTG-14 (imaging) Meteosat Third Generation - Imaging Satellite 4 EUMETSAT / ESA | Approved | 30 Jun 2033 | 31 Dec 2041 | Meteorology, climatology, atmospheric dynamics/water and energy cycles. | FCI, LI | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?l=en |
| MTG-S1 (sounding) Meteosat Third Generation S1 Sounding Satellite 1 EUMETSAT / COM / ESA | Approved | 30 Jun 2024 | 31 Dec 2032 | Supporting European atmospheric composition and air quality monitoring services. MTG S1 carries the Sentinel-4 A mission. | UVN, IRS | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/DataAccess/index.htm?l=en |
| MTG-S2 (sounding) Meteosat Third Generation S2 Sounding Satellite 2 EUMETSAT / COM / ESA | Approved | 30 Jun 2032 | 31 Dec 2040 | Supporting European atmospheric composition and air quality monitoring services. MTG S2 carries the Sentinel-4 B mission. | UVN, IRS | Type: Geostationary Altitude: 35779 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.eumetsat.int/Home/Main/Satellites/index.htm?l=en |
| NigeriaSat-2 Nigeria Earth Observation Satellite 2 NASRDA | Operational (extended) | 17 Aug 2011 | 31 Dec 2022 | Small satellite mission with technical and scientific objectives (environmental) monitoring. | NigeriaSat Medium and High Resolution | Type: Sun-synchronous Altitude: 700 km Period: 97 min Inclination: 98 deg Repeat cycle: 4 days LST: Longitude (if geo): Asc/desc: Descending URL: http://www.nasrda.gov.ng |
| NigeriaSat-X Nigeria Earth Observation Satellite X NASRDA | Operational (extended) | 17 Aug 2011 | 31 Dec 2022 | Small satellite mission with technical and scientific objectives (capability demonstration). | NigeriaSat Medium Resolution | Type: Sun-synchronous Altitude: 700 km Period: 97 min Inclination: 98 deg Repeat cycle: LST: 10:15 Longitude (if geo): Asc/desc: Descending URL: http://www.nasrda.gov.ng |
| NISAR NASA ISRO Synthetic Aperture Radar NASA / ISRO | Approved | 30 Sep 2023 | 30 Sep 2026 | 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, S-band SAR | Type: Sun-synchronous Altitude: 747 km Period: 100 min Inclination: 98.4 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Descending URL: http://nisar.jpl.nasa.gov |
| NOAA-18 National Oceanic and Atmospheric Administration - 18 NOAA | Operational (extended) | 20 May 2005 | 01 Oct 2024 | 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. The EOL date is based on a reliability and health & status analysis; the date shown is at the 60% confidence level. | 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 min Inclination: 98.75 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.ospo.noaa.gov/Operations/POES/index.html |
| NOAA-19 National Oceanic and Atmospheric Administration - 19 NOAA | Operational (nominal) | 04 Feb 2009 | 01 Oct 2024 | 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. The EOL date is based on a reliability and health & status analysis; the date shown is at the 60% confidence level. | SEM (POES), ARGOS-3, S&R (NOAA), MHS, AMSU-A, SBUV/2, AVHRR/3, NOAA Comms, HIRS/4, ARGOS-4, LRIT | Type: Sun-synchronous Altitude: 870 km Period: 102.1 min Inclination: 98.75 deg Repeat cycle: LST: 14:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.ospo.noaa.gov/Operations/POES/index.html |
| NORSAT-1 NOSA | Operational (extended) | 14 Jul 2017 | 31 Dec 2022 | Enhanced AIS performance; total solar irradiance; langmuir probe | AIS, Langmuir Probe, TSI | Type: Sun-synchronous Altitude: 586 km Period: 96.5 min Inclination: 97.6 deg Repeat cycle: LST: 11:50:00 Longitude (if geo): Asc/desc: Descending URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|--|---|
| NORSAT-2 NOSA | Operational (extended) | 14 Jul 2017 | 31 Dec 2022 | The satellite carries multiple antennas for reception of AIS signals. It also contains equipment for testing of VDES (VHF data exchange system). | AIS, VDES Test Mission | Type: Sun-synchronous Altitude: 585 km Period: 96.5 min Inclination: 97.6 deg Repeat cycle: LST: 11:55:00 Longitude (if geo): Asc/desc: Descending URL: |
| NORSAT-3 NOSA / NDRE | Operational (nominal) | 29 Apr 2021 | 29 Apr 2024 | Reception of AIS signals, in addition to a test mission (NRD) detecting maritime navigation radars | AIS, NRD Test Mission | Type: Sun-synchronous Altitude: 605 km Period: 97 min Inclination: 97.8 deg Repeat cycle: LST: 22:30:00 Longitude (if geo): Asc/desc: Descending URL: |
| NORSAT-4 NOSA / NDRE | Approved | 01 Oct 2023 | 01 Oct 2026 | Reception of AIS signals, in addition to a test mission performing vessel detection in low light conditions | AIS, LLI | Type: Sun-synchronous Altitude: 550 km Period: 97 min Inclination: 97.6 deg Repeat cycle: LST: 18:00:00 Longitude (if geo): Asc/desc: Descending URL: |
| NORSAT-TD NeoSat-Technology Demonstrator NOSA / NSO / ASI / CNES | Approved | 15 Feb 2023 | 15 Feb 2026 | Perform 2-way VHF Data Exchange maritime communication, demonstrate a pseudo-constellation of VDES satellites. Demonstrate VDES enabled maritime navigation and GNSS integrity monitoring through distribution of Precision Timing for UTC and pseudo-ranging. Collect Automatic Identification System (AIS) messages from a high-performance CubeSat AIS/IoT receiver. Demonstrate a robust optical laser communications with an experimental CubeSat terminal. Perform collision avoidance and satellite operations with a new iodine ion thruster. Support Satellite Laser Ranging with a new miniaturized reflector. Verify sub-decimeter augmented GPS positioning in real-time with CubeSat receiver | VDES, AIS/IOT, CORA-micro, SmallCat, SpaceStar | Type: Sun-synchronous Altitude: 500 km Period: 94.6 min Inclination: 97.4 deg Repeat cycle: LST: 22:30:00 Longitude (if geo): Asc/desc: Descending URL: |
| NovaSAR-1 UKSA / CSIRO / ISRO / DOST-ASTI / Space-Eyes | Operational (nominal) | 16 Sep 2018 | 31 Dec 2026 | NovaSAR-1 is a low cost spaceborne Synthetic Aperture Radar (SAR) programme employing a novel small satellite design capable of supporting the requirements of a high performance SAR payload. The main applications include maritime and forestry. It has a secondary AIS payload. | S-band SAR, AIS | Type: Sun-synchronous Altitude: 583 km Period: 96.3 min Inclination: 97.7 deg Repeat cycle: 16 days LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.sstl.co.uk |
| Obzor-R N1 SAR Operative Monitoring Satellite Obzor-R N1 ROSKOSMOS | Approved | 30 Jun 2023 | 31 Dec 2027 | Operative Earth and disaster monitoring. | BRK X-range | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: 2 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roscosmos.ru/ |
| OCEANSAT-2 Ocean Satellite-2 ISRO | Operational (extended) | 24 Sep 2009 | 31 Dec 2023 | Ocean and atmosphere applications. | OCM, Scatterometer (OCEANSAT-2), ROSA | Type: Sun-synchronous Altitude: 720 km Period: 99.31 min Inclination: 98.28 deg Repeat cycle: 2 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| OCEANSAT-3 Ocean Satellite-3 ISRO | Approved | 30 Nov 2022 | 30 Nov 2027 | Ocean and atmosphere applications. | ARGOS-4, SSTM-1 (Oceansat-3), OCM (Oceansat-3), Scatterometer (Oceansat-3) | Type: Sun-synchronous Altitude: 720 km Period: 99.31 min Inclination: 98.28 deg Repeat cycle: 2 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| OCEANSAT-3A Ocean Satellite-3A ISRO | Approved | 01 Nov 2025 | 01 Nov 2030 | Ocean and atmosphere applications. | SSTM-1 (Oceansat-3), OCM (Oceansat-3) | Type: Sun-synchronous Altitude: 720 km Period: 99.31 min Inclination: 98.28 deg Repeat cycle: 2 days LST: 12:00 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| OCO-2 Orbiting Carbon Observatory-2 NASA | Operational (extended) | 02 Jul 2014 | 30 Sep 2023 | 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 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://ocov2.jpl.nasa.gov/ |
| OCO-3-on-ISS ISS/Orbiting Carbon Observatory-3 NASA | Operational (nominal) | 04 May 2019 | 30 Jan 2023 | High resolution carbon dioxide measurements to characterize sources and sinks on regional scales and quantify their variability over the seasonal cycle. | Spectrometer (OCO-3) | Type: Inclined, non-sun-synchronous Altitude: 417 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://ocov3.jpl.nasa.gov |
| Odin SNSA / TEKES / CNES / CSA / ESA | Operational (extended) | 20 Feb 2001 | 31 Dec 2023 | Atmospheric research, stratospheric ozone chemistry, mesospheric ozone science, summer mesospheric science. | OSIRIS, SMR | Type: Sun-synchronous Altitude: 570 km Period: 97.6 min Inclination: 97.65 deg Repeat cycle: LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.ohb-sweden.se/odin |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|---|--|
| PACE Plankton, Aerosol, Cloud, ocean Ecosystem NASA / NSO / SRON | Approved | 09 Jan 2024 | 09 Mar 2027 | Phase-2 DS mission, 3-year nominal mission. Aerosol and cloud profiles for climate and water cycle; ocean colour for open ocean biogeochemistry. | OCI, SPEKone, HARP-2 | Type: Sun-synchronous Altitude: 677 km Period: 98 min Inclination: 98 deg Repeat cycle: 16 days LST: 13:00 Longitude (if geo): Asc/desc: Ascending URL: https://pace.gsfc.nasa.gov |
| PAZ HISDESAT / CDTI / INTA | Operational (nominal) | 22 Feb 2018 | 22 Feb 2023 | Security, land use, urban management, environmental monitoring, risk management. | Paz SAR-X | Type: Sun-synchronous Altitude: 514 km Period: 95 min Inclination: 97.44 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.hisdesat.es |
| PhiSat-1 ESA / NSO | Operational (extended) | 03 Sep 2020 | 31 Dec 2022 | Demonstration of hyperspectral and thermal imaging on a 6U Cubesat. Demonstration of Artificial Intelligence accelerator. Cloud screening in-orbit will be the first AI application. Other applications are: high resolution by data fusion between hyperspectral and thermal; evapotranspiration and agriculture applications; thermal inertia and soil moisture; Urban Heat Island; assisting search and rescue for pyroclastic flow/surge deposits; oil spills; fire monitoring, underground fires; and, water quality. | HyperScout-2 | Type: Sun-synchronous Altitude: 540 km Period: 95 min Inclination: 98 deg Repeat cycle: LST: 10:30:00 Longitude (if geo): Asc/desc: Ascending URL: |
| Pleiades 1A CNES | Operational (extended) | 17 Dec 2011 | 31 Dec 2024 | 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: http://smsc.cnes.fr/PLEIADES/IR/index.htm |
| Pleiades 1B CNES | Operational (extended) | 02 Dec 2012 | 31 Dec 2024 | 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: http://smsc.cnes.fr/PLEIADES/IR/index.htm |
| PREFIRE Polar Radiant Energy in the Far InfraRed Experiment NASA | Approved | 31 Aug 2023 | 01 Sep 2024 | PREFIRE seeks to reduce uncertainty in polar energy fluxes, the processes that influence them, and, with improved modeling, the societal implications of polar climate change. Twin cubesats with identical long wave spectrometers. | TIRS (PREFIRE) | Type: Sun-synchronous Altitude: Period: 95 min Inclination: 98 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: https://prefire.ssec.wisc.edu/ |
| PRISMA PRecurso IperSpettrale della Missione Applicativa ASI | Operational (nominal) | 22 Mar 2019 | 30 Mar 2024 | 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 min Inclination: 97.9 deg Repeat cycle: 29 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: https://www.asi.it/en/earth-science/prisma/ |
| RADARSAT-2 CSA / MDA | Operational (nominal) | 14 Dec 2007 | 01 Apr 2024 | 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 min Inclination: 98.6 deg Repeat cycle: 24 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.asc-csa.gc.ca/eng/satellites/radarsat2/default.asp |
| RASAT RASAT Remote Sensing Satellite TUBITAK | Operational (extended) | 17 Aug 2011 | 31 Dec 2022 | Cartography, land cover/land use, city planning, disaster mitigation/monitoring, environmental monitoring. | RASAT VIS Panchromatic, RASAT VIS Multispectral | Type: Sun-synchronous Altitude: 685 km Period: 98.9 min Inclination: 98.21 deg Repeat cycle: 4 days LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.usayz.tubitak.gov.tr/ , http://blog.gezgin.gov.tr |
| RCM-1 RADARSAT CONSTELLATION MISSION-1 CSA / NRCAN / DND / DFO / AAFC / ECCC / PSC | Operational (nominal) | 12 Jun 2019 | 12 Oct 2026 | Ecosystem monitoring, maritime surveillance, disaster management. | SAR (RCM), AIS (RCM) | Type: Sun-synchronous Altitude: 600 km Period: 96.4 min Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp |
| RCM-2 RADARSAT CONSTELLATION MISSION-2 CSA / NRCAN / DND / DFO / AAFC / ECCC / PSC | Operational (nominal) | 12 Jun 2019 | 12 Oct 2026 | Ecosystem monitoring, maritime surveillance, disaster management. | SAR (RCM), AIS (RCM) | Type: Sun-synchronous Altitude: 600 km Period: 96.4 min Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp |
| RCM-3 RADARSAT CONSTELLATION MISSION-3 CSA / NRCAN / DND / DFO / AAFC / ECCC / PSC | Operational (nominal) | 12 Jun 2019 | 12 Oct 2026 | Ecosystem monitoring, maritime surveillance, disaster management. | SAR (RCM), AIS (RCM) | Type: Sun-synchronous Altitude: 600 km Period: 96.4 min Inclination: 97.7 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.asc-csa.gc.ca/eng/satellites/radarsat/default.asp |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|--|--|---|
| RESOURCESAT-2 Resource Satellite-2 ISRO | Operational (extended) | 20 Apr 2011 | 30 Jun 2023 | Natural resources management, agricultural applications, forestry, etc. | AWFS, LISS-IV, LISS-III (Resourcesat) | Type: Sun-synchronous Altitude: 817 km Period: 102 min Inclination: 98.72 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| RESOURCESAT-2A Resource Satellite-2A ISRO | Operational (nominal) | 07 Dec 2016 | 07 Dec 2023 | Natural resources management, agricultural applications, forestry, etc. | AWFS, LISS-IV, LISS-III (Resourcesat) | Type: Sun-synchronous Altitude: 817 km Period: 102 min Inclination: 98.72 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| RESOURCESAT-3 Resource Satellite-3 ISRO | Approved | 20 Nov 2025 | 20 Nov 2030 | Natural resources management, agricultural applications, forestry, etc. | ALISS III, ATCOR | Type: Sun-synchronous Altitude: 795 km Period: 101 min Inclination: 98.72 deg Repeat cycle: 11 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| RESOURCESAT-3A Resource Satellite-3A ISRO | Planned | 20 Nov 2026 | 20 Nov 2031 | Natural resources management, agricultural applications, forestry, etc. | ALISS III, ATCOR | Type: Sun-synchronous Altitude: 795 km Period: 101 min Inclination: 98.72 deg Repeat cycle: 11 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| RESOURCESAT-3S Resourcesat Sampler-3S ISRO | Approved | 22 Jun 2026 | 22 Jun 2031 | High-resolution DEM, geo-engineering, cadastral and sub-taluk-level applications. | APAN, LISS-V | Type: Sun-synchronous Altitude: 633 km Period: 97.5 min Inclination: 97.89 deg Repeat cycle: 48 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: |
| RESOURCESAT-3SA Resourcesat Sampler-3SA ISRO | Planned | 22 Jun 2027 | 22 Jun 2032 | High-resolution DEM, geo-engineering, cadastral and sub-taluk-level applications. | APAN, LISS-V | Type: Sun-synchronous Altitude: 633 km Period: 97.5 min Inclination: 97.89 deg Repeat cycle: 48 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: |
| Resurs-P N4 Environmental Satellite Resurs-P N4 ROSKOSMOS | Approved | 31 Dec 2023 | 31 Dec 2027 | Earth resources, environmental and disaster monitoring, cartography. | Geoton-L1 (2), GSA (1), SHMSA-SR, SHMSA-VR | Type: Sun-synchronous Altitude: 795 km Period: 94 min Inclination: 97.3 deg Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roskosmos.ru/ |
| Resurs-P N5 Environmental Satellite Resurs-P N5 ROSKOSMOS | Planned | 31 Dec 2023 | 31 Dec 2028 | Earth resources, environmental and disaster monitoring, cartography. | Geoton-L1 (2), GSA (1), SHMSA-SR, SHMSA-VR | Type: Sun-synchronous Altitude: 795 km Period: 94 min Inclination: 97.3 deg Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roskosmos.ru/ |
| Resurs-PM N1 Environmental Satellite Resurs-PM N1 ROSKOSMOS | Planned | 31 Dec 2023 | 31 Dec 2027 | Earth resources, environmental and disaster monitoring, cartography. | OEK VR, BIK-SD 1 | Type: Sun-synchronous Altitude: 475 km Period: 99 min Inclination: 98.2 deg Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roskosmos.ru/ |
| Resurs-PM N2 Environmental Satellite Resurs-PM N2 ROSKOSMOS | Planned | 31 Dec 2024 | 31 Dec 2028 | Earth resources, environmental and disaster monitoring, cartography. | OEK VR, BIK-SD 1 | Type: Sun-synchronous Altitude: 475 km Period: 99 min Inclination: 98.2 deg Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roskosmos.ru/ |
| Resurs-PM N3 Environmental Satellite Resurs-PM N3 ROSKOSMOS | Planned | 31 Dec 2025 | 31 Dec 2029 | Earth resources, environmental and disaster monitoring, cartography. | OEK VR, BIK-SD 1 | Type: Sun-synchronous Altitude: 720 km Period: 99 min Inclination: 98.2 deg Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: TBD URL: http://en.roskosmos.ru/ |
| RISAT-1A Radar Imaging Satellite ISRO | Operational (nominal) | 14 Feb 2022 | 14 Feb 2027 | 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 min Inclination: 97.844 deg Repeat cycle: 12 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: http://www.isro.org/ |
| RISAT-1B Radar Imaging Satellite ISRO | Planned | 20 Nov 2023 | 20 Nov 2028 | 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 min Inclination: 97.844 deg Repeat cycle: 12 days LST: 6:00 Longitude (if geo): Asc/desc: Descending URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|--|---|
| RISAT-2 Radar Imaging Satellite ISRO | Operational (extended) | 20 Apr 2009 | 31 Dec 2022 | For research and disaster management applications purpose. | SAR-X | Type: Sun-synchronous Altitude: 603 km Period: 07.6 min Inclination: 96 deg Repeat cycle: LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.isro.org/ |
| SAC-E/SABIA_MAR-1 Misión Satelital Argentina Brasileña para Información del Ambiente Marino CONAE / AEB | Planned | 28 Nov 2024 | 28 Nov 2029 | Ocean colour measurement (open ocean, coastal and in-land waters) (low & medium spatial resolution), SST, Sea & Coastal surveillance, urban lights, polar auroras, fires, data collection system. | DCS (SABIA_MAR), VIS-NIR, NIR-SWIR, MAC (HSC), Liulin-AR | Type: Sun-synchronous Altitude: 702 km Period: 99.8 min Inclination: 98.22 deg Repeat cycle: 9 days LST: 10:20 Longitude (if geo): Asc/desc: Descending URL: http://www.conae.gov.ar/ |
| SAC-E/SABIA_MAR-2 Misión Satelital Argentina Brasileña para Información del Ambiente Marino AEB / CONAE | Planned | 01 Nov 2025 | 02 Nov 2030 | Ocean colour measurement (open ocean, coastal and in-land waters) (low & medium spatial resolution), SST, Sea & Coastal surveillance, urban lights, polar auroras, fires, data collection system. | DCS (SABIA_MAR), VIS-NIR, NIR-SWIR, MAC (HSC), Liulin-AR | Type: Sun-synchronous Altitude: 702 km Period: 99.8 min Inclination: 98.22 deg Repeat cycle: 9 days LST: 10:20 Longitude (if geo): Asc/desc: Descending URL: http://www.conae.gov.ar/ |
| SAGE-III-on-ISS Stratospheric Aerosol and Gas Experiment (SAGE)-III/International Space Station (ISS) NASA | Operational (extended) | 19 Feb 2017 | 30 Sep 2026 | 1-year design life, 3-year Phase E goal. Refurbishment of the SAGE-III instrument and of a hexapod pointing platform, and accommodation studies. This mission flies on the ISS. Objective is to monitor the vertical distribution of aerosols, ozone, and other trace gases in the Earth's stratosphere and troposphere to enhance our understanding of ozone recovery and climate change processes in the upper atmosphere. Extended mission to 2026 awarded in 2020. | SAGE-III | Type: Inclined, non-sun-synchronous Altitude: 405 km Period: 90 min Inclination: 51 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: https://sage.nasa.gov/missions/about-sage-iii-on-iss/ |
| SAOCOM 1A Satélite Argentino de Observación Con Microondas 1A CONAE / ASI | Operational (nominal) | 07 Oct 2018 | 07 Oct 2023 | Earth observation and emergency management with an L-band SAR, soil moisture for agriculture and hydrology (main driver), interferometry. | SAR-L | Type: Sun-synchronous Altitude: 620 km Period: 97.2 min Inclination: 97.89 deg Repeat cycle: 16 days LST: 5:57:45 Longitude (if geo): Asc/desc: Ascending URL: http://www.conae.gov.ar/ |
| SAOCOM 1B Satélite Argentino de Observación Con Microondas 1B CONAE / ASI | Operational (nominal) | 30 Aug 2020 | 30 Aug 2025 | Earth observation and emergency management with an L-band SAR, soil moisture for agriculture and hydrology (main driver), interferometry. | SAR-L | Type: Sun-synchronous Altitude: 620 km Period: 97.2 min Inclination: 97.89 deg Repeat cycle: 16 days LST: 5:57:45 Longitude (if geo): Asc/desc: Ascending URL: http://www.conae.gov.ar/ |
| SAOCOM-2A Satélite Argentino de Observación Con Microondas 2A CONAE / ASI | Approved | 30 Aug 2028 | 15 Jan 2033 | Earth observation and emergency management with an L-band SAR. | SAR-L | Type: Sun-synchronous Altitude: 620 km Period: 97.2 min Inclination: 98 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.conae.gov.ar/ |
| SAOCOM-2B Satélite Argentino de Observación Con Microondas 2B CONAE / ASI | Approved | 31 Aug 2030 | 15 Jan 2035 | Earth observation and emergency management with an L-band SAR. | SAR-L | Type: Sun-synchronous Altitude: 620 km Period: 97.2 min Inclination: 98 deg Repeat cycle: 16 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.conae.gov.ar/ |
| SARAL Satellite with ARGOS and ALTIKa CNES / ISRO | Operational (extended) | 25 Feb 2013 | 31 Dec 2023 | This will provide precise, repetitive global measurements of sea surface height, significant wave heights and wind speed. | ARGOS, AltiKa | Type: Sun-synchronous Altitude: 798 km Period: 100.59 min Inclination: 98.55 deg Repeat cycle: 35 days LST: 18:00 Longitude (if geo): Asc/desc: Descending URL: http://smc.cnes.fr/SARAL/ |
| SBG-TIR Surface Biology and Geology (SBG) Thermal Infrared (TIR) Free Flyer NASA / ASI | Planned | 31 Dec 2026 | 31 Dec 2031 | Hyperspectral imager to provide information on terrestrial and aquatic ecosystems, hydrology, weather, climate, and solid Earth. | SBG TIR Instrument, VNIR Camera (SBG-TIR) | Type: Sun-synchronous Altitude: 665 km Period: 98.18 min Inclination: 98.05 deg Repeat cycle: LST: 12:30 Longitude (if geo): Asc/desc: Descending URL: https://sbg.jpl.nasa.gov |
| SBG-VSWIR Surface Biology and Geology (SBG) Visible and Short-Wave Infrared (VSWIR) Free Flyer NASA | Planned | 31 Dec 2028 | 31 Dec 2033 | Hyperspectral imager to provide information on terrestrial and aquatic ecosystems, hydrology, weather, climate, and solid Earth. | SBG VSWIR Instrument | Type: Sun-synchronous Altitude: 623 km Period: 97 min Inclination: Repeat cycle: 16 days LST: 11:00 Longitude (if geo): Asc/desc: Descending URL: https://sbg.jpl.nasa.gov |
| SCD-1 Data Collecting Satellite 1 INPE | Operational (extended) | 09 Feb 1993 | 31 Dec 2022 | Data collection and communication. | DCS | Type: Inclined, non-sun-synchronous Altitude: 750 km Period: 100 min Inclination: 25 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.inpe.br |
| SCD-2 Data Collecting Satellite 2 INPE | Operational (extended) | 23 Oct 1998 | 31 Dec 2022 | Data collection and communication. | DCS | Type: Inclined, non-sun-synchronous Altitude: 750 km Period: 100 min Inclination: 25 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: http://www.inpe.br |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|-----------------------|-------------|-------------|---|-------------------------------------|---|
| SCISAT-1 SCISAT-I/ACE CSA / ESA / NASA | Operational (nominal) | 12 Aug 2003 | 31 Mar 2024 | The SCISAT satellite has been in continuous spaceflight operation since 2003. It now measures over sixty (60) atmospheric species at still one of the world's highest vertical resolutions possible, and includes ozone, ozone depleting substances, all major greenhouse gases, and HFCs. Many of these species are measured by no other instrument or satellite world-wide, making Canada the sole provider of these datasets globally. As of 2021, the objectives of the mission remain to broadly assist in monitoring the UN Montreal Protocol, the Kigali Amendment, the Paris Climate Agreement, and the Canadian Environmental Protection Act. Specific objectives include to assess the quality of model predictions for: EC's UV forecasting system, atmospheric carbon transport, and climate-chemistry process studies. | ACE-FTS, MAESTRO | Type: Inclined, non-sun-synchronous Altitude: 650 km Period: 97.7 min Inclination: 74 deg Repeat cycle: 365 days LST: Longitude (if geo): Asc/desc: NA URL: http://www.asc-csa.gc.ca/eng/satellites/scisat/default.asp |
