Earth Science Mission Profile 1997 - 2004

Click the mission name below for a detailed description.

OrbView-2
8/1/97
705 km
98.2˚
12:00 PKM
- SeaWiFS

TRMM
11/27/97
402 km
35˚
- CERES
- LIS
- VIRS
- TMI
- PR (Japan)

Landsat 7
4/15/99
705 km
98.2˚
10:05 AM
- ETM+

QuikSCAT
6/19/99
803 km
98.6˚
6 AM, 6 PM
- SeaWinds

Terra
12/18/99
705 km
98.1˚
10:30 AM
- CERES (2)
- MISR
- MODIS
- ASTER (Japan)
- MOPPIT (Canada)

QuikTOMS
9/21/01
800 km
97.3˚
10:30 AM
- TOMS

Jason-1
12/7/01
1336 km
66˚
- JMR
- TRSR
- LRA
- Poseidon 2
- DORIS (France)

METEOR 3M
12/10/01
1020 km
99.5˚
9:30 AM
- SAGE III

ESSP/GRACE
3/17/02
460 km
89˚
- GPS
- HAIRS
- USO
- SCA (Denmark)
- SSA (France)

Aqua (PM)
5/4/02
705 km
98.2˚
1:30 PM
- AIRS
- AMSU-A
- CERES (2)
- MODIS
- HSB (Brazil)
- AMSR-E (Japan)

ADEOS II
12/13/02
803 km
98.6˚
10:15 AM
- SeaWinds
- AMSR
- GLI
- ILAS-2 (Japan)
- POLDER (Japan)

ICESat
1/12/03
600 km
94˚
- GLAS
- GPS

SORCE
1/25/03
640 km
40˚
- TIM
- SIM
- SOLSTICE
- XPS

Aura
7/15/04
705 km
98.2˚
1:45 PM
- MLS
- TES
- HIRDLS
- OMI (Netherlands/Finland)

PARASOL
12/04
705 km
98.0˚
1:30 PM
- POLDER (France)
- TES
- HIRDLS (UK/US)
- OMI (Netherlands/Finland)

PARASOL fully exited the A-Train and ceased operation on Dec. 18, 2013.

Spacecraft not provided by NASA
Non NASA A-Train constellation member

Items in italics not funded by NASA.

OrbView-2 is not provided or operated by NASA but is a data buy.

Antenna ceased rotating in November 2009: still providing useful data through cross-calibration with other satellites.
**Earth Science Mission Profile 2021 - 2023**

**Click the mission name below for a detailed description.**

<table>
<thead>
<tr>
<th>Mission</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>JPSS-2 2021</strong></td>
<td>833 km 98.7˚ 1:30 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A-DCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• ATMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RBI (NASA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• CrIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OMPS-Nadir</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OMPS-Limb (NASA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SARSAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SEM-N</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• VIIRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SWOT 2021</strong></td>
<td>857-890 km 78˚</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ka-band radar interferometer (NASA/CNES/CSA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Nadir altimeter (CNES)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Microwave radiometer (NASA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• POD (GPS, DORIS, LRA (NASA/CNES)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GeoCARB 2021</strong></td>
<td>35786 km</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ocean color spectrometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Polarimeter (TBD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TROPICS (EVI-3) 2021</strong></td>
<td>600 km 30˚</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Constellation of 12 identical 3U CubeSats, each with a 12-channel passive microwave spectrometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MAIA (EVI-3) 2022</strong></td>
<td>TBD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Multi-spectral/angle polarimeter</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NI-SAR (U.S./India) 2022</strong></td>
<td>747 km 98˚</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• L-band synthetic aperture radar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• S-band synthetic aperture radar (India)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PACE 2022</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Ocean color spectrometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Polarimeter (TBD)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pre-formulation Decadal Survey Missions**

<table>
<thead>
<tr>
<th>Mission</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLARREO</strong></td>
<td>609 km 90˚</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Infrared and/or Reflected Solar spectrometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• GNSS-RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ACE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Spectrometer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Polarimeter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• LIDAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cloud Radar</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HyspIRI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hyperspectral and TIR imagers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GEO-CAPE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• UV-Vis-NIR</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• IR imagers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ASCENDS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Laser</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Items in italics not funded by NASA.**

Future mission launch dates indicate agency baseline commitment (ABC) schedule confidence levels.