| Sentinel CHIME-A CHIME-A COM | Planned | 30 Sep 2028 | 31 Mar 2036 | To provide routine hyperspectral measurements in support of EU-and related policies for the management of natural resources & assets | HSI | Type: Sun-synchronous Altitude: 632 km Period: 97.5 min Inclination: 97.9 deg Repeat cycle: 25 days LST: 10:45 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/chime-copernicus#development-status |
| Sentinel CHIME-B CHIME-B COM | Planned | 15 Dec 2030 | 15 Jun 2038 | To provide routine hyperspectral measurements in support of EU-and related policies for the management of natural resources & assets | HSI | Type: Sun-synchronous Altitude: 632 km Period: 97.5 min Inclination: 97.9 deg Repeat cycle: 25 days LST: 10:45 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/chime-copernicus#development-status |
| Sentinel CIMR-A CIMR-A COM | Planned | 15 Jan 2029 | 16 Jul 2036 | To provide high-spatial resolution microwave imaging radiometry measurements and derived products with continuous global coverage and sub-daily revisit in the polar regions and adjacent seas, to address Copernicus user needs | Imaging Microwave Radiometer | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 06:00 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/cimr#eo-quick-facts-section |
| Sentinel CIMR-B CIMR-B COM | Planned | 31 Jan 2031 | 01 Aug 2038 | To provide high-spatial resolution microwave imaging radiometry measurements and derived products with continuous global coverage and sub-daily revisit in the polar regions and adjacent seas, to address Copernicus user needs | Imaging Microwave Radiometer | Type: Sun-synchronous Altitude: 830 km Period: 101 min Inclination: 98.7 deg Repeat cycle: 29 days LST: 06:00 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/cimr#eo-quick-facts-section |
| Sentinel CO2M-A CO2M-A COM / EUMETSAT | Approved | 15 Dec 2025 | 15 Jun 2033 | To provide Copernicus with a CO2 monitoring and verification support capacity, capable of estimating anthropogenic CO2 emissions at country and megacity scales. | CLIM, CO2I, MAP | Type: Sun-synchronous Altitude: 735 km Period: 99.5 min Inclination: 97.7 deg Repeat cycle: 11 days LST: 11:30 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/co2m |
| Sentinel CO2M-B CO2M-B COM / EUMETSAT | Approved | 31 Mar 2026 | 29 Sep 2033 | To provide Copernicus with a CO2 monitoring and verification support capacity, capable of estimating anthropogenic CO2 emissions at country and megacity scales. | CLIM, CO2I, MAP | Type: Sun-synchronous Altitude: 735 km Period: 99.5 min Inclination: 97.7 deg Repeat cycle: 11 days LST: 11:30 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/co2m |
| Sentinel CO2M-C CO2M-C COM | Planned | 31 Oct 2026 | 01 May 2034 | To provide Copernicus with a CO2 monitoring and verification support capacity, capable of estimating anthropogenic CO2 emissions at country and megacity scales. | CLIM, CO2I, MAP | Type: Sun-synchronous Altitude: 735 km Period: 99.5 min Inclination: 97.7 deg Repeat cycle: 11 days LST: 11:30 (at DN) Longitude (if geo): Asc/desc: Descending URL: https://www.eoportal.org/satellite-missions/co2m |
| Sentinel CRISTAL-A CRISTAL-A COM | Planned | 01 Apr 2028 | 01 Oct 2035 | To monitor critical climate signals: ice sheet, ice cap melting and sea level, as well as to monitor variability of Arctic and Southern Ocean sea-ice and its snow loading to support Copernicus operational products and services concerning the polar regions. | AMR-C, IRIS | Type: Inclined, non-sun-synchronous Altitude: 690 km Period: 99 min Inclination: 92 deg Repeat cycle: 367 days LST: Longitude (if geo): Asc/desc: URL: https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Copernicus_Sentinel_Expansion_missions |
| Sentinel CRISTAL-B CRISTAL-B COM | Planned | 30 Jun 2030 | 29 Dec 2037 | To monitor critical climate signals: ice sheet, ice cap melting and sea level, as well as to monitor variability of Arctic and Southern Ocean sea-ice and its snow loading to support Copernicus operational products and services concerning the polar regions. | AMR-C, IRIS | Type: Inclined, non-sun-synchronous Altitude: 690 km Period: 99 min Inclination: 92 deg Repeat cycle: 367 days LST: Longitude (if geo): Asc/desc: URL: https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Copernicus_Sentinel_Expansion_missions |
| Sentinel LSTM-A LSTM-A COM | Planned | 15 Dec 2028 | 15 Jun 2036 | To provide surface temperature observations over land and coastal regions in support of agriculture management services and possibly a range of additional services, by complementing the current visible (VIS) and near-infrared (NIR) Copernicus observations with high spatio-temporal resolution TIR ones. | Land Surface Temperature Radiometer | Type: Sun-synchronous Altitude: 651 km Period: 97.5 min Inclination: 97.7 deg Repeat cycle: 4 days LST: 12:30 (at DN) Longitude (if geo): Asc/desc: URL: https://www.eoportal.org/satellite-missions/lstm |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--------------------------------------|-----------------------|-------------|-------------|---|-------------------------------------|---|
| Sentinel LSTMB LSTM-B COM | Planned | 15 Dec 2030 | 15 Jun 2038 | To provide surface temperature observations over land and coastal regions in support of agriculture management services and possibly a range of additional services, by complementing the current visible (VIS) and near-infrared (NIR) Copernicus observations with high spatio-temporal resolution TIR ones. | Land Surface Temperature Radiometer | Type: Sun-synchronous Altitude: 651 km Period: 97.5 min Inclination: 97.7 deg Repeat cycle: 4 days LST: 12:30 (at DN) Longitude (if geo): Asc/desc: URL: https://www.eoportal.org/satellite-missions/lstm |
| Sentinel ROSE-L A ROSE-L A COM | Planned | 30 Jun 2028 | 30 Dec 2035 | To provide day-and-night monitoring of land, oceans and ice offering more frequent imaging at high spatial resolution and sensitivity, to monitor soil moisture, precision farming, food security, forest biomass and changes to land use. In addition, the mission will monitor polar ice sheets and ice caps, sea ice extent, and snow cover. | L-band SAR | Type: Sun-synchronous Altitude: 693 km Period: 98.74 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 (at AN ± 1 min) Longitude (if geo): Asc/desc: Ascending URL: https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Copernicus_Sentinel_Expansion_missions |
| Sentinel ROSE-L B ROSE-L B COM | Planned | 15 Jul 2030 | 13 Jan 2038 | To provide day-and-night monitoring of land, oceans and ice offering more frequent imaging at high spatial resolution and sensitivity, to monitor soil moisture, precision farming, food security, forest biomass and changes to land use. In addition, the mission will monitor polar ice sheets and ice caps, sea ice extent, and snow cover. | L-band SAR | Type: Sun-synchronous Altitude: 693 km Period: 98.74 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 (at AN ± 1 min) Longitude (if geo): Asc/desc: Ascending URL: https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Copernicus_Sentinel_Expansion_missions |
| Sentinel-1 A ESA / COM | Operational (nominal) | 03 Apr 2014 | 31 Jul 2024 | 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 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-1 B ESA / COM | Operational (nominal) | 25 Apr 2016 | 31 Mar 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 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-1 C ESA / COM | Approved | 31 May 2023 | 30 Apr 2033 | 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 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-1 D ESA / COM | Approved | 30 Sep 2028 | 30 Sep 2038 | 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 min Inclination: 98.19 deg Repeat cycle: 12 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-2 A ESA / COM | Operational (nominal) | 23 Jun 2015 | 15 Jul 2025 | 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 min Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-2 B ESA / COM | Operational (nominal) | 06 Mar 2017 | 28 Feb 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 min Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-2 C ESA / COM | Approved | 15 Jan 2024 | 15 Jan 2034 | 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 min Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-2 D ESA / COM | Approved | 31 Oct 2028 | 31 Oct 2038 | 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 min Inclination: 98.62 deg Repeat cycle: 10 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.esa.int/esaLP/LPgmes.html |
| Sentinel-3 A ESA / EUMETSAT / COM | Operational (nominal) | 16 Feb 2016 | 31 Jan 2026 | 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: 807 km Period: 101 min Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgmes.html |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|-----------------------|-------------|-------------|--|--|--|
| Sentinel-3 B ESA / EUMETSAT / COM | Operational (nominal) | 25 Apr 2018 | 31 Aug 2028 | 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: 807 km Period: 101 min Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-3 C ESA / EUMETSAT / COM | Approved | 15 Oct 2024 | 15 Oct 2034 | 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: 807 km Period: 101 min Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-3 D ESA / EUMETSAT / COM | Approved | 30 Nov 2028 | 30 Nov 2038 | 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: 807 km Period: 101 min Inclination: 98.65 deg Repeat cycle: 27 days LST: 10:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-4 A ESA / EUMETSAT / COM | Approved | 30 Jun 2024 | 31 Dec 2032 | Supporting European atmospheric composition and air quality monitoring services. The Sentinel-4 A mission is carried on MTG S1. | UVN (Sentinel-4) | Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-4 B ESA / EUMETSAT / COM | Approved | 30 Jun 2032 | 31 Dec 2040 | Supporting European atmospheric composition and air quality monitoring services. The Sentinel-4 B mission is carried on MTG S2. | UVN (Sentinel-4) | Type: Geostationary Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): 0 deg Asc/desc: N/A URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-5 A ESA / EUMETSAT / COM | Approved | 31 Dec 2024 | 30 Jun 2032 | To support global atmospheric composition and air quality monitoring services. The Sentinel-5 A mission is carried on EPS-SG-A. | UVNS (Sentinel-5) | Type: Sun-synchronous Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: N/A URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-5 B ESA / EUMETSAT / COM | Approved | 31 Mar 2025 | 30 Sep 2032 | To support global atmospheric composition and air quality monitoring services. | UVNS (Sentinel-5) | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| Sentinel-5 C ESA / COM | Approved | 31 Dec 2038 | 31 Dec 2046 | To support global atmospheric composition and air quality monitoring services. | UVNS (Sentinel-5) | Type: Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| Sentinel-5 precursor ESA / COM / NSO | Operational (nominal) | 13 Oct 2017 | 30 Sep 2027 | Supporting global atmospheric composition and air quality monitoring services. | UVNS (Sentinel-5 precursor) | Type: Sun-synchronous Altitude: 824 km Period: 17 min Inclination: 98.742 deg Repeat cycle: LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.esa.int/esaLP/LPgm.html |
| Sentinel-6 A Michael Freilich Sentinel-6 Michael Freilich EUMETSAT / NASA / NOAA / COM / ESA | Operational (nominal) | 21 Nov 2020 | 30 Jun 2026 | Providing continuity of the reference, high-precision ocean topography service after Jason-3. | DORIS-NG, AMR-C, GNSS POD Receiver, LRA (Sentinel-6), Poseidon-4 Altimeter, GNSS-RO Receiver | Type: Inclined, non-sun-synchronous Altitude: 1343 km Period: 112.4 min Inclination: 66.05 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL: https://sealevel.jpl.nasa.gov/missions/jason3/ |
| Sentinel-6 B EUMETSAT / NASA / NOAA / COM / ESA | Planned | 15 Dec 2025 | 31 May 2031 | To provide continuity of the reference, high-precision ocean topography service after Sentinel-6A. | DORIS-NG, AMR-C, GNSS POD Receiver, LRA (Sentinel-6), Poseidon-4 Altimeter, GNSS-RO Receiver | Type: Inclined, non-sun-synchronous Altitude: 1343 km Period: 112.4 min Inclination: 66.05 deg Repeat cycle: 10 days LST: Longitude (if geo): Asc/desc: N/A URL: https://sealevel.jpl.nasa.gov/missions/jason3/ |
| Sich 2-30 NSAU | Operational (nominal) | 13 Jan 2022 | 13 Jan 2027 | A small Earth remote sensing satellite designed to obtain digital images of the Earth's surface in the visible and near-infrared ranges of electromagnetic wavelengths, as well as to monitor Earth's magnetosphere parameters. | MBEI, MIRS | Type: Inclined, non-sun-synchronous Altitude: 700 km Period: 98.5 min Inclination: 98.26 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| SMAP Soil Moisture Active Passive NASA / CSA | Operational (nominal) | 31 Jan 2015 | 30 Sep 2023 | 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 min Inclination: 98.12 deg Repeat cycle: 8 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://smap.jpl.nasa.gov/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|---|---|--|
| SMOS Soil Moisture and Ocean Salinity (Earth Explorer Opportunity Mission) ESA / CDTI / CNES | Operational (extended) | 02 Nov 2009 | 31 Dec 2025 | 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 min Inclination: 98.44 deg Repeat cycle: 23 days LST: 6:00 Longitude (if geo): Asc/desc: Ascending URL: http://earth.esa.int/SMOS/ |
| SSTL S1-4 UKSA | Operational (nominal) | 16 Sep 2018 | 01 Jan 2026 | A high resolution optical imaging satellites for land use monitoring, urban planning, crop monitoring and pollution monitoring | PAN (BJ-2), MSI (BJ-2) | Type: Sun-synchronous Altitude: 500 km Period: 96.3 min Inclination: 97.7 deg Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.sstl.co.uk |
| STARLETTE CNES | Operational (nominal) | 06 Feb 1975 | 31 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 min Inclination: 49.83 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: |
| STELLA CNES | Operational (nominal) | 30 Sep 1993 | 31 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 min Inclination: 98 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: |
| STSAT-3 Science & Technology SATellite-3 SI / KASI / KARI | Operational (extended) | 22 Nov 2013 | 31 Dec 2022 | Galactic Plane Survey, Cosmic Background Radiation Measurement, Land use | COMIS, MIRIS | Type: Sun-synchronous Altitude: 600 km Period: Inclination: Repeat cycle: 28 days LST: Longitude (if geo): Asc/desc: Ascending URL: |
| Suomi NPP Suomi National Polar-orbiting Partnership NASA / NOAA | Operational (extended) | 28 Oct 2011 | 01 Oct 2026 | 5-year nominal mission life. Operational polar weather and climate measurements. CrIS MWIR non-operational on Suomi NPP effective 12 July 2021. | CrIS, CERES, VIIRS, ATMS, OMPS, OMPS-L | Type: Sun-synchronous Altitude: 824 km Period: 101 min Inclination: 98.7 deg Repeat cycle: 16 days LST: 13:30 Longitude (if geo): Asc/desc: Ascending URL: http://www.jpss.noaa.gov |
| Swarm Earth's Magnetic Field and Environment Explorers ESA / CNES / CSA | Operational (extended) | 22 Nov 2013 | 31 Dec 2025 | A three-satellite constellation that is providing the best ever survey of the geomagnetic field and its temporal evolution to gain new insights into improving our knowledge of the Earth's interior and climate. Canada contributes the electric field instrument that is required to correctly separate the measured magnetic field into its different sources. | Laser Reflectors (ESA), ASM, VFM, STR, EFI, ACC, GPS Receiver (Swarm) | Type: Inclined, non-sun-synchronous Altitude: 450 km Period: Inclination: 87.5 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: https://earth.esa.int/eogateway/missions/swarm |
| SWFO-L1 Space Weather Follow-On - Lagrange 1 NOAA / NASA | Planned | 31 Oct 2024 | 31 Dec 2029 | In-situ solar wind measurements, coronal mass ejection imagery, supra thermal ion flux, magnetic field vector, coronal white light, geomagnetic storms. | CCOR, MAG, STIS, SWPS | Type: Earth-Sun L-1 Altitude: Period: Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |
| SWOT Surface Water Ocean Topography NASA / UKSA / CNES / CSA | Approved | 12 Dec 2022 | 30 Nov 2025 | 3 year nominal mission. Characterize ocean mesoscale and sub-mesoscale circulation at spatial resolutions = 15 km and inventory all terrestrial water bodies with surface area > 250 m ² and rivers with width > 100 m | LRA, DORIS-NG, GPSP, Ka-band Radar Interferometer (KaRIN), AMR S, POSEIDON-3C Altimeter | Type: Inclined, non-sun-synchronous Altitude: 891 km Period: 102.8 min Inclination: 77.6 deg Repeat cycle: 21 days LST: Longitude (if geo): Asc/desc: NA URL: http://swot.jpl.nasa.gov |
| TanDEM-X TerraSAR-X Add-on for Digital Elevation Measurements DLR | Operational (extended) | 21 Jun 2010 | 31 Dec 2026 | Cartography, land surface, civil planning and mapping, digital terrain models, environmental monitoring. | X-Band SAR | Type: Sun-synchronous Altitude: 514 km Period: 94.85 min Inclination: 97.4 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.dlr.de/hf/desktopdefault.aspx/tabid-2317/3669_read-5488/ |
| TEMPO Tropospheric Emissions: Monitoring of Pollution NASA | Approved | 27 Jan 2023 | 31 Dec 2024 | Hourly measurements of air pollution over North America, from Mexico City to the Canadian oil sands, at high spatial resolution. Measurements in ultraviolet and visible wavelengths will provide a suite of products including the key elements of tropospheric air pollution chemistry. Uses a commercial geostationary host spacecraft. Will be part of the first global geostationary constellation for pollution monitoring, along with European and Korean missions now in development. | Spectrometer (TEMPO) | Type: Geostationary Altitude: 35786 km Period: 1436 min Inclination: Repeat cycle: LST: Longitude (if geo): Asc/desc: NA URL: http://tempo.si.edu/index.html |
| Terra Terra (formerly EOS AM-1) NASA / METI / CSA | Operational (extended) | 18 Dec 1999 | 30 Sep 2023 | 6-year nominal mission life, currently in extended operations. In late 2020, Terra began to drift in its orbit when the mission stopped performing inclination adjust maneuvers. 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 volcanology. | MOPITT, MODIS, MISR, CERES, ASTER | Type: Sun-synchronous Altitude: 705 km Period: 99 min Inclination: 98.2 deg Repeat cycle: 16 days LST: 10:15 Longitude (if geo): Asc/desc: Descending URL: http://terra.nasa.gov/ |
| TerraSAR-X DLR | Operational (extended) | 15 Jun 2007 | 31 Dec 2024 | 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 min Inclination: 97.4 deg Repeat cycle: 11 days LST: 18:00 Longitude (if geo): Asc/desc: Ascending URL: http://www.terasar.de/ |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|--|------------------------|-------------|-------------|--|---|---|
| THEOS Thailand Earth Observation System GISTDA | Operational (extended) | 01 Oct 2008 | 01 Oct 2023 | Monitoring, land use, disasters, cartography and mapping | PAN (GISTDA), MS (GISTDA) | Type: Sun-synchronous Altitude: 822 km Period: 101 min Inclination: 98.7 deg Repeat cycle: 26 days LST: 10:00:00 Longitude (if geo): Asc/desc: Descending URL: https://www.gistda.or.th/main/en/node/569 |
| THEOS-2 Main VHR Satellite Thailand Earth Observation System 2: Main VHR Satellite GISTDA | Planned | 31 Dec 2022 | 01 Nov 2031 | National security, monitoring, land use, disasters, cartography and mapping | PAN (GISTDA) Copy, MS (GISTDA) Copy | Type: Sun-synchronous Altitude: 621 km Period: 97 min Inclination: 97.9 deg Repeat cycle: 26 days LST: 9:30:00 Longitude (if geo): Asc/desc: Descending URL: |
| THEOS-2 Small Satellite Thailand Earth Observation System 2: Small Satellite GISTDA | Planned | 01 Mar 2023 | 01 Mar 2026 | Monitoring, disasters | CERIA Camera | Type: Sun-synchronous Altitude: 500 km Period: 96 min Inclination: 97.4 deg Repeat cycle: LST: 10:30:00 Longitude (if geo): Asc/desc: Ascending URL: |
| TROPICS Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS) NASA | Approved | 31 Dec 2022 | 02 Oct 2025 | Use a constellation of advanced cubesat passive microwave radiometers providing average revisit time of 30 minutes to improve the understanding and prediction of the impact of environmental temperature and humidity, precipitation evolution, including diurnal cycle, and warm-core strength on the evolution of tropical cyclone structure, size, and intensity. | TROPICS | Type: Inclined, non-sun-synchronous Altitude: 550 km Period: 96 min Inclination: 30 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: TBD URL: https://tropics.ll.mit.edu/CMS/tropics/Mission-Overview |
| TROPICS Pathfinder Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of Smallsats (TROPICS) Pathfinder NASA | Operational (nominal) | 30 Jun 2021 | 31 Oct 2022 | The TROPICS Pathfinder CubeSat (the qualification unit converted to a flight unit) is a risk reduction mission to a Sun-Synchronous Orbit (SSO) to test the system from end-to-end prior to the launch of the constellation. | TROPICS | Type: Sun-synchronous Altitude: 535 km Period: 95 min Inclination: 97.5 deg Repeat cycle: LST: 2:00:00 Longitude (if geo): Asc/desc: Ascending URL: https://tropics.ll.mit.edu/CMS/tropics/Mission-Overview |
| TRUTHS Traceable Radiometry Underpinning Terrestrial- and Helio- Studies (TRUTHS) ESA / UKSA | Approved | 31 Dec 2026 | 31 Dec 2034 | Ultra high accuracy SI-traceable spectrally resolved measurements of incoming and Earth reflected solar radiation, globally sampled at 50 m spatial resolution as a benchmark for radiation budget and other climate indicators in the solar reflective domain e.g cloud, Albedo, Land products, Ocean colour, carbon cycle Designed explicitly as an operational climate mission TRUTHS in addition to its own data, provides reference calibration to other optical sensors operating in the spectral range 320 to 2400 nm, including amongst other 'new space' sensors and the future GHG constellation, improving their performance and interoperability. It also provides a radiometric SI-traceable anchor to existing post-launch calibration infrastructure such as deserts and the Moon. The mission additionally provides spectrally resolved and total solar irradiance measurements for climate and atmosphere/surface interaction studies. | CSAR, HIS | Type: Inclined, non-sun-synchronous Altitude: 610 km Period: Inclination: 90 deg Repeat cycle: 61 days LST: Longitude (if geo): Asc/desc: TBD URL: |
| TSIS-1-on-ISS International Space Station/Total and Spectral solar Irradiance Sensor NASA | Operational (nominal) | 17 Dec 2017 | 18 Mar 2023 | Continue solar irradiance record. | TSIS-1/SIM, TSIS-1/TIM | Type: Inclined, non-sun-synchronous Altitude: 407 km Period: 93 min Inclination: 51.6 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://science.nasa.gov/missions/tsis-1 |
| TSIS-2 Total and Spectral solar Irradiance Sensor 2 NASA | Approved | 13 Feb 2025 | 09 Apr 2028 | Continue solar irradiance record. | TSIS-2/TIM, TSIS-2/SIM | Type: Sun-synchronous Altitude: 600 km Period: 90 min Inclination: 98.7 deg Repeat cycle: LST: 17:00:00 Longitude (if geo): Asc/desc: Ascending URL: |
| VENUS Vegetation and Environment monitoring on a New Micro-Satellite CNES / ISA | Operational (extended) | 02 Aug 2017 | 31 Dec 2022 | 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: http://smec.cnes.fr/VENUS/index.htm |
| VNREDSat-1 VAST / ASTRUM | Operational (extended) | 07 May 2013 | 31 Dec 2022 | Land cover mapping | VNREDSat 1 MS | Type: Sun-synchronous Altitude: 680 km Period: Inclination: Repeat cycle: LST: 10:30 Longitude (if geo): Asc/desc: URL: http://www.vast.ac.vn/ban-ln-vnredsat1 |
| WildFireSat CSA / NRCAN / ECCO | Planned | 01 Mar 2028 | 01 Jun 2032 | A system consisting of one or more microsatellite, carrying an instrument that consists of an assembly of three cameras providing co-registered MWIR, TIR, and VNIR data. The satellite(s) will monitor wildfires daily, in late afternoon, to support 1) wildfire management and research, 2) smoke and air quality forecasting and 3) wildfire carbon emission reporting. The mission will be designed for an operational lifetime of 5 years, but with sufficient consumables for 7 years. | CWFMS | Type: Sun-synchronous Altitude: 650 km Period: 88 min Inclination: 98 deg Repeat cycle: 24 days LST: 18:00 Longitude (if geo): Asc/desc: TBD URL: https://www.asc-csa.gc.ca/eng/satellites/wildfiresat/default.asp |
| Yunhai-1 03 CAST | Operational (nominal) | 20 Sep 2022 | 20 Sep 2028 | Detect the atmospheric, marine and space environments, disaster prevention and mitigation, and scientific experiments. | Infrared Earth Horizon Sensor, Infrared Scanning Radiometer | Type: Sun-synchronous Altitude: 765 km Period: Inclination: 98.5 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: URL: |

| Mission | Status | Launch Date | EOL Date | Applications | Instruments | Orbit Details & URL |
|---|------------------------|-------------|-------------|--|---|---|
| ZACube-2 SANSa / CPUT | Operational (nominal) | 27 Dec 2018 | 27 Dec 2022 | ZACube-2 is equipped with an automatic identification system (AIS) receiver to demonstrate AIS message reception using its SDR-based payload. Additionally, ZACube-2 has a near-infrared imager for forest fire detection. | AIS Receiver, K-line Imager | Type: Sun-synchronous Altitude: 485 km Period: 94.6 min Inclination: 97.3 deg Repeat cycle: LST: Longitude (if geo): Asc/desc: Ascending URL: https://directory.eoportal.org/web/eoportal/satellite-missions/v-w-x-y-z/zacube-2 |
| ZY-1-02D Zi Yuan 1 Number 2 Optical Mission of China CRESDA | Operational (nominal) | 12 Sep 2019 | 31 Dec 2024 | Earth resources, environmental monitoring, land surface. | OCD (ZY-1-02C and ZY-3), PAN (ZY-1-02C) | Type: Sun-synchronous Altitude: 778 km Period: 100.3 min Inclination: 98.5 deg Repeat cycle: 26 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| ZY-1-02E Zi Yuan 1 Number 2 Optical Mission of China CRESDA | Operational (nominal) | 26 Dec 2021 | 31 Dec 2026 | The primary objective of the ZY series is to acquire high-resolution panchromatic and multispectral imagery for land resource surveys, disaster monitoring, forestry and ecological monitoring. | OCD (ZY-1-02C and ZY-3), PAN (ZY-1-02C), IR Camera (ZY-1-02E) | Type: Sun-synchronous Altitude: 778 km Period: Inclination: Repeat cycle: 3 days LST: Longitude (if geo): Asc/desc: URL: |
| ZY-3-01 Zi Yuan 3 Number 1 CRESDA | Operational (extended) | 09 Jan 2012 | 31 Dec 2022 | Earth resources, land surface, stereo mapping | OCD (ZY-02C and ZY-3), MUX (ZY-3) | Type: Sun-synchronous Altitude: 505 km Period: 97.7 min Inclination: 98.5 deg Repeat cycle: 59 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| ZY-3-02 Zi Yuan 3 Number 2 CRESDA | Operational (extended) | 30 May 2016 | 31 Dec 2022 | Earth resources, land surface, stereo mapping | OCD (ZY-1-02C and ZY-3), MUX (ZY-3-02) | Type: Sun-synchronous Altitude: 505 km Period: 94.7 min Inclination: 97.4 deg Repeat cycle: 59 days LST: 10:30 Longitude (if geo): Asc/desc: Descending URL: http://www.cresda.com/ |
| ZY-3-03 Zi Yuan 3 Number 3 CRESDA | Operational (nominal) | 25 Jul 2020 | 31 Dec 2025 | Earth resources, land surface, stereo mapping | OCD (ZY-1-02C and ZY-3), MUX (ZY-3-02) | Type: Sun-synchronous Altitude: 505 km Period: 94.7 min Inclination: 97.4 deg 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 924 instruments (468 distinct instruments, some being repeats) on their Earth observation missions in the 2023 - 2039 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 Multi-Viewing Multi-Channel Multi-Polarisation Imaging EUMETSAT (ESA) | Current: - Future: METOP-SG A1, METOP-SG A2, METOP-SG A3 Complete: - | Being developed | Atmospheric chemistry | Measure aerosol parameters, air quality index, surface albedo, cloud information | Waveband: VIS-SWIR: 12 channels between 0.41 µm to 2.1 µm Spatial resolution: 4km Swath width: 2200x2200 km for the VNIR channels 2200 x 1100 km for the SWIR channels Accuracy: |
| A-DCS3 CNES (NASA, NOAA) | Current: NOAA-19, Metop-B, Metop-C Future: - Complete: Metop-A, NOAA-12, NOAA-14, NOAA-15, NOAA-9, NOAA-10, NOAA-11, NOAA-13, NOAA-16, NOAA-17, NOAA-18, SARAL | Operational | Data collection | Location data by Doppler measurements. Metop-B only providing an ARGOS-2 service since commissioning in 2012 due to satellite cabling problem. | Waveband: UHF: 401 MHz, 467 MHz Spatial resolution: Swath width: Accuracy: |
| A-DCS4 CNES, NOAA (EUMETSAT, ISRO) | Current: NOAA-19 Future: OCEANSAT-3, METOP-SG B1, CDARS, METOP-SG B2, METOP-SG B3, GOES-14, GOES-15, EWS-G1 Complete: - | Operational | Data collection | Data collection and communication system for receiving and retransmitting data from ocean and land-based remote observing platforms/transponders. | Waveband: UHF: 401 MHz, 467 MHz Spatial resolution: Swath width: Accuracy: |
| ABI Advanced Baseline Imager NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | 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 | Current: Swarm Future: - Complete: - | Operational | Precision orbit | Measurement of the spacecraft non-gravitational accelerations, linear accelerations range: +/- 2*10 ⁻⁴ m/s ² ; angular measurement range: +/- 9.6° 10 ⁻³ rad/s ² ; measurement bandwidth: 10 ⁻⁴ to 10 ⁻² Hz; Linear resolution: 1.8*10 ⁻¹⁰ m/s ² ; angular resolution: 8*10 ⁻⁹ rad/s ² . | Waveband: N/A Spatial resolution: 0.1 nm/s ² Swath width: N/A Accuracy: overall instrument random error: <10 - 8 m/s ² |
| ACE-FTS Atmospheric Chemistry Experiment (ACE) Fourier Transform Spectrometer CSA | Current: SCISAT-1 Future: - Complete: - | 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 |
| Advanced DCS Advanced Data Collection System ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | Proposed | Space environment | Space Environmental Monitoring (SEM). | Waveband: Spatial resolution: Swath width: Accuracy: |
| Advanced GOCI Advanced Geostationary Ocean Colour Imager KARI, KIOST (ADS) | Current: GEO-KOMPSAT-2B Future: - Complete: - | Operational | Ocean colour instruments | Ocean colour information, coastal zone monitoring, land resources monitoring. | Waveband: VIS - NIR: 0.40 - 0.88 µm (12 channels) Spatial resolution: 236 x 360 m Swath width: FOR (Field Of Regard) is 2500km x 2500km, divided into 12 slots. Accuracy: |
| Advanced KMSS Advanced Multispectral Imager (VIS) ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 KMA (Harris, KARI) | Current: GEO-KOMPSAT-2A Future: - Complete: - | 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: 16 bands covering 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 | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 Radiomet Advanced Radio-occultation receiver ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|--|---|
| AEISS Advanced Electronic Image Scanning System KARI (ASTRIUM) | Current: KOMPSAT-3 Future: - Complete: - | 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: 0.7 m, VNIR: 2.8 m Swath width: 15 km Accuracy: |
| AEISS-A Advanced Electronic Image Scanning System-A KARI (ASTRIUM) | Current: KOMPSAT-3A Future: - Complete: - | 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: 0.7 m, VNIR: 2.8 m, IR: 5.5m Swath width: 15 km Accuracy: |
| AEISS-HR Advanced Electronic Image Scanning System-High Resolution KARI (KAI) | Current: - Future: KOMPSAT-7 Complete: - | 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:0.5 m, VNIR: 2m Swath width: 15 km Accuracy: |
| AEISS-HR-A Advanced Electronic Image Scanning System-High Resolution-A KARI | Current: - Future: KOMPSAT-7A Complete: - | 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:0.5 m, VNIR: 2m Swath width: 15 km Accuracy: |
| AGRI Advanced Geosynchronous Radiation Imager NRSCC (NSMC-CMA, CNSA, CAST) | Current: FY-4A, FY-4B Future: FY-4C, FY-4D, FY-4E, FY-4F, FY-4G Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | A multiple channel radiation imager, one of the primary instruments aboard FY-4. Technically featured by a precisely designed two-mirror structure, capable of accurate and flexible sensing in two dimensions, and minute-level fast sector scanning. Frequent Earth imaging over 14 bands with off-axis three reflections of the primary optic system. On-board black body available for IR calibrations at very short time intervals. | Waveband: 12 channels from 0.55 - 13.8 µm Spatial resolution: 0.5-1 km VIS, 2 km NIR, 4 km TIR Swath width: Full Earth disk Accuracy: 0.5 - 4.0 km |
| AHI Advanced Himawari Imager JMA | Current: Himawari-8, Himawari-9 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures cloud cover, cloud motion, cloud height, cloud properties, water vapour, rainfall, sea surface temperatures and Earth radiation, dust, aerosols, volcanic ash, fires, snow and ice cover. | Waveband: 16 bands from 0.47 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 0.47 µm, 0.51 µm and 0.86 µm band, 2.0 km in all others Swath width: Full disk, Japan Area (Region 1, 2) : fixed area, Target Area (Region 3) and Landmark Area (Region 4, 5) : flexible area Accuracy: |
| AIP Advanced Ionospheric Probe NSPO | Current: Fomatos-5 Future: - Complete: - | Operational | | All-in-one plasma sensor with a sampling rate up to 8,192 Hz to measure ionospheric plasma concentrations, velocities, temperatures, and ambient magnetic fields over a wide range of spatial scales | Waveband: Spatial resolution: Swath width: Accuracy: |
| AIRS Atmospheric Infra-red Sounder NASA | Current: Aqua Future: - Complete: - | 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 AIS Receiver NOSA | Current: NORSAT-3 Future: NORSAT-4 Complete: AISSat-1, AISSat-3, NORSAT-1, NORSAT-2, AISSat-2 | Operational | Communications | Reception of VHF AIS (Automatic Identification System). | Waveband: Spatial resolution: Swath width: Accuracy: |
| AIS Automatic Identification System UKSA (CSIRO) | Current: NovaSAR-1 Future: - Complete: - | Operational | Other | Automated location and tracking of vessels | Waveband: AIS: 156.775 - 162.025 MHz Spatial resolution: Swath width: Accuracy: |
| AIS (RCM) Automated Identification System (RADARSAT Constellation) CSA (DND) | Current: RCM-1, RCM-2, RCM-3 Future: - Complete: - | Operational | Data collection | Ship identification (name, location, heading, cargo, etc). | Waveband: VHF (162 MHz) Spatial resolution: N/A Swath width: 5300 km Accuracy: Better than 90% ship detection, for Class A ships, when ships are in view for a minimum of 5 minutes. |
| AIS Receiver (MDASat-1) Automatic Identification System Receiver (MDASat-1) SANSa | Current: MDASat-1a, MDASat-1b, MDASat-1c Future: - Complete: - | Operational | Data collection | MDASat-1 is equipped with an upgraded AIS receiver from its predecessor, ZACube-2. It will be capable of detecting AIS and AIS-LR messages. Additionally, it has the ability to capture raw data in the maritime spectrum which opens up the possibility to perform diagnostic testing to assess signal interference conditions in the band and their effect on the decoding of messages. | Waveband: VHF Maritime Band Spatial resolution: Swath width: Accuracy: |
| AIS Receiver (ZACube-2) Automatic Identification System Receiver (ZACube-2) SANSa | Current: ZACube-2 Future: - Complete: - | Operational | Data collection | ZACube-2 will demonstrate AIS message reception using its SDR-based payload. | Waveband: VHF Maritime Band Spatial resolution: Swath width: Accuracy: |
| AIS/IOT AIS/IoT CubeSat Test Mission NOSA | Current: - Future: NORSAT-TD Complete: - | Being developed | Communications | Reception of VHF AIS (Automatic Identification System). | Waveband: Spatial resolution: Swath width: Accuracy: |
| ALADIN Atmospheric Laser Doppler Instrument ESA | Current: ADM-Aeolus Future: - Complete: - | Operational | 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 |
| ALISS III Advanced LISS III ISRO | Current: - Future: RESOURCESAT-3, RESOURCESAT-3A Complete: - | Being developed | 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 in VNIR and 1 band in SWIR Spatial resolution: 20 m, 10 m Swath width: 925 km Accuracy: 200m |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-----------------|--|---|--|
| ALT Radar Altimeter NSOAS (CAST) | Current: HY-2B, HY-2C, HY-2D Future: HY-2E, HY-2F, HY-2G, HY-2H, HY-2A Complete: - | 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 | Current: SARAL Future: - Complete: - | Operational | 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: |
| ALTIUS Instrument ESA | Current: - Future: ALTIUS Complete: - | Being developed | Atmospheric chemistry | A high-resolution 2D imager that observes ozone from side-on, at Earth's limb or atmospheric boundary. This limb-sounding technique allows ozone to be viewed at different altitudes, thereby providing vertical profiles of different ozone concentrations. The instrument uses three independent spectral imagers that operate in the ultraviolet, visible and near-infrared, achieving global coverage in a three-day revisit cycle. | Waveband: Spatial resolution: Swath width: Accuracy: |
| AMR Advanced Microwave Radiometer NASA (NOAA, CNES, EUMETSAT) | Current: Jason-3 | 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 |
| AMR-C Advanced Microwave Radiometer for Climate NASA (NOAA, ESA, EUMETSAT) | Current: Sentinel-6 A Michael Freilich Future: Sentinel-6 B, Sentinel CRISTAL-A, Sentinel CRISTAL-B Complete: - | Operational | Imaging multi-spectral radiometers (passive microwave) | Capabilities of the AMR with the addition of an on-board calibrator for high stability wet-tropospheric path delay correction. | Waveband: Microwave: 18.7, 23.8 and 34 GHz. With additional experimental high-frequency channels (90, 130, 168 GHz) for high resolution complementing the SAR mode of Poseidon-4 radar. Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz baseline channels with 5km for higher frequency experimental channels Swath width: Nadir-only viewing, associated to the JASON-CS radar altimeter Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K |
| AMR-S AMR-S Two-Beam Microwave Radiometer NASA (UKSA, CNES, CSA) | Current: - Future: SWOT Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | Capabilities of the AMR with the addition of a 2nd beam to provide wet-tropospheric path delay correction within both swaths of the primary radar instrument (KaRIn) | Waveband: Microwave: 18.7, 23.8 and 34 GHz. Spatial resolution: 41.6 km at 18.7 GHz, 36.1 km at 23.8 GHz, 22.9 km at 34 GHz baseline channels Swath width: two nadir-looking beams complementing the 120km KaRIn radar altimeter swath Accuracy: Total water vapour: 0.2 g/sq cm, Brightness temperature: 0.15 K for each of the two beams |
| AMSR2 Advanced Microwave Scanning Radiometer 2 JAXA | Current: GCOM-W Future: - Complete: - | 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 (effective swath: 1618 km) Accuracy: Accuracy of the latest standard products (RMSE): Sea surface temperature: 0.5 degC, Sea ice concentration: 9%, Cloud liquid water: 0.04 kg/m ² , Water vapour: 1.5 kg/m ² through total column, Sea surface wind speed 1.0 m/s, (Relative Error in %) Precipitation rate: 48 % for ocean & 86 % for land, (MAE) Snow depth: 18 cm, Soil Moisture Content: 4 %vol. See GCOM-W Product Information (https://suzaku.eorc.jaxa.jp/GCOM_W/materials/w_productinfo.html) for more detail. |
| AMSR3 Advanced Microwave Scanning Radiometer 3 JAXA | Current: - Future: GOSAT-GW Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | Measurements of water vapour, cloud liquid water, precipitation including snowfall, winds, sea surface temperature, sea ice concentration, snow cover, soil moisture. | Waveband: Microwave: 6.925 GHz, 7.3 GHz, 10.25 GHz, 10.65 GHz, 18.7 GHz, 23.8 GHz, 36.5 GHz, 89.0 GHz, 165.5 GHz, 183.3 GHz Spatial resolution: 5 - 50 km (dependent on frequency) Swath width: 1535 km (effective swath) Accuracy: Target and standard accuracies for each standard product were defined from user requirements. |
| AMSU-A Advanced Microwave Sounding Unit-A NASA | Current: Aqua Future: - Complete: - | Operational | Atmospheric temperature and humidity sounders | All-weather night-day temperature sounding to an altitude of 45 km. AMSU-A on Aqua is still partially operational, with 9 of the 15 channels working and collecting data. | 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/m ² , ice & snow cover: 10% |
| AMSU-A Advanced Microwave Sounding Unit-A NOAA (UKSA) | Current: NOAA-19, Metop-B, Metop-C Future: - Complete: Metop-A, 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/m ² , ice & snow cover: 10% |
| APAN Advanced PAN ISRO | Current: - Future: RESOURCESAT-3S, RESOURCESAT-3SA Complete: - | Being developed | High resolution optical imagers | High-resolution images for the study of topography, urban areas, development of DTM, run-off models etc., urban sprawl, forest cover/timber volume, land use change. | Waveband: Panchromatic VIS: 0.45 - 0.90 µm Spatial resolution: 1.25 Swath width: 60 km Accuracy: 50m |
| ARGUS 2000 Khalifa University (UAE SA, American University of Ras Al Khaimah) | Current: MeznSat Future: - Complete: - | Operational | Earth radiation budget radiometers | ARGUS 2000 can be utilized to map the spatial variation of greenhouse gases. Measurement interpretation requires spacecraft attitude information for an accurate geolocation of the spectrometer surface pixel, application of a radiative transfer retrieval algorithm and knowledge of surface cloud conditions and topography. Utilizing a near nadir-pointing configuration, the spectrometer can record infrared radiation emitted from the Earth's surface and atmosphere to space. | Waveband: 1000 nm - 1650 nm range Spatial resolution: InGaAs detector 1000nm - 1650nm infrared range, 6nm spectral resolution. Swath width: The full-width-half-maximum is estimated at 0.15 degrees. At a typical LEO orbital height of 600km, this corresponds to a surface tile of length 1.57km. It is a single pixel detector. Accuracy: Due to alignment difficulties and variation between test lamps and solar insolation, results are only accurate to approximately 10%. |
| ASCAT Advanced Scatterometer EUMETSAT (ESA) | Current: Metop-B, Metop-C Future: - Complete: Metop-A | Operational | Scatterometers | Measures wind speed and direction over ocean, soil moisture, sea ice cover, sea ice type, snow cover and snow parameters and vegetation parameters | 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 |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|--|-------------|---|--|--|
| ASI Atmospheric Sounding Interferometer CAST (NSMC-CMA, CNSA) | Current: FY-3D, FY-3E Future: FY-3F, FY-3H, FY-3I Complete: - | Operational | Atmospheric temperature and humidity sounders | Atmospheric sounding for weather forecasting. | Waveband: Spatial resolution: Swath width: Accuracy: |
| ASM Absolute Scalar Magnetometer CNES | Current: Swarm Future: - Complete: - | Operational | 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) | Current: Terra Future: - Complete: - | 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. ASTER SWIR detectors are no longer functioning due to anomalously high SWIR detector temperatures. ASTER SWIR data acquired since April 2008 are not useable, and show saturation of values and severe striping. All attempts to bring the SWIR bands back to life have failed, and no further action is envisioned. | 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 | Current: - Future: RESOURCESAT-3, RESOURCESAT-3A Complete: - | Proposed | High resolution optical imagers | Atmospheric correction. | Waveband: VNIR Hyperspectral Spatial resolution: 240 m Swath width: 925 km Accuracy: |
| ATLAS Advanced Topographic Laser Altimeter System NASA | Current: ICESat-2 Future: - Complete: - | Operational | Lidars | Provide data on ice sheet height and sea ice thickness, land altitude, aerosol height distributions, cloud height and boundary layer height. | Waveband: VIS: Laser emits at 532 nm Spatial resolution: 6 spots 15 m in diameter separated by 1.5 cm along track 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 | Current: - Future: EarthCARE Complete: - | 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: |
| ATMS Advanced Technology Microwave Sounder NASA (NOAA) | Current: JPSS-1, JPSS-2 Future: JPSS-3, JPSS-4, Suomi NPP Complete: - | 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 |
| AVHRR/3 Advanced Very High Resolution Radiometer/3 EUMETSAT, NOAA | Current: NOAA-19, Metop-B, Metop-C Future: - Complete: Metop-A, NOAA-15, NOAA-16, NOAA-17, NOAA-18 | 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: |
| AWIFS Advanced Wide Field Sensor ISRO | Current: RESOURCESAT-2A Future: - Complete: RESOURCESAT-1, RESOURCESAT-2 | 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 | Current: - Future: EarthCARE Complete: - | 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 |
| BIK-SD 1 High resolution wide capture multispectral infraredoptical sensor ROSKOSMOS | Current: - Future: Resurs-PM N1, Resurs-PM N2, Resurs-PM N3 Complete: - | Proposed | Imaging multi-spectral radiometers (vis/IR) | Provides a simultaneous taking of images of an object in several spectral bands of thermal range with detection and registration of land-based, subsurface-based and space-based objects. | Waveband: 3.5 - 4.1 μm ; 8.1 - 8.45 μm ; 8.45 - 8.80 μm ; 8.90 - 9.25 μm ; 10.3 - 11.3 μm ; 11.5 - 12.5 μm Spatial resolution: 20 - 23.5 m Swath width: 120 km Accuracy: |
| BRLK S-range S-band Synthetic Aperture Radar ROSKOSMOS | Current: - Future: Kondor-FKA N1, Kondor-FKA N2 Complete: - | Approved | Imaging microwave radars | Disaster monitoring, sea surface monitoring, information support of environmental management | Waveband: S-band Spatial resolution: 1-12 m Swath width: 10-100 km Accuracy: |
| C-Band SAR C-Band Synthetic Aperture Radar ESA | Current: Sentinel-1 A, Sentinel-1 B Future: Sentinel-1 C, Sentinel-1 D Complete: - | Operational | 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) |
| C-SAR C-Band Synthetic Aperture Radar CRESDA | Current: GF-3 Future: - Complete: - | Operational | Imaging microwave radars | Earth resources, environmental monitoring, land use, urban studies. | Waveband: C-Band: 8 - 4 GHz Spatial resolution: 1-500KM Swath width: 10-650KM Accuracy: |
| CALLIOP Cloud-Aerosol Lidar with Orthogonal Polarization NASA | Current: CALIPSO Future: - Complete: - | 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) |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|--|--|
| CAR High Resolution Camera CONAE | Current: - Future: SARE-2A (S1), SARE-2A (S2), SARE-2A (S3), SARE-2A (S4) Complete: - | Approved | Imaging multi-spectral radiometers (vis/IR) | Panchromatic and multispectral (Vis/IR) measurements with high spatial resolution, with stereo capability for DEM generation. Applications in emergencies in general, agriculture, land use/land cover, change detection, urban environment, cartography, topography. | Waveband: Panchromatic band - P: 450-900 nm Vis/IR bands - B1: 450-520 nm - B2: 520-590 nm - B3: 630-690 nm - B4: 770-890 nm Spatial resolution: Panchromatic band: 1 m Vis/IR bands: 4 m Swath width: 12 km Accuracy: Absolute radiometric accuracy: 5% |
| CARBONITE-2 Imager UKSA | Current: CARBONITE-2 Future: - Complete: - | Operational | High resolution optical imagers | High resolution optical imagery for land use monitoring, urban planning, crop monitoring and pollution monitoring | Waveband: Panchromatic Spatial resolution: 1.2 m Swath width: 5 km Accuracy: |
| CCD (ZY Series) CCD and multispectral imager CRESDA | Current: ZY-1-02D, ZY-3-03, ZY-1-02E Future: - Complete: ZY-1-02C, ZY-3-01, ZY-3-02 | Operational | Imaging multi-spectral radiometers (vis/IR) | Earth resources, environmental monitoring, land use. | Waveband: 0.5-0.8 µm Spatial resolution: 2.36m (ZY-1-02C HR) 2.1m(ZY-3) Swath width: 52km(ZY-3) 54km(ZY-1-02C) Accuracy: |
| CCOR Compact Coronagraph NOAA (NASA) | Current: - Future: GOES-U, SWFO-L1 Complete: - | Proposed | Space environment | | Waveband: Spatial resolution: Swath width: Accuracy: |
| CER Coherent Electromagnetic Radio Tomography CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | Radio transmission from e-POP to ground for radio propagation and ionospheric scintillation measurements. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: |
| CERES Cloud and the Earth's Radiant Energy System NASA | Current: JPSS-1 Future: - Complete: TRMM, Suomi NPP, Terra, Aqua | 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) |
| CERIA Camera GISTDA | Current: - Future: THEOS-2 Small Satellite Complete: - | Being developed | High resolution optical imagers | THEOS-2 Small Satellite's optical payload consists of RGB bayer type sensors (5.9km x 5.9km). Data is used for general monitoring and disasters. | Waveband: MS (B:0.4-0.51 µm, G:0.49-0.58 µm, R:0.58-0.63 µm) Spatial resolution: MS: 1.18-1.2m Swath width: 5.9km (@550km altitude) Accuracy: Geolocation Accuracy: 250m |
| CIRC Compact InfraRed Camera JAXA | Current: ALOS-2 Future: - Complete: - | Operational | Other | Active fire detection. Land surface temperature. | Waveband: TIR: 8 - 12 µm Spatial resolution: 210m Swath width: 128 km Accuracy: 0.2 K@300 K |
| CLARA Compact Lightweight Absolute Radiometer NOSA | Current: NORSAT-1 Future: - Complete: - | Operational | Earth radiation budget radiometers | CLARA is a scientific instrument that will be used to determine the total solar irradiance of the Sun. | Waveband: Spatial resolution: Swath width: Accuracy: |
| CLARREO Pathfinder Reflected Solar CLARREO Pathfinder - RS NASA | Current: - Future: CLARREO Pathfinder-on-ISS Complete: - | Being developed | Hyperspectral imagers | Demonstration of high accuracy SI-traceable calibration within 350-2300 nm spectral range; demonstration of ability to transfer this calibration to other Earth observing instruments. | Waveband: 350 to 2300 nm at 3-nm sampling interval with 6-nm resolution. Spatial resolution: 500 m. Swath width: 10 deg (70 km). Accuracy: Absolute uncertainty goal is 0.3% (k=1) in reflectance. |
| CLIM 3-band CLOUD Imager COM (EUMETSAT) | Current: - Future: Sentinel CO2M-A, Sentinel CO2M-B, Sentinel CO2M-C Complete: - | Being developed | Atmospheric chemistry | 3-band cloud pushbroom imager for detecting low and high clouds in the spatial sample of CO2I allowing to remove these data from the retrieval process. | Waveband: 3 bands: 670, 752, 1370 nm Spatial resolution: < 0.4°0.4 km2 Swath width: 465km Accuracy: SNR >= 200 in the 3 spectral bands |
| CO2I Integrated CO2 & NO2 Imaging spectrometer COM (EUMETSAT) | Current: - Future: Sentinel CO2M-A, Sentinel CO2M-B, Sentinel CO2M-C Complete: - | Being developed | Atmospheric chemistry | Pushbroom scanning spectrometer to provide relatively high spatial resolution CO2, CH4 and NO2 observations in support of estimating anthropogenic emissions of CO2 and CH4 in Copernicus. In addition, high quality NO2 and solar-induced fluorescence will be operationally delivered. | Waveband: For CO2: TOA radance measures in NIR (747-773nm), SWIR1 (1590-1675nm), SWIR2 (1990-2095nm). For NO2: VIS (405-490nm) Spatial resolution: 4km2 Swath width: 250km Accuracy: Co2 precision=0.7ppm, CH4 precision=10 ppb, No2 precision 1.5 10e15 molec/cm2 |
| COCTS China Ocean Colour & Temperature Scanner CAST | Current: HY-1C, HY-1D Future: HY-1E, HY-1F Complete: HY-1A, HY-1B | Operational | Ocean colour instruments | Ocean chlorophyll, ocean yellow substance absorbance, Sea-ice surface temperature. | Waveband: B1: 0.402 - 0.422 µm, B2: 0.433 - 0.453 µm, B3: 0.480 - 0.500 µm, B4: 0.510 - 0.530 µm, B5: 0.555 - 0.575 µm, B6: 0.660 - 0.680 µm, B7: 0.740 - 0.760 µm, B8: 0.845 - 0.885 µm, B9: 10.30 - 11.40 µm, B10: 11.40 - 12.50 µm Spatial resolution: 1.1 km Swath width: 3083 km Accuracy: |
| COMIS COMpact Imaging Spectrometer KARI (SI) | Current: STSAT-3 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Land use assessments | Waveband: 0.4-1.05µm Spatial resolution: 28m Swath width: 28 km Accuracy: |
| Compact Advanced Payload Wide Swath (CAS500-4) KARI | Current: - Future: CAS500-4 Complete: - | Being developed | High resolution optical imagers | Agricultural and forest monitoring | Waveband: VIS - NIR: 0.40 - 0.88 µm (more than 5 channels) Spatial resolution: 5m Swath width: 120km Accuracy: |
| CORA-micro ASI (NOSA) | Current: - Future: NORSAT-TD Complete: - | Being developed | Precision orbit | Demonstrate/support Satellite Laser Ranging with a new miniaturized reflector | Waveband: Spatial resolution: Swath width: Accuracy: |
| COSI Corea SAR Instrument KARI (TAS-i) | Current: KOMPSAT-5 Future: - Complete: - | Operational | Imaging microwave radars | SAR for land applications of cartography and disaster monitoring. | Waveband: microwave Spatial resolution: High: 1 m Swath width: 100 km Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|---|---|--|
| COSIS DLR | Current: - Future: CO2Image Complete: - | Approved | Atmospheric chemistry | Independent verification of reported emissions as a cornerstone toward emission accounting and reduction measures such as agreed on in the Paris climate agreement. In 2018, coal-fired power plants accounted for 30% of the global man-made carbon dioxide emissions. | Waveband: Spatial resolution: Swath width: 50m x 50 m Accuracy: |
| CPR (CloudSat) Cloud Profiling Radar (CPR) NASA | Current: CloudSat Future: - Complete: - | 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) | Current: - Future: EarthCARE Complete: - | Being developed | Cloud profile and rain radars | Measurement of cloud properties, light precipitation, vertical motion. | Waveband: Microwave: 94 GHz Spatial resolution: Range resolution: 500m (100m sample) Horizontal resolution: 800m (500m sample) Swath width: Accuracy: |
| CrIS Cross-track Infrared Sounder NOAA | Current: JPSS-1, JPSS-2 Future: JPSS-3, JPSS-4, Suomi NPP Complete: - | Operational | Atmospheric temperature and humidity sounders | Daily measurements of vertical atmospheric distribution of temperature, moisture, and pressure. MWIR non-operational on Suomi NPP effective 12 July 2021. | 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% |
| CSAR Cryogenic Solar Absolute Radiometer (CSAR) ESA (UKSA) | Current: - Future: TRUTHS Complete: - | Proposed | | | Waveband: Spatial resolution: Swath width: Accuracy: |
| CSG SAR COSMO-SkyMed di Seconda Generazione SAR ASI (MoD (Italy)) | Current: CSG-1, CSG-2 Future: CSG-3, CSG-4 Complete: - | 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) single-, dual- and quad-polarization Spatial resolution: [range x azimuth] Spotlight: 0.5x0.35 or 0.63x0.63 m (Single/Dual pol), Stripmap: 3x3 m (Single/Dual/Quad pol), ScanSAR: 4x20 or 6x40 m (Single/Dual pol) Swath width: Dual polarisation modes: Spotlight [range x azimuth]: 7.3x3.1 or 10x10 km, Stripmap: 40 km, ScanSAR: 100 or 200 km, Quad polarisation mode: 15 km. Accuracy: - |
| CWFMS Canadian Wildland Fire Monitoring Sensor CSA (NRCAN, ECCO) | Current: - Future: WildFireSat Complete: - | Being developed | Imaging multi-spectral radiometers (vis/IR) | Measurements are: Fire Radiative Power (FRP), hotspot locations, rate of spread, burned area mapping. Data products generated: 1) Fire maps, showing location, extent, and timing of forest fire events; 2) Fire characteristics, such as fire line intensity, rate of spread and fuel consumption; 3) Plume dynamics through smoke transport maps and plume heights; 4) Mass of carbon released into atmosphere. | Waveband: VIS: 0.6 – 0.7 µm (red) (possibly also VIS 0.4 - 0.6 µm); NIR: 0.8 – 0.9 µm; MWIR: 3.4 - 4.2 µm wavelength; TIR: 10.4 µm – 12.3 µm; Spatial resolution: 400 m (TIR, MWIR), and 200 m (NIR, VIS) at the geodetic sub-satellite point. Swath width: 400 km Accuracy: Temperature measurement accuracy 15 K; pointing accuracy 0.5 deg; |
| CZI Coastal Zone Imager CAST | Current: HY-1C, HY-1D Future: HY-1E, HY-1F Complete: HY-1A, HY-1B | Operational | Imaging multi-spectral radiometers (vis/IR) | Imagery of coastal regions - estuaries, tidal regions, etc. | Waveband: B1: 0.433 - 0.453, B2: 0.555 - 0.575, B3: 0.655 - 0.675, B4: 0.675 - 0.695 µm Spatial resolution: 250 m Swath width: 500 km Accuracy: |
| DAR (INCUS) Dynamic Atmospheric Radar NASA | Current: - Future: INCUS Complete: - | Being developed | Cloud profile and rain radars | Measures time-differenced profiles of radar reflectivity for convective mass flux | Waveband: Ka-band (center frequency: 35.75 and bandwidth: 2.5 MHz) Spatial resolution: 3.5 km horizontal resolution, 250 m vertical resolution Swath width: 11 km using 5-scanning beams Accuracy: |
| DCS Data Collecting System Transponder INPE | Current: SCD-1, SCD-2 Future: - Complete: - | Operational | Data collection | Data collection and communication. | Waveband: Spatial resolution: Swath width: Accuracy: |
| DCS Data Collecting System Transponder INPE (CAST) | Current: CBERS-4A Future: - Complete: CBERS-2B, CBERS-1, CBERS-2, CBERS-4 | Operational | Data collection | Data collection and communication. | Waveband: Spatial resolution: Swath width: Accuracy: |
| DCS Data Collection System ROSHYDROMET | Current: Meteor-M N2-2, Elektro-L N2, Elektro-L N3 Future: Elektro-L N4, Elektro-L N5, Meteor-M N2-6, Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3 Complete: Meteor-3M, Elektro-L N1, Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | 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 Series) Data Collection System (NOAA, GOES-16) NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U, EWS-G1, GOES-14, GOES-15 Complete: - | 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, AEB | Current: - Future: SAC-E/SABIA_MAR-1, SAC-E/SABIA_MAR-2 Complete: - | Proposed | Data collection | Environmental and meteorological data collection from ground platforms (UHF 401.62 MHz uplink / S-band downlink). | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: N/A |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|--|---|---|
| DDMI (CYGNSS) Delay Doppler Mapping Instrument (DDMI) NASA (NOAA) | Current: CYGNSS Future: - Complete: - | Operational | Other | Constellation of bistatic radar receivers using GPS satellite transmitters to detect ocean surface roughness and estimate near-surface wind speed from calm sea through hurricane force conditions and under all levels of precipitation. | Waveband: Microwave: 1.575 GHz Spatial resolution: 20-50 km (variable in ground processing) Swath width: Field of view of potential GPS specular point contacts extends 740 km cross-track in both port and starboard directions. Accuracy: wind speed RMS retrieval uncertainty: 2 m/s for winds less than 20 m/s and 10% for winds greater than 20 m/s |
| DEGIS DLR Earth Sensing Imaging Spectrometer DLR | Current: DESIS-on-ISS Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | DEGIS is a hyperspectral camera that records image data using an array of up to 240 closely spaced channels, covering the visible and near infrared portions of the spectrum (450 to 915 nanometres) with a ground resolution of approximately 90 metres. This multifaceted information allows scientists to detect changes in ecosystems and to make statements on the condition of forests and agricultural land. | Waveband: Spectral range: 450nm – 950nm (400 - 1000nm) Spectral sampling: ≈ 2.32nm Spectral channels: 240 (without binning) Spatial resolution: 79m/104m @330 km/435km orbit (min/max) Swath width: 44km/57km @330 km/435km orbit (min/max) Accuracy: |
| DMR (INCUS) Dynamic Microwave Radiometer NASA | Current: - Future: INCUS Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | Measures microwave radiances simultaneously with radar reflectivity profiles for tropical convective storms | Waveband: 4 frequencies between 150 and 190 GHz Spatial resolution: 16 km Swath width: 1000 km Accuracy: < 5K |
| DORIS-NG Doppler Orbitography and Radio-positioning Integrated by Satellite-NG CNES | Current: Sentinel-6 A Michael Freilich Future: SWOT, Sentinel-6 B Complete: Envisat, Jason-1, CryoSat, OSTM (Jason-2), CryoSat-2, Jason-3, HY-2A | 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 (NICT) | Current: GPM Core Future: - Complete: - | Operational | 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: 125m (NS, MS mode), 250m (HS mode). Horizontal resolution: 5 km at nadir Swath width: 245 km (Ku-band), 125 km (Ka band) Accuracy: Rainfall rate 0.2 mm/h |
| EFI Electric Field Instrument ESA (CSA) | Current: Swarm Future: - Complete: - | Operational | Space environment | Thermal 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 |
| EMIT Earth Surface Mineral Dust Source Investigation NASA | Current: EMIT-on-ISS Future: - Complete: - | Being developed | Hyperspectral imagers | Imaging spectroscopy from the visible to short wavelength infrared (VSWIR) to determine surface mineral composition in the Earth's arid land dust source regions. | Waveband: 400 -2500 nm at 7.4 nm sampling Spatial resolution: 60 m Swath width: 80 km @ 416km altitude Accuracy: 10% radiometric, 10% spectral, 10% spatial, 10% uniformity |
| EPIC Earth Polychromatic Imaging Camera NASA (NOAA) | Current: DSCOVR Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Diurnal measurements of ozone, sulfur dioxide, UV surface radiation, clouds, aerosols and vegetation. | Waveband: 317 - 780 nm in 10 channels Spatial resolution: 10-20 km Swath width: Whole Earth Accuracy: |
| ERM-1 Earth Radiation Measurement NRSCC (NSMC-CMA, CNSA, CAST) | Current: 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, CNSA, CAST) | Current: FY-3E Future: FY-3H Complete: - | Operational | 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) | Current: DSCOVR Future: - Complete: - | Operational | Space environment | Space Physics experiment for measuring speed and direction of electrons coming from the sun. | Waveband: Spatial resolution: Swath width: Accuracy: |
| ETM+ Enhanced Thematic Mapper Plus USGS (NASA) | Current: Landsat 7 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures surface radiance and emittance, land cover state, and change (e.g., 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 |
| EXIS Extreme Ultraviolet and X-ray Irradiance Sensors NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | 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: |
| FAI Fast Auroral Imager CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | Measures the large-scale auroral emissions in the 630-1100 nm wavelength range. The FAI imager system produces 16-bit digital images of the near infrared band at one image per second (CASSIOPE is a 3-axis stabilized platform), and the 630 nm wavelength at two images per minute, giving adequate temporal resolution to investigate the above scientific objectives. | Waveband: Visible: 630 nm NIR: 650-1100 nm Spatial resolution: 2.6 km at apogee (aurora at 110 km altitude) Swath width: N/A Accuracy: |
| FC Faraday Cup NASA | Current: DSCOVR Future: - Complete: - | Operational | Space environment | The Faraday Cup is a retarding potential particle detector that provides high time resolution solar wind proton bulk properties (wind speed, density and temperature). Instrument Measurements include: Alpha particles differential directional flux, Proton differential directional flux, Solar Wind Density, Solar Wind Temperature, and Solar Wind Velocity. | Waveband: Spatial resolution: Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|---|---|
| FCI Flexible Combined Imager EUMETSAT (ESA) | Current - Future: MTG-11 (imaging), MTG-12 (imaging), MTG-13 (imaging), MTG-14 (imaging) Complete: - | 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, I 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, 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 |
| FLORIS ESA | Current - Future: FLEX Complete: - | Approved | Imaging multi-spectral radiometers (vis/IR) | Mapping vegetation fluorescence to quantify photosynthetic activity. | Waveband: Several bands of the range 500-780 nm, with two types of spectral resolution: Low (1-2 nm) and High (0.1-0.5 nm) Spatial resolution: High spectral resolution of ~0.3 nm around the Oxygen absorption bands. Other spectral areas with less pronounced absorption features will be measured at medium spectral resolution between 0.5 and 3 nm. Swath width: 150 km swath Accuracy: |
| Fourier Transform Spectrometer ESA | Current - Future: FORUM Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measure across Earth's entire far-infrared part of the electromagnetic spectrum | Waveband: Spatial resolution: Swath width: Accuracy: |
| GAP GPS receiver-based Attitude, Position, and profiling experiment (GAP) CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | Used for spacecraft position and attitude determination and for ionospheric radio occultation profiling measurements in which the relative phase delay of the measured L1 and L2 signals (at frequencies of 1.57542 GHz and 1.2276 GHz, respectively) from different satellites of the GPS constellation will be used to determine the electron density profile of the ionosphere using tomographic techniques. The GAP is turned on an average of 10% of the time, following a schedule devised by the science team. | Waveband: 1.57542 GHz and 1.2276 GHz Spatial resolution: N/A Swath width: N/A Accuracy: |
| GAS Greenhouse gases Absorption Spectrometer CAST (NSMC-CMA, CNSA) | Current: FY-3D Future: FY-3F, FY-3H Complete: - | Operational | Atmospheric chemistry | Measures greenhouse gases. | Waveband: Spatial resolution: Swath width: Accuracy: |
| GEDI Global Ecosystem Dynamics Investigation Lidar NASA | Current: GEDI-on-ISS Future: - Complete: - | Operational | Lidars | This project will use a laser-based system to study a range of climates, including the observation of the forest canopy structure over the tropics, and the tundra in high northern latitudes. | Waveband: Spatial resolution: Swath width: Accuracy: |
| GEMS Geostationary Environment Monitoring Spectrometer KARI, NIER (BATC) | Current: GEO-KOMPSAT-2B Future: - Complete: - | Operational | Atmospheric chemistry | Measurements of atmospheric chemistry, precursors of aerosols and ozone in particular, in high temporal and spatial resolution over Asia. | Waveband: 0.30 µm - 0.50µm Spatial resolution: 7 x 8 km at Seoul Swath width: FOR (Field Of Regard) is 5000km x 5000km Accuracy: |
| Geoton-L1 (2) Geoton-L1 ROSKOSMOS | Current - Future: Resurs-P N4, Resurs-P N5 Complete: Resurs-P N1, Resurs-P N2, Resurs-P N3 | Operational | High resolution optical imagers | Multispectral images of land surfaces and Oceans. | Waveband: 0.58 - 0.8 µm, 0.45 - 0.52 µm, 0.52 - 0.60 µm, 0.61 - 0.68 µm, 0.72 - 0.80 µm, 0.80 - 0.90 µm Spatial resolution: 0.7 m; 3-4 m Swath width: 38 km Accuracy: |
| GERB Geostationary Earth Radiation Budget EUMETSAT (RAL, ESA) | Current: Meteosat-9, Meteosat-10, Meteosat-11, Meteosat-8 Future: - Complete: - | 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) | Current: Elektro-L N2, Elektro-L N3 Future: Elektro-L N4, Elektro-L N5 Complete: Elektro-L N1 | Operational | Space environment | Monitoring and forecasting of solar activity, 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) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | Operational | Space environment | Space Environmental Monitoring (SEM), heliogeophysical. | Waveband: Spatial resolution: Swath width: Accuracy: |
| GGAK-VE Module for Geophysical Measurements ROSHYDROMET (ROSKOSMOS) | Current: Arctica-M N1 Future: Arctica-M N2 Complete: - | Operational | Space environment | Monitoring and forecasting of solar activity, 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: |
| GIIRS Geostationary Interferometric Infrared Sounder NSMC-CMA | Current: FY-4A, FY-4B Future: FY-4C, FY-4D, FY-4E, FY-4F, FY-4G Complete: - | Operational | Atmospheric temperature and humidity sounders | Measurements of three dimensional atmospheric structure. Large-area, continuous, fast, and accurate vertical air soundings of temperature and humidity. Subsequent units have slightly different specifications. | Waveband: LWIR: 700-1130 cm-1, 538 channels S/MIR: 1650-2250 cm-1, 375 channels VIS: 0.55-0.75 µm, 1 channel Spatial resolution: LWIR/S/MIR: 16km SSP VIS: 2km SSP Swath width: Accuracy: 1.5k (3σ) radiation, 10 ppm (3σ) spectrum |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|--|--|---|
| GLIMR Instrument Geosynchronous Littoral Imaging and Monitoring Radiometer (GLIMR) NASA | Current: - Future: GLIMR Complete: - | Being developed | Ocean colour instruments | GLIMR will make observations of rapidly evolving phytoplankton dynamics and hazards such as Harmful Algal Blooms (HABs) and oil spills in the Gulf of Mexico and other selected coastal regions of North and South America | Waveband: UV-VIS-NIR: 350-1020 nm at 5 nm sampling Spatial resolution: 300 m Swath width: FOV: 20.8° N-S and E-W Accuracy: Landmark imaging capability for geolocation reconstruction of science data to within 33% of the local ground sample distance (LGSD). Spectrometer pointing line of sight stability of 20% of the LGSD. |
| GLM GEO Lightning Mapper NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | Lightning sensors | Detect total lightning flash rate over near full disk. | Waveband: NIR at 777.4 nm Spatial resolution: 10 km Swath width: Accuracy: 0.7 |
| GMI GPM Microwave Imager NASA | Current: GPM Core Future: - Complete: - | Operational | 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 (Core Observatory) Accuracy: 0.65 - 1.5 K |
| GNOS GNSS Radio Occultation Sounder CAST (NSMC-CMA, CNSA) | Current: FY-3D, FY-3E Future: FY-3F, FY-3RM-1, FY-3H, FY-3RM-2, FY-3I, FY-3C Complete: - | Operational | Atmospheric temperature and humidity sounders | Atmospheric sounding for weather forecasting. | Waveband: Spatial resolution: Swath width: Accuracy: |
| GNSS POD Receiver ESA | Current: Sentinel-6 A Michael Freilich Future: Sentinel-6 B Complete: - | Operational | Precision orbit | Precision orbit determination. | Waveband: L1/L2/L5 Spatial resolution: Swath width: Accuracy: |
| GNSS Reflectometer (HydroGNSS) GNSS Reflectometer ESA (UKSA) | Current: - Future: HydroGNSS Complete: - | Proposed | Other | | Waveband: Spatial resolution: Swath width: Accuracy: |
| GNSS-RO Receiver GNSS Radio Occultation Receiver NASA | Current: Sentinel-6 A Michael Freilich Future: Sentinel-6 B Complete: - | Operational | Atmospheric temperature and humidity sounders | Measurement of bending angles of GNSS satellite signals occulted by Earth's atmosphere for retrieval of temperature and humidity profiles. | Waveband: L1/L2/L5 Spatial resolution: 0.15 to 1.5 km Swath width: Accuracy: Bending Angle measurement accuracy: from 1 to 20 mRad (depending on altitude) |
| GOES Comms Communications package on GOES NOAA | Current: GOES-14, GOES-15, EWS-G1 Complete: - | Operational | Communications | | Waveband: Spatial resolution: Swath width: Accuracy: |
| GOME-2 Global Ozone Monitoring Experiment - 2 EUMETSAT (ESA) | Current: Metop-B, Metop-C Future: - Complete: Metop-A | Operational | Atmospheric chemistry | Measurement of total column amounts and stratospheric and tropospheric profiles of ozone. Also amounts of H2O, 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 (ms), Outgoing short wave radiation and solar irradiance: 5 W/m2, Trace gas profile: 10 - 20%, Specific humidity profile: 10 - 50 g/kg |
| GPS Receiver (Swarm) ESA | Current: Swarm Future: - Complete: - | Operational | Precision orbit | Provides position and timing determination | 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 | Current: Jason-3 Complete: - | Operational | Precision orbit | Precision orbit determination. | Waveband: L1/L2/L5 Spatial resolution: Swath width: Accuracy: |
| GPSRO (Terra-SAR) GPS Radio Occultation System NASA | Current: TerraSAR-X Future: - Complete: - | Operational | Atmospheric temperature and humidity sounders | Measurements of atmospheric temperature, pressure and water vapour content. | Waveband: Spatial resolution: Swath width: Accuracy: |
| GRAS GNSS Receiver for Atmospheric Sounding EUMETSAT (ESA) | Current: Metop-B, Metop-C Future: - Complete: Metop-A | Operational | Atmospheric temperature and humidity sounders | GNSS receiver for atmospheric temperature and humidity profile sounding. | Waveband: L-Band 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 |
| GSA (1) Hyperspectral imaging equipment ROSKOSMOS | Current: - Future: Resurs-P N4, Resurs-P N5 Complete: Resurs-P N1, Resurs-P N2, Resurs-P N3 | Operational | Hyperspectral imagers | Land surface monitoring | Waveband: 0.43 - 0.97 µm, 96-255 spectral bands Spatial resolution: 25-30 m Swath width: 30 km Accuracy: 5 |
| HARP2 Hyper-Angular Rainbow Polarimeter NASA (JMD) | Current: - Future: PACE Complete: - | Being developed | Multiple direction/polarisation radiometers | Polarimeter for measuring aerosol optical properties, clouds and aerosol types. | Waveband: 440, 550, 670 & 870nm bands Spatial resolution: 3.0 km Swath width: Wide swath ±47°. Accuracy: |
| HEPD High Energy Particle Detector ASI | Current: CSES Future: - Complete: - | Operational | Space environment | Fluxes of electrons (3 - 100 MeV), protons (30 - 200 MeV) and light nuclei. Measurement of the increase of the electron and proton fluxes due to short-time perturbations of the radiation belts caused by solar, terrestrial and anthropic phenomena. | Waveband: Spatial resolution: N/A Swath width: N/A Accuracy: N/A |
| High Resolution Optical Sensor (CAS500-1) KARI (NGII) | Current: CAS500-1 Future: - Complete: - | Operational | High resolution optical imagers | Cartography, land use and planning | Waveband: Spatial resolution: 1m Swath width: Accuracy: |
| High Resolution Optical Sensor (CAS500-2) KAI (NGII, KARI) | Current: - Future: CAS500-2 Complete: - | Operational | High resolution optical imagers | Cartography, land use and planning | Waveband: Spatial resolution: 1m Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|--------------------|---|--|--|
| Himawari Comms Communications package for Himawari JMA | Current: Himawari-8, Himawari-9 Future: - Complete: - | Operational | Communications | | Waveband: Spatial resolution: Swath width: Accuracy: |
| Himawari DCS Data Collection System for Himawari JMA | Current: Himawari-8, Himawari-9 Future: - Complete: - | Operational | Data collection | | Waveband: Spatial resolution: Swath width: Accuracy: |
| HiRAIS High-Resolution Advanced Imaging System MBRSC (UAE SA) | Current: DubaiSat-2 Future: - Complete: - | Operational | High resolution optical imagers | Biomass, FAPAR, fraction of vegetated land, land cover, LAI, NDVI, vegetation type. | Waveband: Spectral Resolutions: Pan: 550-900nm, MS1: 450-520nm (blue), MS2: 520-590nm (green), MS3: 630- 690nm (red), MS4: 770-890nm (NIR). Spatial resolution: 1m for panchromatic imagery and 4m in four multispectral bands. Swath width: 12km Accuracy: |
| HIRAS Hyperspectral Infrared Atmospheric Sounder NRSCC (CNSA, CAST) | Current: FY-3D, FY-3E Future: FY-3F, FY-3H, FY-3I Complete: - | Operational | Imaging multi- spectral radiometers (passive microwave) | | Waveband: Spatial resolution: Swath width: Accuracy: |
| HIRI High-Resolution Imager CNES | Current: Pleiades 1A, Pleiades 1B Future: - Complete: - | 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/4 High Resolution Infra-red Sounder/4 EUMETSAT, NOAA | Current: NOAA-19, Metop-B Future: - Complete: Metop-A, NOAA-18 | 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: |
| HIS Hyperspectral imaging Spectrometer (HIS) ESA (UKSA) | Current: - Future: TRUTHS Complete: - | Proposed | | | Waveband: Spatial resolution: Swath width: Accuracy: |
| HRMX High Resolution Multi Spectral ISRO | Current: CARTOSAT-2E, CARTOSAT-2C Future: - Complete: - | Operational | 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 Swath width: 10 km Accuracy: |
| HRWS X-Band Digital Beamforming SAR DLR | Current: - Future: HRWS SAR Complete: - | Proposed | 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, up to 1200 MHz bandwidth, fully polarimetric Spatial resolution: Spotlight: 0.25 x 0.25 m, Stripmap: 1 x 1 m ScanSAR: 4 x 2 m Swath width: Spotlight: 10 km, Stripmap: 50 km, ScanSAR: up to 500 km Accuracy: |
| HSC High Sensitivity Camera CONAE, AEB | Current: - Future: SAC- E/SABIA_MAR-1, SAC- E/SABIA_MAR-2 Complete: - | Proposed | Imaging multi- spectral radiometers (vis/IR) | Low light detection applications | Waveband: VIS-NIR Panchromatic Spatial resolution: 250m Swath width: 500km Accuracy: |
| HSI Hyperspectral Imager DLR | Current: EnMAP Future: - Complete: - | Approved | Hyperspectral imagers | 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 HyperSpectral Instrument COM | Current: - Future: Sentinel CHIME- A, Sentinel CHIME-B Complete: - | Being developed | Hyperspectral imagers | Pushbroom-type grating Imaging Spectrometer with high Signal-to-noise Ratio and data uniformity to derive quantitative surface characteristics supporting the monitoring, implementation and improvement of a range of policies in the domain of raw materials, agriculture, soils, food security, biodiversity, environmental degradation and hazards, inland and coastal waters, snow, forestry and the urban environment | Waveband: > 200 bands (400-2500 nm); FWHM <= 10 nm; SSI <= 10 nm Spatial resolution: 30m Swath width: 130km Accuracy: Radiometric accuracy for Level-1B data: 5% absolute, 1% relative. On a best effort basis within 1760- 1950 nm and within 2450-2500 nm. |
| HSI-2 (HJ-2A) Hyper Spectrum Imager 2 CAST | Current: HJ-2A, HJ-2B Future: - Complete: - | 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: |
| HYC HYperspectral Camera ASI | Current: PRISMA Future: - Complete: - | Operational | Hyperspectral imagers | 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 |
| HyperScout Hyperspectral VNIR imager ESA (NSO) | Current: GOMX4 Future: - Complete: - | Operational | Imaging multi- spectral radiometers (vis/IR) | Demonstration of hyperspectral operations on a Cubesat. Demonstration of early warning capability leveraging heavy onboard processing for flooding, change detection, crop water factor, vegetation monitoring. Hyperspectral VNIR. | Waveband: VNIR 400 - 1000 nm, 45 bands, 16 nm bandwidth Spatial resolution: Swath = 200 km, GSD = 70 m Swath width: 200 km Accuracy: 5-10% |
| HyperScout-2 Hyperspectral VNIR and multispectral TIR imager ESA (NSO) | Current: PhiSat-1 Future: - Complete: - | Operational | Imaging multi- spectral radiometers (vis/IR) | Demonstration of hyperspectral and thermal imaging on a 6U Cubesat. Demonstration of Artificial Intelligence accelerator. Cloud screening in-orbit will be the first AI application. Other applications are: high resolution by data fusion between hyperspectral and thermal; evapotranspiration and agriculture applications; thermal inertia and soil moisture; Urban Heat Island; assisting search and rescue for pyroclastic flow/surge deposits, oil spills; fire monitoring, underground fires, and, water quality. | Waveband: VNIR 400 - 1000 nm, 45 bands, 16 nm bandwidth TIR 8 - 14 µm, 4 bands, 1.1 µm and 6 µm bandwidth Spatial resolution: Swath = 310 km, GSD VNIR = 75 m, GSD TIR = 390 m Swath width: 310 Accuracy: 5-10% |
| Hyperspectral Detector CAST | Current: Goumang Future: - Complete: - | Operational | Hyperspectral imagers | Detect and measure vegetation biomass, atmospheric aerosol and chlorophyll fluorescence, and can also obtain the remote- sensing information of global forest carbon sinks. | Waveband: Spatial resolution: Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-----------------|--|---|--|
| IASI Infrared Atmospheric Sounding Interferometer EUMETSAT (CNES) | Current: Metop-B, Metop-C Future: - Complete: Metop-A | Operational | Atmospheric temperature and humidity sounders | Measures tropospheric moisture and temperature, column integrated contents of ozone, carbon monoxide, methane, nitrous oxide and other minor gases which affect tropospheric chemistry. Also measures sea surface and land temperature. | Waveband: MWIR - TIR: 645 to 2760 cm ⁻¹ or 3.62 - 15.5 μm (8461 spectral samples) 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 - New Generation EUMETSAT (UKSA, CNES) | Current: - Future: METOP-SG A1, METOP-SG A2, METOP-SG A3 Complete: - | Being developed | Atmospheric temperature and humidity sounders | Measures profiles of atmospheric temperature, humidity, ozone, carbon monoxide, columns of methane, nitrous oxide, and other minor gases, and sea, ice, and land surface temperature and emissivity. | Waveband: MWIR - TIR: 645 to 2760 cm ⁻¹ or 3.62 - 15.5 μm (16921 spectral samples) Spatial resolution: Vertical: 1 - 30 km, Horizontal: 25 km Swath width: 2052 km Accuracy: TBC |
| ICI Ice Cloud Imager EUMETSAT (ESA) | Current: - Future: METOP-SG B1, METOP-SG B2, METOP-SG B3 Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | Measures cloud ice content, snowfall detection, precipitation content, snowfall rate near surface and water vapour profiles | Waveband: 11 channels from 183 to 664 GHz Spatial resolution: Footprint size 15 km (Threshold) Swath width: 1700km Accuracy: |
| IIR Imaging Infrared Radiometer CNES | Current: CALIPSO Future: - Complete: - | 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 IR-Fourier spectrometer ROSHYDROMET (ROSKOSMOS) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-3M, Meteor-M N2-1, Meteor-M N2 | Operational | 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 than 5000 spectral channels Spatial resolution: 35000-100000 m Swath width: 1000 km; 1500 km; 2000 km; 2500 km Accuracy: |
| IKFS-3 Advanced Fourier spectrometer ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 than 8000 spectral channels Spatial resolution: 35 - 100 km Swath width: 1000/2000 km Accuracy: 0.5 K |
| Imager NOAA | Current: GOES-14, GOES-15, EWS-G1 | 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 3D) Very High Resolution Radiometer ISRO | Current: INSAT-3DR Future: INSAT-3DS, INSAT-3D Complete: - | Operational | 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: |
| Imaging Microwave Radiometer COM | Current: - Future: Sentinel CIMR-B, Sentinel CIMR-A Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | A conical scanning total power radiometer operating in 5 bands (L/C/X/Ku/Ka) to provide high-spatial resolution microwave imaging radiometry measurements and derived products with continuous global coverage and sub-daily revisit in the polar regions and adjacent seas | Waveband: L / C / X / Ku / Ka bands Spatial resolution: 60km for L-band; 15km for C and X bands; 5 km for Ku and Ka-bands Swath width: >1900km Accuracy: PTAR: -25 dB DTAR: -23 dB Radiometric stability: 0.5 dB (3 sigma) |
| Infrared Earth Horizon Sensor CAST | Current: Yunhai-1 03 Future: - Complete: - | Operational | Lightning sensors | Find where the horizon of our planet is to have the precise idea of the satellite orientation. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Infrared Scanning Radiometer CAST | Current: Yunhai-1 03 Future: - Complete: - | Operational | Atmospheric temperature and humidity sounders | Measurement of temperatures for meteorology purpose. | Waveband: Spatial resolution: Swath width: Accuracy: |
| IPDA LIDAR Integrated Path Differential Absorption Light Detection and Ranging Instrument DLR (CNES) | Current: - Future: MERLIN Complete: - | Approved | 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 Camera (ZY-1-02E) Longwave infrared camera CRESDA | Current: ZY-1 02E Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | | Waveband: Spatial resolution: Swath width: Accuracy: |
| IRAS InfraRed Atmospheric Sounder NRSCC (NSMC-CMA, CNSA, CAST) | Current: 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 |
| IRIS Interferometric Radar Altimeter for Ice and Snow COM | Current: - Future: Sentinel CRISTAL-A, Sentinel CRISTAL-B Complete: - | Being developed | Radar altimeters | Ku-band Interferometric Synthetic Aperture Radar Altimeter (with added Ka-band channel for snow depth retrieval and in combination with AMR-CR MW Radiometer for ice& snow classification and wet troposphere correction) to cover the needs for continuous monitoring of the sea ice thickness and land ice elevation measurement after Cryosat-2 with enhanced performance. | Waveband: Ku-band and Ka-band Spatial resolution: up to 0.5 m (along track resolution with fully-focused SAR processing). Various degrees of averaging depending on surface Swath width: N/A Accuracy: 23 arc sec (Angle of Arrival error); 3 cm on freeboard; 15 cm on sea ice thickness; 2 m on land ice surface elevation; 3.5 cm on sea surface height. |
| IRM Imaging and Rapid-scanning ion Mass spectrometer CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | Measures the composition and 3-dimensional velocity distributions of ions. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|--|---|---|
| IRMS-2 (HJ-2) Infrared Multispectral Scanner - 2 CAST | Current: HJ-2A, HJ-2B Future: - Complete: - | 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: |
| IRS Infra-Red Sounder EUMETSAT (ESA) | Current: - Future: MTG-S1 (sounding), MTG-S2 (sounding) Complete: - | 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 alternately 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) | Current: CBERS-4 Future: - Complete: - | Operational | 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: |
| IVM Ion Velocity Meter NOAA (UCAR) | Current: COSMIC-2 FM1, COSMIC-2 FM2, COSMIC-2 FM3, COSMIC-2 FM4, COSMIC-2 FM5, COSMIC-2 FM6 Future: - Complete: - | Operational | Space environment | Measures the in-situ plasma density, ion temperature and composition, and drift velocity. Used for modeling the ionosphere to determine electric fields that could impact other systems (e.g. GPS radio signals). | Waveband: Spatial resolution: Swath width: Accuracy: |
| K-line Imager SANSa | Current: ZACube-2 Future: - Complete: - | Operational | High resolution optical imagers | ZACube-2 is fitted with a K-line fire detection imager as its hosted payload. The Imager consists of a combination of two NIR cameras to allow for potential fires to be detected. | Waveband: Near Infrared (NIR) Spatial resolution: 56 m Swath width: 71 km Accuracy: |
| Ka-band Radar Interferometer (KaRIN) NASA (CNES) | Current: - Future: SWOT Complete: - | Being developed | Radar altimeters | Swath mapping radar altimeter that provides measurements for surface water. | Waveband: 35.75 GHz Center Freq / 200 MHz Bandwidth Spatial resolution: Vertical resolution is 2 cm Swath width: 50 km Accuracy: 8.2 cm height accuracy required |
| Kasatka-R ROSKOSMOS | Current: - Future: Obzor-R N1 Complete: - | Approved | Imaging microwave radars | Disaster monitoring, sea surface monitoring, information support of environmental management | Waveband: X-band Spatial resolution: 1-500 m Swath width: 10-750 km Accuracy: |
| KHCS KhalifaSat Camera System MBRSC (UAE SA) | Current: KhalifaSat Future: - Complete: - | Operational | High resolution optical imagers | Biomass, FAPAR, fraction of vegetated land, land cover, LAI, NDVI, vegetation type. | Waveband: 552 - 892 nm (PAN-1), 554 - 897 nm (PAN-2) 457 - 520 nm (MS1-1), 460 - 521 nm (MS1-2) 521 - 591 nm (MS2-1), 523 - 592 nm (MS2-2) 629 - 691 nm (MS3-1), 629 - 691 nm (MS3-2) 766 - 884 nm (MS4-1), 770 - 888 nm (MS4-2) Spatial resolution: 0.75m for panchromatic imagery and 3m in four multispectral bands. Swath width: 12km Accuracy: |
| KMSS Multispectral Imager (VIS) system ROSKOSMOS (ROSHYDROMET) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-3M, Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | Operational | Imaging multi-spectral radiometers (vis/IR) | Multispectral images of land & sea surfaces and ice cover. | Waveband: 0.52 - 0.57 μm ; 0.63-0.68 μm ; 0.76-0.90 μm Spatial resolution: 60 m - 120 m Swath width: 1000 km Accuracy: |
| KShMSA-SR Medium resolution wide capture multispectral optical sensor ROSKOSMOS | Current: - Future: Resurs-P N4, Resurs-P N5 Complete: Resurs-P N1, Resurs-P N2, Resurs-P N3 | Operational | Imaging multi-spectral radiometers (vis/IR) | Land surface and ocean monitoring | Waveband: 0.43 - 0.7 μm ; 0.43 - 0.51 μm ; 0.51 - 0.58 μm ; 0.60 - 0.70 μm ; 0.70 - 0.80 μm ; 0.80 - 0.90 μm ; Spatial resolution: 59,4 m, 118,8 m Swath width: 440 km Accuracy: |
| KShMSA-VR High resolution wide capture multispectral optical sensor ROSKOSMOS | Current: - Future: Resurs-P N4, Resurs-P N5 Complete: Resurs-P N1, Resurs-P N2, Resurs-P N3 | Operational | Imaging multi-spectral radiometers (vis/IR) | Land surface and ocean monitoring | Waveband: 0.43 - 0.7 μm ; 0.43 - 0.51 μm ; 0.51 - 0.58 μm ; 0.60 - 0.70 μm ; 0.70 - 0.80 μm ; 0.80 - 0.90 μm ; Spatial resolution: 11,9 m; 23,8 m Swath width: 100 km Accuracy: |
| L-band Radiometer (SMAP) NASA | Current: SMAP Future: - Complete: - | Operational | 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 COM | Current: - Future: Sentinel ROSE-L B, Sentinel ROSE-L A Complete: - | Being developed | Imaging microwave radars | L-band SAR instrument offering full polarimetry, high spatial resolution, high sensitivity, low ambiguity ratios and capability for repeat-pass & single-pass cross-track interferometry to measure surface deformation of vegetated terrain, soil moisture, land cover classification, crop type discrimination and its temporal analysis. Furthermore, it will monitor Polar ice sheets and ice caps, and the sea-ice conditions (i.e. type, drift, deformation, concentration, lead fraction), as well as contribute to the European maritime situational awareness. | Waveband: L-band (1.215 - 1.3 GHz) Spatial resolution: 50m2 (dual-pol) Swath width: 260km Accuracy: Radiometric accuracy 1.5 dB (3 sigmas) NESZ: -28 dB PTAR: -25 dB DTAR: -23 dB Radiometric stability: 0.5 dB (3 sigma) |
| L-Band SAR L-Band Synthetic Aperture Radar DLR (HRC) | Current: - Future: TanDEM-L Complete: - | Proposed | Imaging microwave radars | Global observation of dynamic processes in the bio-, cryo-, geo and hydrosphere. | Waveband: L-Band 23.6 cm Spatial resolution: Swath width: Accuracy: |
| L-band SAR (NISAR) L-band Synthetic Aperture Radar (SAR) (NISAR) NASA (ISRO) | Current: - Future: NISAR Complete: - | Approved | 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: Microwave: 1.25 GHz Spatial resolution: 10m resolution Swath width: 240 km (12-day repeat and global coverage) Accuracy: TBD |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|---|--|
| Land Surface Temperature Radiometer COM | Current: - Future: Sentinel LSTM-A, Sentinel LSTM-B Complete: - | Being developed | Imaging multi-spectral radiometers (vis/IR) | VNIR/SWIR/TIR radiometer with three independent focal planes fed by a single telescope to acquire images of all land and coastal areas with high radiometric accuracy and spatial resolution. Acquisition are during day and night in TIR bands and during day in VNIR/SWIR bands. Monitoring evapotranspiration (ET) rate at European field scale by capturing the variability of Land Surface Temperature (LST) (and hence ET) enabling more robust estimates of field-scale water productivity. Supporting a range of additional services benefitting from TIR observations (e.g. soil composition, coastal zone management, High-Temperature Events (HTE), urban heat islands). | Waveband: VNIR-0: 425 - 555 nm, VNIR-1: 635 - 695 nm, VNIR-2: 845 - 885 nm, VNIR-3: 925 - 965 nm, SWIR-1: 1350 - 1410 nm, SWIR-2: 1520 - 1700 nm, TIR-1: 8420 - 8780 nm, TIR-2: 8720 - 9080 nm, TIR-3: 9020 - 9380 nm, TIR-4: 10500 - 11300 nm, TIR-5: 11530 - 12470 nm Spatial resolution: ~37m at nadir / ~50m (at swath edge) Swath width: 734km Accuracy: NESZ: -28 dB |
| LandIS Landsat Next Instrument Suite NASA (USGS) | Current: - Future: Landsat-Next Complete: - | Proposed | Imaging multi-spectral radiometers (vis/IR) | Measures surface radiance, land cover state and change (e.g., vegetation type), and longwave thermal infrared surface emittance. Used as multi-purpose imagery for land applications. | Waveband: VNIR and SWIR: 21 bands from 0.41 - 2.3 µm; TIR: 5 bands from 8.3 - 12 µm Spatial resolution: VNIR and SWIR (broad bands): 10 m; VNIR and SWIR (narrow bands): 20 m; Atmospheric and TIR: 60 m Swath width: Accuracy: Absolute geodetic accuracy of 30 m; relative geodetic accuracy of 9 m (excluding terrain effects); and geometric accuracy of 8 m or better |
| Laser Radar CAST | Current: Goumang Future: - Complete: - | Operational | Lidars | Detect and measure vegetation biomass, atmospheric aerosol and chlorophyll fluorescence, and can also obtain the remote-sensing information of global forest carbon sinks. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Laser Reflectors CNES | Current: STELLA, STARLETTE Future: - Complete: - | 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 | Current: Swarm, CryoSat-2 Future: - Complete: - | Operational | Precision orbit | Measures distance between the satellite and the laser tracking stations. | Waveband: Spatial resolution: Swath width: Accuracy: |
| LCCRA (LARES) Laser Corner Cube Reflector Assembly ASI | Current: LARES Future: - Complete: - | Operational | Precision orbit | Accuracy measurements on Lense-Thirring effect and baseline tracking data for General Relativity study and 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 |
| LCCRA (LARES-2) Laser Corner Cube Reflector Assembly ASI | Current: LARES-2 Future: - Complete: - | Operational | Precision orbit | Accuracy measurements on Lense-Thirring effect and baseline tracking data for General Relativity study and precision geodesy. Also for calibration of radar altimeter bias. Retro-reflectors are smaller (about 1 inch in diameter) than those mounted onboard LARES-1 and their number is much greater (about 300). | Waveband: VIS: 400 - 750 nm Spatial resolution: N/A Swath width: N/A Accuracy: 2 cm overhead ranging |
| LI Lightning Imager EUMETSAT (ESA) | Current: - Future: MTG-11 (imaging), MTG-12 (imaging), MTG-13 (imaging), MTG-14 (imaging) Complete: - | 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 ⁻² sr ⁻¹ during the night, 16.7 mWm ⁻² sr ⁻¹ during the day), Radiance accuracy: 10% for radiances higher than 70 mWm ⁻² sr ⁻¹ , 7 mWm ⁻² sr ⁻¹ for |
| Libera NASA | Current: - Future: JPSS-3 Complete: - | Being developed | Earth radiation budget radiometers | 5-year design mission. The mission focuses on understanding the flow of energy out of the planet and how it changes over time. | Waveband: Libera will measure solar radiation with wavelengths between 0.3 and 5 microns reflected by the Earth system and infrared radiation with wavelengths between 5 and 50 microns emitted from the Earth system as it exits the top of the atmosphere. The sensor will also measure the total radiation leaving the Earth system at all wavelengths from 0.3 to 100 microns. An innovative additional "split shortwave" channel measuring radiation between 0.7 and 5 microns has been added to enable new Earth radiation budget science. Spatial resolution: Swath width: Accuracy: |
| LIS Lightning Imaging Sensor NASA | Current: LIS-on-ISS Future: - Complete: - | 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 | Current: RESOURCESAT-2A Future: - Complete: RESOURCESAT-1, RESOURCESAT-2 | 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 | Current: RESOURCESAT-2A Future: - Complete: RESOURCESAT-1, RESOURCESAT-2 | 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: |
| LISS-V Linear Imaging Self Scanner-V ISRO | Current: - Future: RESOURCESAT-3S, RESOURCESAT-3SA Complete: - | Being developed | High resolution optical imagers | Vegetation monitoring, improved crop discrimination, crop yield, disaster monitoring and rapid assessment of natural resources. | Waveband: VIS: Band 2: 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: 2.5 Swath width: Accuracy: |
| Liulin-AR 256 channels Spectrometer CONAE | Current: - Future: SAC-E/SABIA_MAR-1, SAC-E/SABIA_MAR-2 Complete: - | Approved | Space environment | Deposited energy from primary and secondary particles - Radiation environment | Waveband: N/A Spatial resolution: N/A Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|--|--|
| LLI Low Light Imager NDRE (NOSA) | Current: - Future: NORSAT-4 Complete: - | Being developed | Other | Imager for vessel detection in low light conditions | Waveband: Spatial resolution: Swath width: Accuracy: |
| LMI Lightning Mapping Imager NRSCC (NSMC-CMA, CNSA, CAST) | Current: FY-4A, FY-4B Future: FY-4C, FY-4D, FY-4E, FY-4F, FY-4G Complete: - | Operational | 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 |
| LOTUSat SAR VAST | Current: - Future: LOTUSat 1 Complete: - | Being developed | Imaging microwave radars | The LOTUSat 1 SAR instrument is designed for land cover measurements and applications. | Waveband: X-band SAR. Spatial resolution: Spotlight/1m/10km, Stripmap/2m/12km, ScanSAR/16m/50km Swath width: Accuracy: |
| LRA Laser Retroreflector Array NASA (ASI) | Current: Jason-3 | 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 | Current: LAGEOS-1, LAGEOS-2 Future: - Complete: - | 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 |
| LRA (Sentinel-6) Laser Retroreflector Array (Sentinel-6) NASA (NOAA, ESA, EUMETSAT) | Current: Sentinel-6 A Michael Freilich Future: Sentinel-6 B Complete: - | Operational | Precision orbit | | Waveband: Spatial resolution: Swath width: Accuracy: |
| LRI Laser Ranging Instrument NASA (DLR, GFZ) | Current: GRACE-FO Future: - Complete: - | Operational | Gravity instruments | Inter-satellite ranging measurement to picometer level to be used to estimates for global models of the mean and time variable Earth gravity field. | Waveband: Wavelength - 1.064 x 10 ⁻⁶ m Spatial resolution: TBD - Tech demo for GRACE-FO, Class C Instrument for MC P1 Swath width: N/A Accuracy: TBD |
| LRIT Low-Rate Information Transmission NOAA | Current: NOAA-19 Future: - Complete: GOES-11, GOES-12, GOES-14, GOES-15, EWS-G1 | Operational | Communications | Follow-on from the Weather Facsimile (WEFAX) Processing System. | Waveband: Spatial resolution: Swath width: Accuracy: |
| m-NLP multi-Needle Langmuir Probe NOSA | Current: NORSAT-1 Future: - Complete: - | Operational | Space environment | m-NLP measures the plasma around the Earth at a higher resolution than other Langmuir probe instruments that have been flown in space. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MAESTRO Measurements of Aerosol Extinction in the Stratosphere and Troposphere Retrieved by Occultation CSA | Current: SCISAT-1 Future: - Complete: - | Operational | Atmospheric chemistry | Chemical processes involved in the depletion of the ozone layer, and now including a high quality water vapour data product. | Waveband: UV - NIR: 0.285 - 1.03 μm (1 - 2 nm spectral resolution) Spatial resolution: Approx 1 - 2 km vertical Swath width: Accuracy: |
| MAG Magnetometer NOAA (NASA) | Current: - Future: SWFO-L1 Complete: - | Proposed | Magnetic field | | Waveband: Spatial resolution: Swath width: Accuracy: |
| Magnetometer (NOAA) Magnetometer NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | Magnetic field | | Waveband: Spatial resolution: Swath width: Accuracy: |
| MAIA Multi-Angle Imager for Aerosols NASA | Current: - Future: MAIA Complete: - | Approved | Imaging multi-spectral radiometers (vis/IR) | Pushbroom spectropolarimetric camera on a 2-axis gimbal for multiangle viewing, frequent revisits over targets, and inflight calibration. Major metropolitan areas are sampled with sub-km spatial resolution to study impacts of different types of particulate matter on human health. | Waveband: 365, 387, 415, 442*, 550, 645*, 749, 762.5, 866, 945, 1040*, 1610, 1885, and 2125 nm (*polarimetric) Spatial resolution: 250 m (@ 740 km orbit altitude) Swath width: 237 km @ nadir Accuracy: <4% (radiometric uncertainty), < 0.005 degree of linear polarization uncertainty |
| MAP Multi-Angular Multi-band Polarimeter COM (EUMETSAT) | Current: - Future: Sentinel CO2M-A, Sentinel CO2M-B, Sentinel CO2M-C Complete: - | Being developed | Atmospheric chemistry | Multi-angle polarimeter for supporting the CO2 and CH4 retrieval allowing to accurately estimate the effective light path effects of aerosol. Relatively high spatial resolution and accurate aerosol information will be operationally delivered. | Waveband: TOA radiances in 6 narrow filter bands (410-865nm) Spatial resolution: 2*2 km ² (at nadir) Swath width: 300km Accuracy: DoLP systematic error < 0.0025 |
| MBEI Multi-Band Earth Imager NSAU | Current: Sich 2-30 Future: - Complete: 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 $\pm 35^\circ$ from nadir Accuracy: 8 bits |
| MCP Meteorological Communications Package (MCP) | Current: - Future: - Complete: - | Operational | Communications | Meteorological Communications Package (MCP) onboard Metop series satellites. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MERSI Medium Resolution Spectral Imager NRSCC (NSMC-CMA, CNSA, CAST) | Current: 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, CNSA, CAST) | Current: FY-3D Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measurement of vegetation indexes and ocean colour. | Waveband: Spatial resolution: Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-----------------|--|---|---|
| MERSI-3 Improved Medium Resolution Spectral Imager - 3 NRSCC (NSMC-CMA, CNSA, CAST) | Current: - Future: FY-3F, FY-3H Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measurement of vegetation indexes and ocean colour. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MERSI-LL Medium Resolution Spectral Imager - Low-Light NRSCC (NSMC-CMA, CNSA, CAST) | Current: FY-3E Future: FY-3I Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measurement of vegetation indexes and ocean colour. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MERSI-S Improved Medium Resolution Spectral Imager - Simplified NRSCC (NSMC-CMA, CNSA, CAST) | Current: - Future: FY-3RM-1, FY-3RM-2 Complete: - | Proposed | Imaging multi-spectral radiometers (vis/IR) | Measurement of vegetation indexes and ocean colour. | Waveband: MERSI-S is a simplified sensor, derived from MERSI but with fewer channels. Spatial resolution: Swath width: Accuracy: |
| MEImage Multi Spectral Imager EUMETSAT (DLR) | Current: - Future: METOP-SG A1, METOP-SG A2, METOP-SG A3 Complete: - | Being developed | Imaging multi-spectral radiometers (vis/IR) | Operational multi spectral imager for meteorological EPS-SG VIS/IR Imaging Mission (VI); imagery data for global and regional NWP, NWC, and climate monitoring | Waveband: 20 channels from VIS to TIR (0.44 to 13.5 µm) Spatial resolution: Sampling distance 500 m at SSP Swath width: 2560 km (+/-53°) Accuracy: |
| MGF MaGnetic Field instrument CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Magnetic field | The MGF consists of dual, tri-axial fluxgate magnetometers mounted on an 80-cm carbon fibre boom for measurements of magnetic field perturbations to a precision of 0.0625 nanotesla, from which to infer small-scale field-aligned currents. The MGF is turned on an average of 20% of the time, following a schedule devised by the science team. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: 0.0625 nanotesla |
| MHS Microwave Humidity Sounder EUMETSAT | Current: NOAA-19, Metop-B, Metop-C Future: - Complete: Metop-A, NOAA-18 | Operational | Atmospheric temperature and humidity sounders | Atmospheric humidity profiles, cloud cover, cloud liquid, water content, ice boundaries and precipitation data. MHS on NOAA-18 is considered failed following an anomaly on 21 October 2018. | 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% |
| Microcarb CNES (UKSA) | Current: - Future: MicroCarb Complete: - | Being developed | Atmospheric chemistry | Measurement of CO2 concentration using CO2 absorption bands at 1607nm and 2046nm | Waveband: B1 (O2): 763.5 nm BW: 10.5nm; B2 (CO2): 1608 nm BW: 22.2nm; B3 (CO2): 2037 nm BW: 28.1 nm; B4(O2): 1273.4 nm BW: 17.6 nm Spatial resolution: 3 FOV size 4,5 km (ACT) x 8.9 km (ALT) simultaneously acquired Swath width: 13km with 3 contiguous pixels of 4.5x8.9km, up to > 25km in Glint mode Accuracy: CO2 concentrations: bias < 0.1 ppm (objective), < 0.2 ppm (threshold) , random< 0.5 ppm (objective), 1.5 ppm (threshold) (values extracted from the mission specification) |
| MicroDragon SMI & TPI VAST | Current: MicroDragon Future: - Complete: - | Operational | Ocean colour instruments | Designed to observe ocean color for assessing coastal water quality and locate living resources | Waveband: Multispectral Spatial resolution: 90m Swath width: 60 x 45 km Accuracy: |
| MIRAS (SMOS) Microwave Imaging Radiometer using Aperture Synthesis (MIRAS) ESA | Current: SMOS Future: - Complete: - | Operational | Imaging multi-spectral radiometers (passive microwave) | 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: Hexagonal 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 |
| MIRIS Multi-purpose IR Imaging System SI (KASI) | Current: STSAT-3 Future: - Complete: - | Operational | Space environment | Mapping of the Galactic plane and measurement of large angular fluctuations of cosmic near infrared background radiation. Not an EO payload. | Waveband: 0.9 - 2.0µm, 3 - 5µm Spatial resolution: Swath width: Accuracy: |
| MIRS Middle IR Scanner NSAU | Current: Sich 2-30 Future: - Complete: 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 | Current: Terra Future: - Complete: - | 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 | Current: Aura Future: - Complete: - | 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% |
| MODIS MODerate-Resolution Imaging Spectroradiometer NASA | Current: Terra, Aqua Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | 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) | Current: Terra Future: - Complete: - | Operational | Atmospheric chemistry | Measurements of CO in the troposphere, running 24/7, 365d of the year. | 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% |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|--|-------------|--|--|---|
| MSC Multi-Spectral Camera KARI (E-LOP) | Current: KOMPSAT-2 Future: - Complete: - | 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; VIS-NIR: 4 m Swath width: 15 km Accuracy: |
| MSG Comms Communications package for MSG EUMETSAT | Current: Meteosat-9, Meteosat-10, Meteosat-11, Meteosat-8 Future: - Complete: - | Operational | Communications | Communication package onboard MSG series satellites. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MSI (BJ-2) Multispectral Imager UKSA (NRSCC, 21AT) | Current: DMC3, SSTL S1-4 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | SSTL-300 S1 Imager also known as VHRI 100 (Very High Resolution Imager 100). | Waveband: 600-670 nm (red) 510-590 nm (green) 440-510 nm (blue) 760-910 nm (NIR) Spatial resolution: 4 metre ground sampling distance Swath width: 23.4 km Accuracy: |
| MSI (EarthCARE) Multi-Spectral Imager (EarthCARE) ESA | Current: - Future: EarthCARE Complete: - | 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 swath with, asymmetrically; 35 km to 115 km versus nadir point Accuracy: |
| MSI (Sentinel-2) Multi-Spectral Instrument (Sentinel-2) ESA (COM) | Current: Sentinel-2 A, Sentinel-2 B Future: Sentinel-2 C, Sentinel-2 D Complete: - | Operational | 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 Multispectral imaging system ROSKOSMOS | Current: Kanopus-V N3, Kanopus-V N4, Kanopus-V N5, Kanopus-V N6 Future: - Complete: BelKA, Kanopus-V N1, Kanopus-V-IR N2 | Operational | High resolution optical imagers | Multispectral images of land & sea surfaces and ice cover. | Waveband: 0.46 - 0.51 µm; 0.51 - 0.6 µm; 0.63 - 0.69 µm; 0.75 - 0.84 µm Spatial resolution: 12 m Swath width: 20 km Accuracy: 10 |
| MSU-GS Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS) | Current: Elektro-L N2, Elektro-L N3 Future: Elektro-L N4, Elektro-L N5 Complete: Elektro-L N1 | 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: 0.5 - 0.65 µm; 0.65 - 0.8 µm; 0.8-0.9 µm; 3.5 - 4.1 µm; 5.7 - 7.0 µm; 7.5-8.5 µm; 8.5-9.2 µm; 9.2-10.2 µm; 10.2 - 11.2 µm, 11.2 - 12.5 µm Spatial resolution: 1000 m; 4000 m Swath width: Full Earth disk Accuracy: |
| MSU-GS/VE Multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS) | Current: Arctica-M N1 Future: Arctica-M N2 Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Operational metrology, hydrology, climate monitoring and environmental monitoring | Waveband: 0.5 - 0.65 µm; 0.65 - 0.8 µm; 0.8-0.9 µm; 3.5 - 4.01 µm; 5.7 - 7.0 µm; 7.5-8.5 µm; 8.2-9.2 µm; 9.2-10.2 µm; 10.2 - 11.2 µm, 11.2 - 12.5 µm Spatial resolution: 1000 m; 4000 m Swath width: Full Earth disk Accuracy: |
| MSU-IK-SR Multi-channel medium and far IR range radiometer ROSKOSMOS | Current: Kanopus-V-IR N2 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection. | Waveband: 3.5-4.1 µm; 8.4-9.4 µm Spatial resolution: 200 m Swath width: 2000 km Accuracy: |
| MSU-MR Low-resolution multispectral scanning imager-radiometer ROSHYDROMET (ROSKOSMOS) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-3M, Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | Operational | Imaging multi-spectral radiometers (vis/IR) | Parameters of clouds, snow, ice and land cover, vegetation, surface temperature, fire detection. | Waveband: 0.5 - 0.7 µm; 0.7 - 1.1 µm; 1.6 - 1.8 µm; 3.5 - 4.1 µm; 10.5 - 11.5 µm, 11.5 - 12.5 µm Spatial resolution: 1000 m Swath width: 2900 km Accuracy: |
| MTVZA-GY Scanning microwave imager-sounder ROSHYDROMET (ROSKOSMOS) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-3M, Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | Operational | Imaging multi-spectral radiometers (passive microwave) | Atmospheric temperature and humidity profiles, precipitation, sea-level wind speed, snow/ice coverage. | Waveband: 18.7 - 183.3 GHz, 26 channels Spatial resolution: 10000 - 100000 m Swath width: 1500 km Accuracy: |
| MTVZA-GY-MP Advanced Scanning microwave imager-sounder ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | 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 |
| Multi-Angle Multi-Spectral Camera CAST | Current: Goumang Future: - Complete: - | Operational | High resolution optical imagers | Detect and measure vegetation biomass, atmospheric aerosol and chlorophyll fluorescence, and can also obtain the remote-sensing information of global forest carbon sinks. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Multiview Thermal-Infrared ESA | Current: - Future: Harmony Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Observations of motion occurring at or near Earth's surface. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MUX (CBERS-4) Multispectral CCD Camera INPE (CAST) | Current: CBERS-4 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Agriculture; Forestry; Geology; Natural disaster management; Cartography; Environment monitoring; Fire detection, localization and counting; Hydrology, coastal water mapping; Land use; Surveillance and law enforcement | 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 (CBERS-4A) Multispectral CCD Camera INPE (CAST) | Current: CBERS-4A Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Agriculture; Forestry; Geology; Natural disaster management; Cartography; Environment monitoring; Fire detection, localization and counting; Hydrology, coastal water mapping; Land use; Surveillance and law enforcement | Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 16 m Swath width: 90 km Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|--|--|---|
| MUX (GF-1) Multispectral CCD Camera CRESDA | Current: GF-1 Future: - Complete: - | 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: 70km Accuracy: |
| MUX (GF-2) Multispectral CCD Camera CRESDA | Current: GF-2 Future: - Complete: - | 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: 45km Accuracy: |
| MUX (ZY-3-01) Multispectral CCD Camera CRESDA | Current: ZY-3-01 Future: - Complete: - | 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: |
| MUX (ZY-3-02) Multispectral CCD Camera CRESDA | Current: ZY-3-03, ZY-3-02 Future: - Complete: - | 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: 50 km Accuracy: |
| MVIRS Moderate Resolution Visible and Infrared Imaging Spectroradiometer NRSCC (CNSA, CAST) | Current: - Future: FY-3F, FY-3H, FY-3I Complete: - | 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: |
| MWHS-2 Improved MicroWave Humidity Sounder CAST (NSMC-CMA, CNSA) | Current: FY-3D, FY-3E Future: FY-3F, FY-3H, FY-3I, FY-3C Complete: - | Operational | Atmospheric temperature and humidity sounders | Meteorological applications. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MWIM Microwave Imager EUMETSAT (ESA) | Current: - Future: METOP-SG B1, METOP-SG B2, METOP-SG B3 Complete: - | Being developed | Imaging multi-spectral radiometers (passive microwave) | Measure cloud liquid water, ice cloud content, precipitation, total column water vapour, snow parameters, sea ice parameters | Waveband: Microwave: 18 channels between 18.7 GHz to 183 GHz Spatial resolution: Footprint size 10-50km Swath width: 1700km Accuracy: |
| MWIR Microwave Instrument NASA | Current: GRACE-FO Future: - Complete: - | 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 equivalent water |
| MWIR (GF-4) Medium Wavelength Infrared Camera CRESDA | Current: GF-4 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Infrared measurements for environmental and natural disaster monitoring. | Waveband: 3.5 - 4.1 µm Spatial resolution: 400m Swath width: 400km Accuracy: |
| MWR (AWS) Arctic Weather Satellite Microwave Radiometer ESA | Current: - Future: AWS Complete: - | Being developed | Atmospheric temperature and humidity sounders | Cross-track scanning microwave radiometer. Provides measurements of atmospheric humidity and temperature. | Waveband: Spatial resolution: Swath width: Accuracy: |
| MWRI Micro-Wave Radiation Imager NRSCC (NSMC-CMA, CNSA, CAST) | Current: FY-3D Future: FY-3F, FY-3RM-1, FY-3RM-2 Complete: FY-3A, FY-3B, FY-3C | 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) | Current: - Future: METOP-SG A1, METOP-SG A2, METOP-SG A3 Complete: - | Being developed | Atmospheric temperature and humidity sounders | All-weather night-day temperature sounding | Waveband: 25 channels from 23.8 to 229 GHz Spatial resolution: Footprint size 17 - 40 km Swath width: 1700km Accuracy: |
| MWTS-2 Micro-Wave Temperature Sounder-2 NRSCC (CNSA, CAST) | Current: FY-3D, FY-3E Future: FY-3F, FY-3H, FY-3I, FY-3C Complete: - | Operational | Atmospheric temperature and humidity sounders | Atmospheric sounding measurements. | Waveband: Microwave: 19.35 - 89.0 GHz (8 channels) Spatial resolution: 32 km at ssp. Swath width: Cross-track: 30 steps of 32 km s.s.p., swath 2250 km Accuracy: |
| MX (Cartosat-3) Multispectral VNIR ISRO | Current: CARTOSAT-3 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | High resolution land observation and cartography | Waveband: VNIR Multispectral Spatial resolution: 1 m Swath width: 16 km Accuracy: |
| NAOMI (MS) New Astrosat Optical Modular Imager (MS) GISTDA | Current: - Future: THEOS-2 Main VHR Satellite Complete: - | Being developed | High resolution optical imagers | NAOMI - MS (2m GSD, 10.3km Swath) is a TMA opto-mechanical instrument employing 24-stage TDI scanning. Data is used for various applications including cartography, land use planning and management, national security, etc. | Waveband: MS (B:0.45-0.53 µm, G:0.53-0.60 µm, R:0.63-0.70 µm, NIR:0.76-0.87 µm) Spatial resolution: 2.0m Swath width: 10.3km Accuracy: Geolocation Accuracy: 25m (1m with GCP) |
| NAOMI (PAN) New Astrosat Optical Modular Imager (PAN) GISTDA | Current: - Future: THEOS-2 Main VHR Satellite Complete: - | Being developed | High resolution optical imagers | NAOMI - PAN (0.5m GSD, 10.3km Swath) is a TMA opto-mechanical instrument employing a line scanning technique. Data is used for various applications including cartography, land use planning and management, national security, etc. | Waveband: PAN: 0.45-0.74 µm Spatial resolution: 0.5m Swath width: 10.3km Accuracy: Geolocation Accuracy: 25m (1m with GCP) |
| NigeriaSat 2 Remote Sensing (Med and High Res) NASRDA | Current: NigeriaSat-2 Future: - Complete: - | 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 X Remote Sensing (Medium Resolution) NASRDA | Current: NigeriaSat-X Future: - Complete: - | 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 |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|--|-----------------|---|---|--|
| NIR-SWIR Multi-spectral Optical Camera - Near & Short Wave Infrared CONAE, AEB | Current: - Future: SAC-E/SABIA_MAR-1, SAC-E/SABIA_MAR-2 Complete: - | Approved | Ocean colour instruments | Ocean Colour - Open ocean, coastal & in-land waters. Atmospheric corrections | Waveband: Near & Short Wave Infrared, 6 bands: 750 - 765 - 865 -1044 - 1240 - 1610 nm Spatial resolution: 400m Swath width: 1495 km Accuracy: |
| NISTAR NIST Advanced Radiometer NASA (NOAA) | Current: DSCOVR Future: - Complete: - | Operational | 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 |
| NMS Neutral Mass Spectrometer JAXA (CSA) | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | The Neutral Mass and velocity Spectrometer (NMS) measures mass composition and velocity of neutral atmospheric species in the 1-40 amu mass and 0.1-2 km/s velocity range. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: |
| NOAA Comms Communications package for NOAA NOAA | Current: NOAA-19 Future: - Complete: NOAA-12, NOAA-14, NOAA-15, NOAA-9, NOAA-10, NOAA-11, NOAA-13, NOAA-16, NOAA-17, NOAA-18 | Operational | Communications | | Waveband: Spatial resolution: Swath width: Accuracy: |
| NRD Navigation Radar Detector Test Mission NDRE (NOSA) | Current: NORSAT-3 Future: - Complete: - | Operational | Other | Navigation Radar Detector, detecting and identifying maritime navigation radars. | Waveband: Spatial resolution: Swath width: Accuracy: |
| OCI Ocean Color Instrument NASA | Current: - Future: PACE Complete: - | Being developed | Ocean colour instruments | Ocean colour slit-grating imaging spectrometer/radiometer for measuring top of atmosphere reflectance which is used to estimate ocean leaving light that contains information on biological components. | Waveband: UV-NIR (350 - 800 nm); SWIR (940, 1240, 1378, 1615, 2130 and 2260 nm) Spatial resolution: 1 km Swath width: 2500 km swath Accuracy: 5nm spectral resolution |
| OCM (Oceansat-2) Ocean Colour Monitor (Oceansat-2) ISRO | Current: 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: 1400 km Accuracy: |
| OCM (Oceansat-3) Ocean Colour Monitor (Oceansat-3) ISRO | Current: - Future: OCEANSAT-3, OCEANSAT-3A Complete: - | Proposed | Ocean colour instruments | Ocean colour data, Estimation of phytoplankton concentration, identification of potential fishing zones, assessment of primary productivity. | Waveband: 13 channel Spatial resolution: 360m Swath width: 1400 km Accuracy: |
| OEK VR Multispectral optoelectronic high resolution module ROSKOSMOS | Current: - Future: Resurs-PM N1, Resurs-PM N2, Resurs-PM N3 Complete: - | Approved | High resolution optical imagers | Multispectral images of land surfaces and Oceans. | Waveband: 1 panchromatic band (0.5 - 0.8 µm), 8 multispectral bands (0.40 - 0.45 µm, 0.45 - 0.51 µm, 0.51 - 0.58 µm, 0.58 - 0.62 µm, 0.63 - 0.69 µm, 0.70 - 0.74 µm, 0.77 - 0.89 µm, 0.86 - 1.05 µm). Spatial resolution: panchromatic band - 0.4 m multispectral bands - 1.6 m Swath width: 19 km Accuracy: |
| OLCI Ocean and Land Colour Imager ESA (COM) | Current: Sentinel-3 A, Sentinel-3 B Future: Sentinel-3 C, Sentinel-3 D Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | 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 USGS (NASA) | Current: Landsat 8 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures surface radiance, land cover state, and change (e.g., 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 32 m; relative geodetic accuracy of 18 m (excluding terrain effects); geometric accuracy of 12 m or better |
| OLI-2 Operational Land Imager 2 USGS (NASA) | Current: Landsat 9 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures surface radiance, land cover state, and change (e.g., 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 32 m; relative geodetic accuracy of 18 m (excluding terrain effects); geometric accuracy of 12 m or better |
| OLS Operational Linescan System NOAA (DoD (USA)) | Current: DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18 | 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 (FMI, NASA) | Current: Aura Future: - Complete: - | Operational | Atmospheric chemistry | Mapping of ozone columns, key air quality components (NO ₂ , SO ₂ , 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 | Current: JPSS-1, JPSS-2 Future: JPSS-3, JPSS-4, Suomi NPP Complete: - | 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 |
| OMPS-L Ozone Mapping and Profiler Suite Limb Profiler NASA (NOAA) | Current: Suomi NPP Complete: - | Operational | Atmospheric chemistry | Measures high resolution vertical distribution of ozone and aerosols. | Waveband: 280 - 1020 nm Spatial resolution: 1 km vertical Swath width: 3 vertical slits along track +/- 250 km Accuracy: Relative accuracy: the larger of 10% or 20 ppb in ozone from tropopause to 60 km, 20% aerosol extinction from tropopause to 35 km. |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-----------------|---------------------------------|---|--|
| OPS (Pan, Multi) Wide-swath and high-resolution optical imager (Pan, Multi) JAXA | Current: - Future: ALOS-3 Complete: - | Being developed | High resolution optical imagers | Disaster monitoring, map generation, land monitoring, agricultural monitoring, natural resource exploration, forest monitoring. | Waveband: Pan: 520-760 nm Multi: Band 1: 400-450 nm (Coastal) Band 2: 450-500 (Blue) Band 3: 520-600 (Green) Band 4: 610-690 (Red) Band 5: 690-740 (RedEdge) Band 6: 760-890 (NIR) Spatial resolution: Pan: 0.8 m, Multi: 3.2 m at nadir Swath width: 70 km at nadir Accuracy: |
| Optical Instrument (CO3D) CNES | Current: - Future: CO3D Complete: - | Being developed | High resolution optical imagers | Will provide global Digital Surface Models of landmasses between +70° latitudes with a resolution of 1 m and in 3D. | Waveband: Red, green, blue and VNIR bands with 50 cm GSD Spatial resolution: 50cm Swath width: Accuracy: The objective is to get a 1 m relative altimetric accuracy (CE90) at 1 m ground sampling distance (GSD). Each DSM will be produced at 1, 4, 12, 15 and 30 meter GSD. At 15 m and 30m GSD, the DSM will be delivered as open data. |
| OSIRIS Optical Spectrograph and Infra-Red Imaging System CSA (SNSA) | Current: Odin Future: - Complete: - | 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 |
| P-Band SAR P-Band Synthetic Aperture Radar ESA | Current: - Future: BIOMASS Complete: - | Being developed | Imaging microwave radars | Forest biomass monitoring | Waveband: P-band: 435 MHz; four polarization channels - HH, HV, VH, and VV - together with height measurements from polarimetric interferometry; incidence angles ranging from 23 to 31 degrees 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) |
| PALSAR-2 Phased Array type L-band Synthetic Aperture Radar-2 JAXA | Current: ALOS-2 Future: - Complete: - | Operational | 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 |
| PALSAR-3 Phased Array type L-band Synthetic Aperture Radar-3 JAXA | Current: - Future: ALOS-4 Complete: - | 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: 35km, Stripmap mode: 100-200 km, Scan SAR mode: 700 km, Polarimetry: 100-200 km Accuracy: |
| PAN (BJ-2) Panchromatic Imager UKSA (NRSCC, 21AT) | Current: DMC3, SSTL S1-4 Future: - Complete: - | Operational | High resolution optical imagers | SSTL-300 S1 Imager also known as VHRI 100 (Very High Resolution Imager 100). | Waveband: 450-650 nm Spatial resolution: 1 metre ground sampling distance Swath width: 23.4 km Accuracy: |
| PAN (Cartosat-2A/2B) Panchromatic Camera ISRO | Current: CARTOSAT-2B, CARTOSAT-2A Future: - Complete: - | 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-2E) Panchromatic Camera ISRO | Current: CARTOSAT-2E, CARTOSAT-2C Future: - Complete: - | 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: 0.65 m Swath width: 10 km Accuracy: |
| PAN (Cartosat-3) Panchromatic sensor ISRO | Current: CARTOSAT-3 Future: - Complete: - | Operational | 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: 0.25 m Swath width: 16 km Accuracy: |
| PAN (CBERS-4) Panchromatic and Multispectral Imager CAST (INPE) | Current: CBERS-4 Future: - Complete: - | Operational | High resolution optical imagers | Agriculture; Forestry; Geology; Natural disaster management; Cartography; Environment monitoring; Fire detection, localization and counting; Hydrology, coastal water mapping; Land use; Surveillance and law enforcement | 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 (GF-1) Panchromatic and multispectral imager CRESDA | Current: GF-1 Future: - Complete: - | Operational | 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: 70km Accuracy: |
| PAN (GF-2) Panchromatic and multispectral imager CRESDA | Current: GF-2 Future: - Complete: - | Operational | 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: 45km Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-------------|--|---|--|
| PAN (ZY Series) Panchromatic and multispectral imager CRESDA | Current: ZY-1-02D, ZY-1-02E Future: - Complete: ZY-1-02C | 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: 60 km Accuracy: |
| PAN CAMERA Panchromatic Camera ASI | Current: PRISMA Future: - Complete: - | Operational | High resolution optical imagers | Panchromatic data. | Waveband: VIS: 400 - 700 nm Spatial resolution: 5 m Swath width: 30 km Accuracy: - |
| Passive Synthetic Aperture Radar ESA | Current: - Future: Harmony Complete: - | Operational | Imaging microwave radars | High-resolution observations of motion occurring at or near Earth's surface. Record radio waves originating from the accompanying Copernicus Sentinel-1 satellite as they bounce back from the Earth's surface, allowing scientists to measure small shifts in the shape of the land surface, such as those related to earthquakes and volcanic activity, as well as of land ice and sea ice. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Paz SAR-X X Band Synthetic Aperture Radar CDTI (HISDESAT) | Current: PAZ Future: - Complete: - | Operational | 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: 50 cm to 8.5 m (1s) depending of the product selected. |
| PHA Pulse Height Analyzer NOAA (NASA) | Current: DSCOVR Future: - Complete: - | Operational | Space environment | | Waveband: Spatial resolution: Swath width: Accuracy: |
| PHyTIR Prototype HypsIRI Thermal Infrared Radiometer (PHyTIR) NASA | Current: ECOSTRESS-on-SS Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | This project will use a high-resolution thermal infrared radiometer to measure plant evapotranspiration, the loss of water from growing leaves and evaporation from the soil. | Waveband: TIR: 8-12.5 µm Spatial resolution: 60 m Swath width: 360km Accuracy: |
| PlasMag Plasma-Magnetometer NOAA (NASA) | Current: DSCOVR Future: - Complete: - | Operational | Space environment | Magnetometer and plasma sensor to measure solar wind properties for forecasting geomagnetic storms. The Plasma-mag instrument comprises a Faraday Cup (measures solar wind) and a Fluxgate Magnetometer, as well as two space weather instruments: the Electron Spectrometer and the Pulse Height Analyzer. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Polarisation Imager CAST | Current: Goumang Future: - Complete: - | Operational | Other | Detect and measure vegetation biomass, atmospheric aerosol and chlorophyll fluorescence, and can also obtain the remote-sensing information of global forest carbon sinks. | Waveband: Spatial resolution: Swath width: Accuracy: |
| POSEIDON-3B Altimeter Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) CNES | Current: Jason-3 Future: - Complete: - | 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 |
| POSEIDON-3C Altimeter Positioning Ocean Solid Earth Ice Dynamics Orbiting Navigator (Single frequency solid state radar altimeter) NASA | Current: - Future: SWOT Complete: - | Approved | 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 |
| Poseidon-4 Altimeter Poseidon-4 SAR Radar Altimeter CNES (ESA) | Current: Sentinel-6 A Michael Freilich Future: Sentinel-6 B Complete: - | 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: On baseline TOPEX/POSEIDON orbit (10 day cycle); 300 km between tracks at equator. Accuracy: Sea level: 3.2 cm, Significant wave height: 0.15 m, Horizontal sea surface wind speed: 1.5 m/s |
| PR Precipitation Radar NSMC-CMA | Current: - Future: FY-3RM-1, FY-3RM-2 Complete: - | Proposed | Cloud profile and rain radars | Precipitation radar. | Waveband: Spatial resolution: Swath width: Accuracy: |
| PSS Panchromatic imaging system ROSKOSMOS | Current: Kanopus-V N3, Kanopus-V N4, Kanopus-V N5, Kanopus-V N6 Future: - Complete: BelKA, Kanopus-V N1, Kanopus-V-IR N2 | Operational | High resolution optical imagers | Panchromatic data for environmental monitoring, agriculture and forestry. | Waveband: 0.54 - 0.86 µm Spatial resolution: 2.1 m Swath width: 23 km Accuracy: 10 |
| RAD Microwave radiometer NSOAS | Current: HY-2B, HY-2C, HY-2D Future: HY-2E, HY-2F, HY-2G, HY-2H, HY-2A Complete: - | Operational | Imaging multi-spectral radiometers (passive microwave) | Ocean wind and temperature measurements. | Waveband: 6.6 GHz, 10.7 GHz, 18.7 GHz, 23.8 GHz, 37.0 GHz Spatial resolution: 100 km, 62 km, 36 km, 30 km, 18 km Swath width: 1600 km Accuracy: 1 K |
| RASAT VIS Multispectral RASAT VIS Multispectral camera TUBITAK | Current: RASAT Future: - Complete: - | 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 | Current: RASAT Future: - Complete: - | 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: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|--|---|
| RF Beacon Radio Frequency Beacon NOAA (UCAR) | Current: COSMIC-2 FM1, COSMIC-2 FM2, COSMIC-2 FM3, COSMIC-2 FM4, COSMIC-2 FM5, COSMIC-2 FM6 Future: - Complete: - | Operational | Space environment | Transmitter that enables ground-based measurement of ionospheric scintillation and ionospheric total electron content (TEC). Critical to understanding the impacts of space weather on satellite communication systems and GPS. | Waveband: Spatial resolution: Swath width: Accuracy: |
| RO EUMETSAT (ESA) | Current: - Future: METOP-SG A1, METOP-SG B1, METOP-SG A2, METOP-SG A3, METOP-SG B2, METOP-SG B3 Complete: - | Being developed | Atmospheric temperature and humidity sounders | GNSS receiver for atmospheric temperature and humidity profile sounding. | Waveband: L-Band 1575.42, 1176.45, 1176.45 MHz Spatial resolution: <1.5 km Swath width: Altitude range of 0 - 30 km Accuracy: Temperature sounding better 1 K ms |
| ROSA Radio Occultation Sounder for the Atmosphere ASI (ISRO) | Current: OCEANSAT-2 Future: - Complete: - | Operational | Atmospheric temperature and humidity sounders | 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 | Current: Diademe 1&2 Future: - Complete: - | Operational | Precision orbit | Satellite laser ranging for geodynamic measurements. | Waveband: Spatial resolution: Swath width: Accuracy: |
| RRI Radio Receiver Instrument CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | The RRI measures wave electric fields in the 10Hz - 18MHz range, at magnitudes from 1 μ V/m to 1 V/m to study the morphology and dynamics of ionospheric density structures, auroral wave-particle interactions, plasma nonlinear processes created by intense high frequency waves, and the mechanism of coherent wave backscatter. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: |
| RSI Remote Sensing Imager NSPO | Current: Formosat-5 Future: - Complete: - | Operational | | | Waveband: 1 Pan, 4 MS (Multispectral) bands: Blue, Green, Red, NI Spatial resolution: 2 m (Pan), 4 m (MS) Swath width: 24 km Accuracy: |
| S-band SAR UKSA (CSIRO) | Current: NovaSAR-1 Future: - Complete: - | Operational | Imaging microwave radars | SAR imagery for a range of applications including agriculture, maritime and forestry | Waveband: S-band: 3.1-3.3 GHz Spatial resolution: ScanSAR: 20 m; Stripmap: 6m; ScanSAR Wide: 30 - 50m; Maritime 6x13.7 m Swath width: ScanSAR: 50 - 100 km; Stripmap: 13-20 km; ScanSAR Wide: 55 - 195 km; Maritime: 400 km Accuracy: sub 50 m |
| S-band SAR (NISAR) S-band Synthetic Aperture Radar (SAR) (NISAR) ISRO | Current: - Future: NISAR Complete: - | Approved | 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: Microwave: 3.2 GHz Spatial resolution: 4 - 24m resolution Swath width: 230 km min Accuracy: TBD |
| S&R (GOES) Search and Rescue NOAA | Current: GOES-14, GOES-15, EWS-G1 Future: - Complete: - | 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 | Current: NOAA-19, Metop-B Future: CDARS Complete: Metop-A, NOAA-8, NOAA-14, NOAA-15, NOAA-9, NOAA-10, NOAA-11, NOAA-13, NOAA-16, NOAA-17, NOAA-18 | Operational | Communications | 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 | Current: SAGE-III-on-ISS Future: - Complete: - | Operational | Atmospheric chemistry | Limb-viewing measurements of aerosol, O ₃ , H ₂ O, NO ₂ , OClO, NO ₃ , 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%, H ₂ O: 10 - 15%; NO ₂ : 10-15%; NO ₃ : 10%; O ₃ : 5%; OClO: 25%; Pressure: 2%; Temperature Profile; 2K |
| SAR (CAS500-5) KARI | Current: - Future: CAS500-5 Complete: - | Being developed | Imaging microwave radars | High resolution radar for water resource monitoring | Waveband: C-Band Spatial resolution: Swath width: Accuracy: |
| SAR (KOMPSAT-6) KARI | Current: - Future: KOMPSAT-6 Complete: - | Being developed | Imaging microwave radars | High resolution radar for land applications of cartography and disaster monitoring | Waveband: X-Band Spatial resolution: Swath width: Accuracy: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|--|-----------------|--------------------------|--|--|
| SAR (RADARSAT-2) Synthetic Aperture Radar (SAR) C band CSA | Current: RADARSAT-2 Future: - Complete: - | 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: Spotlight: 5 - 2 x 0.8 m (1 look); Ultra-Fine: 5 - 2 x 3 m (1 look); Wide Ultra-Fine: 3 - 2 x 3 m (1 look); Multi-Look Fine/Wide MLF: 11 - 7 x 8 m (4 looks); Extra-Fine: 8 - 4 x 5 m (1 look) to 24 - 12 x 24 m (28 looks); Fine: 10 - 7 x 8 m (1 look); Wide Fine: 15 - 7 x 8 m (1 look); Standard: 27 - 17 x 25 m (4 looks); Wide: 40 - 19 x 25 m (4 looks); Extended (H/L): 18 - 16 x 25 m / 53 - 23 x 25 m (4 looks); Fine Quad-Pol: 17 - 7 x 8 m (1 look); Wide Fine Quad-Pol: 17 - 8 x 8 m (1 look); Standard Quad-Pol: 29 - 18 x 8 m (1 look); Wide Standard Quad-Pol: 30 - 17 x 8 m (1 look); ScanSAR (NW): 81 - 38 x 40 - 70 m / 163 - 73 x 78 - 106 m (4/8 looks); Ship Detection: 33 - 23 x 19 - 77 m (5 looks); Ocean Surveillance: 80 - 36 x 27 - 99 m (4 looks). Swath width: Spotlight: 18 km [8 km along-track]; Ultra-Fine: 20 km; Wide Ultra-Fine: 50 km; Multi-Look Fine/Wide MLF: 50/90 km; Extra-Fine: 125 km; Fine: 50 km; Wide Fine: 150 km; Standard: 100 km; Wide: 150 km; Extended (H/L): 75/170 km; Fine Quad-Pol: 25 km; Wide Fine Quad-Pol: 50 km; Standard Quad-Pol: 25 km; Wide Standard Quad-Pol: 50 km; ScanSAR (NW): 300/500 km; Ship Detection: 450 km; Ocean Surveillance: 500 km. Accuracy: Relative Radiometric Accuracy (within a 100 km scene): <1 dB |
| SAR (RCM) Synthetic Aperture Radar (SAR) C band CSA (NRCAN, DND, DFO, AAFC, ECCO, PSC) | Current: RCM-1, RCM-2, RCM-3 Future: - Complete: - | Operational | 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 and Low Noise: 100 x 100 m (8 looks); Medium Resolution 50 m: 50 x 50 m (4 looks); Medium Resolution 30 m: 30 x 30 m (4 looks); Medium Resolution 16 m: 16 x 16 m (4 looks); High-Resolution 5 m: 5 x 5 m (1 look); Very High Resolution 3 m: 3 x 3 m @35deg (1 look); Spotlight: 1 x 3 m @35deg (1 look); Quad-Pol: 9 x 9 m (1 look). Swath width: Low Resolution 100 m: 500 km; Medium Resolution 50 m: 350 km; Low Noise: 350 km; Ship Detection: 350 km; Medium Resolution 30 m: 125 km; Medium Resolution 16 m: 30 km; High-Resolution 5 m: 30 km; Very High Resolution 3 m: 20 km; Spotlight: 20 km [5 km along-track]; Quad-Pol: 20 km. Accuracy: Absolute Radiometric Accuracy: +/- 1.0 dB |
| SAR (RISAT) Synthetic Aperture Radiometer (RISAT) ISRO | Current: RISAT-1A Future: RISAT-1B Complete: RISAT-1 | 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 (MoD (Italy)) | Current: COSMO-SkyMed 4, COSMO-SkyMed 1, COSMO-SkyMed 2 | 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-L L-Band Synthetic Aperture Radar CONAE | Current: SAOCOM 1A, SAOCOM 1B Future: SAOCOM-2B, SAOCOM-2A Complete: - | Operational | 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: Absolute radiometric accuracy: 0.5 dB (QP), 1.0 dB (SP, DP); Polarimetric accuracy: 0.3 dB; Phase accuracy between polarimetric channels: 15°; Geolocation accuracy: on-line: 90 m, off-line: 25 m (with precise orbit). |
| SAR-X Synthetic Aperture Radiometer (RISAT-2) ISRO | Current: RISAT-2 Future: - Complete: - | 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: |
| SBG TIR Instrument Thermal Infrared (TIR) Instrument NASA (ASI) | Current: - Future: SBG-TIR Complete: - | Being developed | Hyperspectral imagers | Hyperspectral imager to provide information on terrestrial and aquatic ecosystems, hydrology, weather, climate, and solid Earth. | Waveband: TIR bands (8 bands up to ~12 µm) Spatial resolution: TBD Swath width: TBD Accuracy: TBD |
| SBG VSWIR Instrument Visible and Short-Wave Infrared (VSWIR) Instrument NASA | Current: - Future: SBG-VSWIR Complete: - | Being developed | Hyperspectral imagers | Hyperspectral imager to provide information on terrestrial and aquatic ecosystems, hydrology, weather, climate, and solid Earth. | Waveband: VIS and SWIR bands (0.4 - 2.5 µm) Spatial resolution: TBD Swath width: TBD Accuracy: TBD |
| SBUV/2 Solar Backscatter Ultra-Violet Instrument/2 NOAA | Current: NOAA-19 Future: - Complete: NOAA-14, NOAA-9, NOAA-10, NOAA-11, NOAA-13, NOAA-16, NOAA-17, NOAA-18 | 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 (ESA) | Current: - Future: METOP-SG B1, METOP-SG B2, METOP-SG B3 Complete: - | Being developed | Scatterometers | Measures wind speed and direction over ocean, soil moisture, sea ice cover, sea ice type, snow cover and snow parameters and vegetation parameters | Waveband: Microwave: C Band, 5.355 GHz Spatial resolution: 25 km Swath width: 2 x 660 km swath width Accuracy: Wind speeds in range 4 - 24 m/s |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-----------------|---|---|---|
| Scanning Spectrometer (GeoCarb) NASA | Current: - Future: GeoCarb Complete: - | Being developed | Atmospheric chemistry | GeoCarb Mission employs a 4-channel slit imaging spectrometer that measures reflected IR sunlight at wavelengths 1.61µm and 2.06µm for XCO ₂ , and 2.32µm for XCH ₄ and XCO. The fourth channel, 0.76µm, measures O ₂ column concentration and SIF, and it also provides valuable information on aerosol and cloud contamination. The North/South (N/S) extent of the scan is fixed at a 4.4° field of view, which maps to 25° latitude or 2800 km at the Sub-Satellite Point (SSP). There are 1016 N/S samples with 4.1 km spatial resolution, spaced 2.7 km apart on center. The measurements are acquired in an East to West (E/W), 0.3825s step, and 4.08s stare (integration) mode, with 3 km sampling EW steps and 5.4 km resolution at SSP. | Waveband: 0.76 µm, 1.61 µm, 2.06 µm, 2.32µm Spatial resolution: 3 km by 4.1 km at nadir Swath width: From 55 degrees N to 55 degrees S Accuracy: 0.2% or 0.8ppm (whichever is greater) for XCO ₂ as measured against time integrated TCCON observations at multiple sites, 0.6% or 10.0 ppb (whichever is greater) for XCH ₄ as measured against time integrated TCCON observations at multiple sites, 10% or 10.0 ppb (whichever is greater) for XCO as measured against time integrated TCCON observations at multiple sites. Retrieve estimates of solar induced fluorescence (SIF) from spectral measurements of the Fraunhofer lines near 758 nm and 770 nm with a NESR that is better than 0.5 mW/(m ² sr nm). |
| SCAT Scatterometer NSOAS | Current: HY-2B, HY-2C, HY-2D Future: HY-2E, HY-2F, HY-2G, HY-2H, HY-2A Complete: - | Operational | Scatterometers | Monitoring global sea surface winds. | Waveband: 13.2515 GHz, HH, VV Spatial resolution: 50 km Swath width: 1300 km Accuracy: 0.5 dB |
| SCAT Wind SCAterometer CNES | Current: CFOSAT Future: - Complete: - | Operational | Scatterometers | Ocean surface wind vector | Waveband: Ku-band Spatial resolution: Swath width: Accuracy: |
| Scatterometer (Oceansat-3) ISRO | Current: - Future: OCEANSAT-3 Complete: - | Being developed | Scatterometers | Ocean surface wind measurements, continuity to ocean vector wind | Waveband: 13.515 GHz Spatial resolution: 25 km Swath width: 1440 km Accuracy: |
| SEI Suprathermal Electron Imager CSA | Current: ePOP on CASSIOPE Future: - Complete: - | Operational | Space environment | The SEI measures the electron energy and pitch angle distribution over the energy range of 1 to 200 eV, with particular emphasis on photoelectrons in the 1 to 50 eV range. The instrument now operates in passive mode as the High Voltage source has failed. | Waveband: N/A Spatial resolution: N/A Swath width: N/A Accuracy: |
| SEISS Space Environment In Situ Suite NOAA | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | 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: 0.25 |
| SEM (GOES) Space Environment Monitor NOAA | Current: GOES-14, GOES-15, EWS-G1 | 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 | Current: NOAA-19, Metop-B, Metop-C Future: - Complete: Metop-A, NOAA-12, NOAA-14, GOES-7, NOAA-9, NOAA-10, NOAA-13, NOAA-16, NOAA-17, NOAA-18 | 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: |
| SEP Space Environment Monitoring Instrument Package NSMC-CMA | Current: FY-4A, FY-4B Future: FY-4C, FY-4D, FY-4E, FY-4F, FY-4G Complete: - | Operational | Space environment | A suite that contains energetic particle detectors, magnetometer, and space weather impact detectors, among which, the energetic particle detectors measure high energy protons (0.4-4MeV) and high energy electrons (1-165MeV, and >165MeV) with two probes. Particle flux detection is performed in multiple directions with a number of probes mounted toward different orientation on the three-axis stabilized spacecraft. The space weather impact detectors measure radiation dosage, electrification at the surface and deep inside the spacecraft. It's the first time China put space weather impact and space environment detectors on the same geostationary platform. | Waveband: Spatial resolution: Swath width: Accuracy: |
| SES Space Environment Suite, improved SEM CAST (NSMC-CMA, CNSA) | Current: FY-3D, FY-3E Future: FY-3F, FY-3C Complete: - | Operational | Space environment | Measures space environment parameters to support space craft operations. | Waveband: Spatial resolution: Swath width: Accuracy: |
| Severyanin-M ROSHYDROMET (ROSKOSMOS) | Current: Meteor-M N2-2 Future: Meteor-M N2-4, Meteor-M N2-5, Meteor-M N2-3, Meteor-M N2-6 Complete: Meteor-M N1, Meteor-M N2-1, Meteor-M N2 | Operational | Imaging microwave radars | Land and sea surface monitoring | Waveband: X-band Spatial resolution: 350-1000 m Swath width: 450 km Accuracy: |
| SEVIRI Spinning Enhanced Visible and Infra-Red Imager EUMETSAT (ESA) | Current: Meteosat-9, Meteosat-10, Meteosat-11, Meteosat-8 Future: - Complete: - | 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 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/m ² |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|---|--|---|
| SGLI Second-generation Global Imager JAXA | Current: GCOM-C Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Medium resolution multi-spectral imaging of land, ocean and atmosphere. SGLI-VNR is an optical sensor capable of multi-channel nadir observation at wavelengths from near-UV to NIR and forward or backward polarization observation at red and near infrared wavelengths (Push-broom scanning). SGLI-IIRS is an optical sensor capable of multi-channel nadir observation at wavelengths from SWIR to TIR wavelengths (Cross-track scanning). | Waveband: VIS - NIR: 0.38 - 0.865 μ m; SW: 1.05 - 2.21 μ m; TIR: 10.8 - 12.0 μ m Spatial resolution: SGLI-VNR: 250 m, 1000 m; SGLI-IIRS: 250 m, 500 m, 1000 m Swath width: SGLI-VNR: 1150 km; SGLI-IIRS: 1400km Accuracy: |
| SGR-ReSI-Z Space GNSS Receiver - Remote Sensing Instrument - Z UKSA (ESA) | Current: DoT-1 Future: - Complete: - | Operational | Other | Ocean winds, waves, soil moisture, flooding, ice, snow | Waveband: L-Band (1575 MHz & 1176 MHz) Spatial resolution: 20-50 km for diffuse scattering, higher resolution for coherent reflections Swath width: Tracks sampled up to approx 700 km apart, wider possible with different antenna Accuracy: Approx 2 m/s wind speed accuracy (lower winds), target 10% for higher winds |
| SIM-2 Solar Irradiance Monitor-2 NRSCC (NSMC-CMA, CNSA, CAST) | Current: FY-3E Future: FY-3H, FY-3I, FY-3C Complete: - | Operational | Earth radiation budget radiometers | Solar irradiance monitoring. | Waveband: 0.2 - 50 μ m Spatial resolution: Swath width: Accuracy: |
| SIRAL SAR Interferometer Radar Altimeter ESA | Current: 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 |
| SLSTR Sea and Land Surface Temperature Radiometer ESA (COM) | Current: Sentinel-3 A, Sentinel-3 B Future: Sentinel-3 C, Sentinel-3 D Complete: - | Operational | 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. |
| SmallCat SmallCat Test Mission NSO (NOSA) | Current: - Future: NORSAT-TD Complete: - | Being developed | Communications | Demonstrate a robust optical laser communications with an experimental CubeSat terminal | Waveband: Spatial resolution: Swath width: Accuracy: |
| SMR Submillimetre Radiometer SNSA | Current: Odin Future: - Complete: - | Operational | Atmospheric chemistry | Measures global distributions of ozone and species of importance for ozone chemistry ClO, HNO ₃ , H ₂ O, N ₂ O, (HO ₂ , H ₂ O ₂). 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 |
| Sounder NOAA | Current: GOES-14, GOES-15, EWS-G1 | 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: |
| Sounder (INSAT) IR Sounder ISRO | Current: INSAT-3DR Future: INSAT-3DS, INSAT-3D Complete: - | Operational | Atmospheric temperature and humidity sounders | Atmospheric soundings, atmospheric stability, thermal gradient winds. | Waveband: SWIR: 3.74 - 4.74 μ m; MWIR: 6.51 - 11.03 μ m; TIR: 12.02 - 14.71 μ m; VIS: 0.55 - 0.75 μ m Spatial resolution: 10 x 10 km Swath width: Full (Full Earth disc sounding), Program (Options provided for for Sector Scans) Accuracy: |
| SpaceStar Fugro Space Star Test Mission NOSA | Current: - Future: NORSAT-TD Complete: - | Being developed | Precision orbit | Verify sub-decimeter augmented GPS positioning in real-time with CubeSat receiver | Waveband: Spatial resolution: Swath width: Accuracy: |
| Spectrometer (OCO-2) NASA | Current: OCO-2 Future: - Complete: - | Operational | Atmospheric chemistry | Global measurements of atmospheric CO ₂ needed to describe the variability of CO ₂ sources and sinks. | Waveband: 0.76 μ m, 1.61 μ m, 2.06 μ m Spatial resolution: 2.25 km downtrack, variable cross-track Swath width: Varies from 0.1 km at the sub-solar latitude to 10.6 km at terminators Accuracy: Provide the data needed to yield single sounding estimates of XCO ₂ with one sigma errors of <= 2 ppm |
| Spectrometer (OCO-3) NASA | Current: OCO-3-on-ISS Future: - Complete: - | Operational | Atmospheric chemistry | Global measurements of atmospheric CO ₂ needed to describe the variability of CO ₂ sources and sinks. | Waveband: 0.765 μ m, 1.61 μ m, 2.06 μ m Spatial resolution: 2.25 km downtrack by 0.7 km cross-track Swath width: Soundings = 4.5 km ² in area during Nadir Observation Accuracy: provide single sounding estimates of XCO ₂ with one sigma errors of <= 2 ppm |
| Spectrometer (TEMPO) NASA | Current: - Future: TEMPO Complete: - | Being developed | Atmospheric chemistry | Hourly measurements of air pollution over North America, from Mexico City to the Canadian oil sands, at high spatial resolution. Measurements in ultraviolet and visible wavelengths will provide a suite of products including the key elements of tropospheric air pollution chemistry. Will be part of the first global geostationary constellation for pollution monitoring, along with European and Korean missions now in development. | Waveband: 290 to 750 nm (TBC) Spatial resolution: 2.22 km by 5.15 km at at geodetic location 36.5° N, 100° W Swath width: From 18 degrees N to 58 degrees N Accuracy: Precisions include tropospheric O ₃ to 10 ppbv in 1 hour, tropospheric NO ₂ to 1e15 molecules cm ⁻² in 1 hour, and tropospheric H ₂ O to 1e16 molecules cm ⁻² in 3 hours, all geo-located to an accuracy of 4 km. |
| SPEXone Spectro-Polarimeter for Exploration NSO, SRON (NASA) | Current: - Future: PACE Complete: - | Being developed | Multiple direction/polarisation radiometers | Polarimeter for measuring aerosol optical properties, clouds and aerosol types. Multi-angle spectro-polarimetry by spectral modulation technology. Distribution and detailed micro-physical properties of atmospheric aerosol. Direct and indirect aerosol radiative forcing and their impact on climate. | Waveband: 385 to 770nm at 2nm bands Spatial resolution: 2.5 km Swath width: Narrow swath \pm 4.5°; 100 km; global coverage: 1 month. Accuracy: Polarimetric: 0.003; Radiometric: 0.02 |
| SRAL SAR Radar Altimeter ESA (COM) | Current: Sentinel-3 A, Sentinel-3 B Future: Sentinel-3 C, Sentinel-3 D Complete: - | Operational | 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) |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|--|--|---|
| SSI/ES-2 Special Sensor Ionospheric Plasma Drift/Scintillation Meter NOAA (DoD (USA)) | Current: 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)) | Current: DMSP F-16, DMSP F-17, DMSP F-18 | 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: |
| SSIM Solar Spectral Irradiance Monitor NSMC-CMA | Current: FY-3E Future: FY-3I Complete: - | Operational | Earth radiation budget radiometers | Solar irradiance monitoring. | Waveband: 165-1650nm: split in three bands: 165-320 nm (resolution 1 nm), 285-700 nm (resolution 1 nm) and 650-1650 nm (resolution 8 nm) Spatial resolution: Swath width: Accuracy: 3% from 165 to 240 nm and 2% from 240 to 1650 nm. |
| SSJ/4 Special Sensor Precipitating Plasma Monitor NOAA (DoD (USA)) | Current: 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)) | Current: DMSP F-16 Future: - Complete: - | 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)) | Current: DMSP F-15, DMSP F-16, DMSP F-17, DMSP F-18 | 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)) | Current: 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)) | Current: DMSP F-16, DMSP F-17, DMSP F-18 | 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)) | Current: 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)) | Current: 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: |
| SSTM-1 (Oceansat-3) Sea Surface Temperature Monitor-1 ISRO | Current: - Future: OCEANSAT-3, OCEANSAT-3A Complete: - | Being developed | Imaging multi-spectral radiometers (vis/IR) | TIR and OCM combination will support joint analysis for operational potential fishing zones. | Waveband: 2 bands Spatial resolution: 1080 m Swath width: 1440 km Accuracy: |
| SSULI Special Sensor Ultraviolet Limb Imager NOAA | Current: DMSP F-16, DMSP F-17, DMSP F-18 | 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 | Current: DMSP F-16, DMSP F-17, DMSP F-18 | 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: |
| STIS Supra Thermal Ion Sensor NOAA (NASA) | Current: - Future: SWFO-L1 Complete: - | Proposed | Space environment | | Waveband: Spatial resolution: Swath width: Accuracy: |
| STR Star Tracker Set (3) ESA | Current: Swarm Future: - Complete: - | Operational | 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 | Current: GOES-16, GOES-17, GOES-18 Future: GOES-U Complete: - | Operational | 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 | Current: CFOSAT Future: - Complete: - | Operational | Scatterometers | Ku-band Real-aperture radar (RAR) system, multi-incidence beams(0-10°) and azimuth scanning. Measurement of 2D ocean waves spectrum | Waveband: Ku-band Spatial resolution: 50x50km on 2D spectra Swath width: 140 km Accuracy: accuracy for wave estimates: minimum detectable wavelength of about 70 m, maximum detectable wavelength about 500m, accuracy in wave propagation direction of about 15°, accuracy in wavelength of 10 to 20%, accuracy in significant wave height of 10% or better than 40-50 cm (TBC) |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|---|-----------------|---|--|--|
| SWIPS Solar Wind Plasma Sensor NOAA (NASA) | Current: - Future: SWFO-L1 Complete: - | Proposed | Space environment | | Waveband: Spatial resolution: Swath width: Accuracy: |
| SWS/SEM/HEPD Space Weather Suite / Space Environment Monitor/ High Energy Particle Detector NSMC-CMA | Current: FY-3D, FY-3E Future: FY-3I Complete: - | Operational | Space environment | Energetic particle spectrometer: Spectrometer for electrons (0.25-2.0 MeV), protons (6.4-38 MeV) and alpha-particles (15-60 MeV) | Waveband: Spatial resolution: Swath width: Accuracy: |
| SWS/SEM/IMS Space Weather Suite / Space Environment Monitor / Ionosphere Measurement Sensor NSMC-CMA | Current: FY-3D, FY-3E Future: FY-3I Complete: - | Operational | Space environment | To measure ionospheric electron temperature and density, and platform charge and dose. Specially arranged Langmuir Probe for electron temperature (0-1 eV) and density in the 10 ⁻¹⁰ 10 ⁶ e/cm ³ range | Waveband: Spatial resolution: Swath width: Accuracy: |
| SWS/Tri-IPM Space Weather Suite / Triple-angle Ionospheric PhotoMeter NSMC-CMA | Current: FY-3E Future: FY-3I Complete: - | Operational | Space environment | UV spectrometry of the ionosphere performed under 3 different viewing angles. Observation of the night-sky oxygen airglow intensity for the retrieval of ionospheric total electrons and NmF2 (sensitivity =150 counts.s ⁻¹ .R ⁻¹); and observation of the bright-day oxygen air glow intensity and the nitrogen air glow intensity of LBH (sensitivity=1 counts.s ⁻¹ .R ⁻¹) for the retrieval of oxygen-nitrogen ratio at the ionospheric altitude. Three units which point in different directions | Waveband: Night sky oxygen airglow intensity: 135.6nm, Bright day oxygen airglow intensity: 135.6nm, Night sky nitrogen air glow intensity: 140-180nm Spatial resolution: 30 km at the altitude of 300 km. Swath width: 3.5° (along-track) × 1.6° (cross-track), sampling at 20s intervals Accuracy: |
| SXI Solar X-ray Imager NOAA (USAF) | Current: GOES-14, GOES-15, EWS-G1 | 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-3 Total Anthropogenic and Natural emissions mapping Spectrometer-3 JAXA | Current: - Future: GOSAT-GW Complete: - | Being developed | Atmospheric chemistry | | 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)) | Current: GOSAT Future: - Complete: - | 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: |
| TANSO-CAI-2 Thermal And Near infrared Sensor for carbon Observation - Cloud and Aerosol Imager-2 JAXA (MOE (Japan), NIES (Japan)) | Current: GOSAT-2 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Detection and correction of cloud and aerosol for TANSO-FTS, aerosol characteristics | Waveband: 0.343 µm, 0.443 µm, 0.674 µm, 0.869 µm, 1.63 µm / tilt angle +20deg, 0.380 µm, 0.550 µm, 0.674 µm, 0.869 µm, 1.63 µm / tilt angle -20deg. Spatial resolution: 0.5 km (0.343, 0.443, 0.674, 0.869, 0.380, 0.550, 0.674, 0.869 µm bands), 1.0 km (1.63 µm band) Swath width: 1000 km Accuracy: |
| TANSO-FTS Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer JAXA (MOE (Japan), NIES (Japan)) | Current: GOSAT Future: - Complete: - | Operational | 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: 1000 km Accuracy: |
| TANSO-FTS-2 Thermal And Near infrared Sensor for carbon Observation - Fourier Transform Spectrometer-2 JAXA (MOE (Japan), NIES (Japan)) | Current: GOSAT-2 Future: - Complete: - | Operational | Atmospheric chemistry | CO2, CH4, and CO distribution. | Waveband: 0.754 - 0.772 µm, 1.56 - 1.69 µm, 1.92 - 2.38 µm, 5.55 - 8.41 µm, 8.41 - 14.3 µm Spatial resolution: 9.7km Swath width: 1000 km Accuracy: |
| TGF Detectors NYUAD (UAE SA, Khalifa University) | Current: Light-1 Future: - Complete: - | Operational | Lightning sensors | Dedicated mission optimized for TGF observations focusing on short time scales and energy ranges not well studied by other missions. | Waveband: Terrestrial Gamma-ray Flashes Spatial resolution: Swath width: Accuracy: |
| TGRS TriG (Tri-GNSS) GNSS Radio-occultation System NOAA, NSPO (UCAR) | Current: COSMIC-2 FM1, COSMIC-2 FM2, COSMIC-2 FM3, COSMIC-2 FM4, COSMIC-2 FM5, COSMIC-2 FM6 Future: - Complete: - | Operational | Atmospheric temperature and humidity sounders | TGRS is the radio occultation receiver, which will receive signals from GPS, Galileo, and Glonass. | Waveband: Spatial resolution: Swath width: Accuracy: |
| TGSP Trace Gas Spectrometer ROSHYDROMET | Current: - Future: Meteor-MP N1, Meteor-MP N2, Meteor-MP N3 Complete: - | Proposed | Atmospheric chemistry | Trace gas measurements. | Waveband: Spatial resolution: Swath width: Accuracy: |
| TIRS Thermal Infrared Sensor USGS (NASA) | Current: Landsat 8 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures longwave thermal infrared surface emittance, land cover state, and change. Used as multipurpose imagery for land applications. | Waveband: TIR 10.5 µm and 12 µm Spatial resolution: 100 m Swath width: 185 km Accuracy: Absolute geodetic accuracy of 44 m; geometric accuracy of 32 m or better |
| TIRS (PREFIRE) Thermal Infrared Spectrometer NASA | Current: - Future: PREFIRE Complete: - | Being developed | Hyperspectral imagers | Pushbroom spectroradiometric imagers in highly inclined orbits to provide spectral fluxes, column-water vapor, surface emissivity and broadband radiances over majority of thermal wavelengths. | Waveband: 4 - 53 µm, 0.86 µm sampling Spatial resolution: 10 - 15 km (sampling) Swath width: Nadir Pushbroom, perpendicular to orbit track, 8 scenes with gaps Accuracy: Measurement noise less than 0.33 K for a 300 K unit emissivity scene, in each channel between 6 and 11 microns, and scene measurement noise less than 1.1 K for a 300 K unit emissivity scene, in each channel between 12 and 24 microns |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|--|-----------------|--|---|---|
| TIRS-2 Thermal Infrared Sensor 2 USGS (NASA) | Current: Landsat 9 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Measures longwave thermal infrared surface emittance, land cover state, and change. Used as multipurpose imagery for land applications. TIRS-2 will adhere to the Landsat 8 TIRS instrument performance specifications but will be built to NASA Class-B instrument standards (including a 5-year design life). | Waveband: TIR 10.5 µm and 12 µm Spatial resolution: 100 m Swath width: 185 km Accuracy: Absolute geodetic accuracy of 44 m; geometric accuracy of 32 m or better |
| TIS (ESP-MACCS) Thermal infrared spectrometer ESA (UKSA) | Current: - Future: ESP-MACCS Complete: - | Proposed | | | Waveband: Spatial resolution: Swath width: Accuracy: |
| TOP (MS) THEOS Optical Payload (MS) GISTDA | Current: THEOS Future: - Complete: - | Operational | High resolution optical imagers | THEOS Optical Payload - MS (15m GSD, 90km Swath) is a refractive instrument employing a line scanning technique. Data is used for various applications including cartography, land use planning and management, national security, etc. | Waveband: MS (B:0.45-0.52 µm, G:0.53-0.60 µm, R:0.63-0.70 µm, NIR:0.77-0.90µm) Spatial resolution: 15m Swath width: 90km Accuracy: Geolocation Accuracy: 133m @ 1s |
| TOP (PAN) THEOS Optical Payload (PAN) GISTDA | Current: THEOS Future: - Complete: - | Operational | High resolution optical imagers | THEOS Optical Payload - PAN (2m GSD, 22km Swath) is a cassegrain type opto-mechanical instrument employing a line scanning technique. Data is used for various applications including cartography, land use planning and management, national security, etc. | Waveband: PAN: 0.45-0.90 µm Spatial resolution: 2.0m Swath width: 22km Accuracy: Geolocation Accuracy: 133m @ 1s |
| TOU/SBUS Total Ozone Unit & Solar Backscatter Ultraviolet Sounder NRSCC (NSMC-CMA, CNSA, CAST) | Current: 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 |
| TROPICS Microwave Spectrometer (TROPICS) NASA (NOAA) | Current: TROPICS Pathfinder Future: TROPICS Complete: - | Operational | Imaging multi-spectral radiometers (passive microwave) | Constellation to provide temperature/moisture sounding and cloud/precipitation imaging with rapid update. | Waveband: Microwave: 90 to 206 GHz Spatial resolution: Moisture: 25 km average across the swath; Temperature: 40 km average across the swath Swath width: 2000 km Accuracy: 1 K |
| TSIS-1/SIM Total Solar and Spectral Irradiance Sensor 1 - Spectral Irradiance Monitor NASA (NOAA) | Current: TSIS-1-on-ISS Future: - Complete: - | Operational | Earth radiation budget radiometers | Measures solar spectral irradiance in the 0.2 - 2 µm range. | Waveband: UV - SWIR: 0.2 - 2 µm Spatial resolution: Swath width: Looks at the sun every orbit, providing 15 measurements per day. Accuracy: Estimated uncertainties between 200-460nm = 0.42%, between 460-2400nm = 0.24%. |
| TSIS-1/TIM Total Solar and Spectral Irradiance Sensor 1 - Total Irradiance Monitor NASA (NOAA) | Current: TSIS-1-on-ISS Future: - Complete: - | Operational | Earth radiation budget radiometers | Measurement of total solar irradiance directly traceable to SI units with an absolute accuracy of 0.035% and relative accuracy of 0.002% per year. | Waveband: Total spectra Spatial resolution: Swath width: Looks at the sun every orbit, providing 15 measurements per day. Accuracy: Estimated uncertainties ~160 ppm. |
| TSIS-2/SIM Total Solar and Spectral Irradiance Sensor 2 - Spectral Irradiance Monitor NASA | Current: - Future: TSIS-2 Complete: - | Being developed | Earth radiation budget radiometers | Measures spectral solar irradiance over three bands ranging from 200 to 2400 nm. | Waveband: Three bands: 200 - 280 nm, 280 - 400 nm, and 400 - 2400 nm. Spatial resolution: 2-45 nm Swath width: Accuracy: 1% between 200 and 400 nm, 0.5% >400 nm |
| TSIS-2/TIM Total Solar and Spectral Irradiance Sensor 2 - Total Irradiance Monitor NASA | Current: - Future: TSIS-2 Complete: - | Being developed | Earth radiation budget radiometers | Measures total solar irradiance over the full spectrum. | Waveband: Total solar spectrum Spatial resolution: Swath width: Accuracy: 200 ppm |
| UVN UV-VIS-NIR Sounder EUMETSAT (ESA) | Current: - Future: MTG-S1 (sounding), MTG-S2 (sounding) Complete: - | 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 (COM) | Current: - Future: Sentinel-4 A, Sentinel-4 B Complete: - | 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) TROPOMI ESA (COM, NSO) | Current: Sentinel-5 precursor Future: - Complete: - | Operational | 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 (EUMETSAT, COM) | Current: - Future: METOP-SG A1, Sentinel-5 A, Sentinel-5 B, METOP-SG A2, METOP-SG A3, Sentinel-5 C Complete: - | Being developed | Atmospheric chemistry | Supporting atmospheric composition and air quality monitoring services. Measurements of atmospheric trace gases, primarily O3, NO2, SO2, HCHO, CH4 and CO. | Waveband: UV-1: 270 - 310 nm, UV-2-VIS: 300 - 500 nm, NIR: 710 nm & 755 - 773 nm, SWIR-1: 1590 - 1675 nm, SWIR-3: 2305 - 2385 nm Spatial resolution: 7.5 km at SSP for wavelengths > 300 nm, 45 km for wavelengths < 300 nm Swath width: Daily global coverage Accuracy: TBD |
| VDES VHF Data Exchange System Test Mission NOSA | Current: NORSAT-2 Complete: - | Operational | Communications | VHF data exchange system enabling bidirectional communications at higher data rates than AIS. | Waveband: Spatial resolution: Swath width: Accuracy: |
| VFM Vector Field Magnetometer ESA | Current: Swarm Future: - Complete: - | Operational | Magnetic field | Magnetic field vector measurements. | Waveband: N/A Spatial resolution: <0.1nT Swath width: N/A Accuracy: <0.5 nT/15 days |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|---|--|-----------------|---|--|--|
| VIIRS Visible/Infrared Imager Radiometer Suite NOAA (NASA) | Current: JPSS-1, JPSS-2 Future: JPSS-3, JPSS-4, Suomi NPP Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | 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, CNSA, CAST) | Current: 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 |
| VIS-NIR Multi-spectral Optical Camera - Visible & Near Infrared CONAE, AEB | Current: - Future: SAC-E/SABIA_MAR-1, SAC-E/SABIA_MAR-2 Complete: - | Approved | Ocean colour instruments | Ocean Colour - Open ocean, coastal & in-land waters. | Waveband: Visible & Near Infrared, 11 bands: 412 - 443 - 490 - 510 - 555 - 620 - 665 - 680 - 710 - 750 - 865 nm Spatial resolution: 200m - 800 m Swath width: 1495 km Accuracy: |
| VNIR (GF-4) Visible and Near-Infrared Camera CRESDA | Current: GF-4 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Infrared measurements for environmental and natural disaster monitoring. | Waveband: 0.45 - 0.90µm, 0.45 - 0.52 µm, 0.52 -0.60 µm, 0.63-0.69 µm, 0.76-0.90 µm Spatial resolution: 50m Swath width: 400km Accuracy: |
| VNIR Camera (SBG-TIR) Visible and Near-Infrared (VNIR) Camera (SBG-TIR) ASI (NASA) | Current: - Future: SBG-TIR Complete: - | Being developed | Imaging multi-spectral radiometers (vis/IR) | Observations will be used for geolocation and to produce retrieved estimates of the Normalized Difference Vegetation Index (NDVI). | Waveband: Operates at the 0.665 micron and 0.835 micron wavelengths. Spatial resolution: Swath width: Accuracy: |
| VNIR Hyperspectral Solar Disk Imager (ESP-MACCS) Visible Near-Infrared Hyperspectral Solar Disk Imager ESA (UKSA) | Current: - Future: ESP-MACCS Complete: - | Proposed | | | Waveband: Spatial resolution: Swath width: Accuracy: |
| VNREDSat-1 MS VNREDSat-1 Multispectral VAST (ASTRIUM) | Current: VNREDSat-1 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | The VNREDSat 1 multispectral instrument is designed for land cover measurements and applications. | Waveband: There are 4 bands of multispectral, visible and infrared and panchromatic Spatial resolution: MS bands: 10m; panchromatic 2.5m Swath width: 17.5 km Accuracy: |
| VSC Venus Superspectral Camera CNES (ISA) | Current: VENuS Future: - Complete: - | Operational | 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: |
| WAI Wide-field Auroral Imager NSMC-CMA | Current: FY-3D Future: - Complete: - | Operational | Space environment | The aurora intensity and form reflect the geomagnetic activity, dynamic feature of high-energy particles in the polar region, and coupling of solar wind with ionosphere. | Waveband: 115-180nm, 427.8-630nm Spatial resolution: 10km/300km Swath width: Accuracy: |
| WFI (Amazonia-1) Wide Field Imager (Amazonia-1) INPE | Current: AMAZONIA-1 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Used for fire extent detection measurement, coastal and vegetation monitoring, land cover and land use mapping. WFI (Amazonia-1) is the same instrument as WFI (CBERS), however due to differences in orbital altitude, they have different spatial resolution | 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: 60 m Swath width: 740 km Accuracy: |
| WFI (CBERS-4) Wide Field Imager (CBERS) INPE (CAST) | Current: CBERS-4 Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Earth resources, environmental monitoring, land use. WFI (Amazonia-1) is the same instrument as WFI (CBERS), however due to differences in orbital altitude, they have different spatial resolutions. | 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: |
| WFI (CBERS-4A) Wide Field Imager INPE (CAST) | Current: CBERS-4A Future: - Complete: - | Operational | Imaging multi-spectral radiometers (vis/IR) | Agriculture; Forestry; Geology; Natural disaster management; Cartography; Environment monitoring; Fire detection, localization and counting; Hydrology, coastal water mapping; Land use; Surveillance and law enforcement | Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm Spatial resolution: 55 m Swath width: 690 km Accuracy: |
| WFOV Wide Field View CRESDA | Current: GF-1 Future: - Complete: - | 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: 16 m Nadir Swath width: 800 km Accuracy: |
| WindRAD Wind Radar NSMC-CMA (CNSA) | Current: FY-3E Future: FY-3H, FY-3I Complete: - | Operational | Scatterometers | Measures sea-surface wind. | Waveband: C and Ku band. Spatial resolution: Swath width: Accuracy: |
| WindSat NASA | Current: - Future: - Complete: CORIOLIS | Operational | Multiple direction/polarisation radiometers | Demonstration of sea surface wind vector observation by polarimetric passive radiometry | Waveband: Spatial resolution: Changing with frequency, consistent with antenna diameters of 1.83 m Swath width: Conical: 50-55° zenith angle, swath 1000 km - Scan rate: 31.6 scan/min = 12.5 km/scan Accuracy: |
| WPM Wide Swath Panchromatic and Multispectral Camera CAST (INPE) | Current: CBERS-4A Future: - Complete: - | Operational | High resolution optical imagers | Agriculture; Forestry; Geology; Natural disaster management; Cartography; Environment monitoring; Fire detection, localization and counting; Hydrology, coastal water mapping; Land use; Surveillance and law enforcement | Waveband: 0.45 - 0.52 µm, 0.52 - 0.59 µm, 0.63 - 0.69 µm, 0.77 - 0.89 µm, 0.45 - 0.90 µm Spatial resolution: 8 m multispectral, 2 m panchromatic Swath width: 90 km Accuracy: |
| WSAR NSOAS (CAST) | Current: - Future: HY-3A, HY-3B, HY-3C, HY-3D Complete: - | 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: |

| Instrument & agency (& any partners) | Missions | Status | Type | Measurements & applications | Technical characteristics |
|--|---|-------------|---------------------------------|--|---|
| WW110 WorldView-110 Camera Maxar | Current: WorldView-3 Future: - Complete: - | Operational | | WorldView-3 has bands for enhanced multispectral analysis (coastal blue, yellow, red edge, NIR2) designed to improve segmentation and classification of land and aquatic features. | Waveband: Panchromatic: 450-800nm, Multispectral: 400-450nm (coastal blue), 450-510nm (blue), 510-580nm (green), 585-625nm (yellow), 630-690nm (red), 705-745nm (red edge), 770-895nm (NIR1), 860-1040nm (NIR2) Spatial resolution: Panchromatic: 0.31m, VNIR: 1.24m, SWIR: 3.7m, CAVIS: 30m Swath width: 13.1km Accuracy: |
| WVC-2 Wide View CCD camera - 2 CAST | Current: HJ-2A, HJ-2B Future: - Complete: - | Operational | High resolution optical imagers | Multispectral measurements of Earth's surface for natural environment and disaster applications. | Waveband: 0.43 - 0.90 μ m (4 bands) Spatial resolution: 30 m Swath width: 360 km (per set), 720 km (two sets) Accuracy: |
| X-Band SAR X-Band Synthetic Aperture Radar DLR | Current: TerraSAR-X, TanDEM-X Future: - Complete: - | 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: |