**Click for a detailed description.**

**NASA**

**Revised:**

- December 19, 2016

**Spacecraft not provided by NASA**

**Other agency spacecraft of interest**

**Currently in Operation**

**Future Mission**

**Launch Failure**

**No Longer in Science Operation**
ACRIMSAT
- ACRIM3 - Active Cavity Radiometer Irradiance Monitor

ADEOS II (Midori II)
- AMSR - Advanced Microwave Scanning Radiometer
- GLI - Global Imager
- ILAS-2 - Improved Limb Atmospheric Spectrometer 2
- POLDER - Polarization and Directionality of the Earth’s Reflectances

Aqua
- AIRS - Atmospheric Infrared Sounder
- AMSU-A - Advanced Microwave Sounding Unit-A
- CERES - Clouds and the Earth’s Radiant Energy System
- MODIS - Moderate Resolution Imaging Spectroradiometer
- HSB - Humidity Sounder for Brazil
- AMSR-E - Advanced Microwave Scanning Radiometer for EOS

Aura
- HIRDLS - High Resolution Dynamics Limb Sounder
- MLS - Microwave Limb Sounder
- OMI - Ozone Monitoring Instrument
- TES - Tropospheric Emission Spectrometer

ESSP/GRACE
Earth System Science Pathfinder/Gravity Recovery And Climate Experiment
- GPS - Black-Jack Global Positioning System Receiver
- HAIRS - High-Accuracy Inter-satellite Ranging System
- SCA - Star Camera Assembly
- SSA - SuperStar Accelerometer
- USO - Ultra Stable Oscillator

ICESat
- GLAS - Geoscience Laser Altimeter System
- GPS - Global Positioning System

Jason-1
- JMR - Jason Microwave Radiometer
- TRSR - Turbo Rogue Space Receiver
- LRA - Laser Retroreflector Array
- DORIS - Doppler Orbitography and Radiopositioning Integrated by Satellite
- Poseidon-2 Altimeter

Landsat 7
- ETM+ - Enhanced Thematic Mapper Plus

METEOR 3M/SAGE III
- SAGE III - Stratospheric Aerosol and Gas Experiment III

NMP/EO-1
New Millennium Program/Earth Observing-1
- ALI - Advanced Land Imager
- Hyperion - Hyperspectral Instrument
- LAC - Linear Etalon Imaging Spectral Array (LEISA) Atmospheric Corrector

OrbView-2
- SeaWIFS - Sea-viewing Wide Field-of-view Sensor

PARASOL
Polarization & Anisotropy of Reflectances for Atmospheric Sciences coupled with Observations for a Lidar
- POLDER - Polarization and Directionality of the Earth’s Reflectance

QuikScat
Quick Scatterometer
- SeaWinds

QuikTOMS
- TOMS - Total Ozone Mapping Spectrometer

SORCE
Solar Radiation and Climate Experiment
- TIM - Total Irradiance Monitor
- SIM - Spectral Irradiance Monitor
- SOLSTICE - Solar Stellar Irradiance Comparison Experiment
- XPS - XUV Photometer System

Terra
- ASTER - Advanced Spaceborne Thermal Emission and Reflection Radiometer
- CERES - Clouds and the Earth’s Radiant Energy System
- MISR - Multi-angle Imaging Spectroradiometer
- MODIS - Moderate Resolution Imaging Spectroradiometer
- MOPITT - Measurements of Pollution in the Troposphere
TRMM
*Tropical Rainfall Measuring Mission*

- CERES - Clouds and the Earth’s Radiant Energy System
- LIS - Lightning Imaging Sensor
- VIRS - Visible and Infrared Scanner
- TMI - TRMM Microwave Imager
- PR - Precipitation Radar
**Mission Profile 2005 - 2015**

### CATS
*Cloud-Aerosol Transport System*
- LIDAR

### DSCOVR
*Deep Space Climate Observatory*
- PlasMag - Plasma-Magnetometer
- NISTAR - National Institute of Standards and Technology Advanced Radiometer
- EPIC - Earth Polychromatic Imaging Camera

### ESSP/Aquarius
- LBR - L-Band Radiometer
- LBS - L-Band Scatterometer

### ESSP/CALIPSO
*Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations*
- CALIOP - Cloud Aerosol Lidar with Orthogonal Polarization
- IIR - Imaging Infrared Radiometer
- WFC - Wide Field Camera

### ESSP/CloudSat
- CPR - Cloud Profiling Radar

### ESSP/OCO-2 (also ESSP/OCO)
*Orbiting Carbon Observatory*
- Three high-resolution grating spectrometers

### GCOM-W1
*The Global Change Observation Mission-Water*
- AMSR2 - Advanced Microwave Scanning Radiometer

### Glory
- APS - Aerosol Polarimetry Sensor
- CC - Cloud Camera
- TIM - Total Irradiance Monitor

### GPM Core Observatory
*Global Precipitation Measurement*
- DPR - Dual Frequency Precipitation Radar
- GMI - GPM Microwave Imager

### LDCM Landsat Data Continuity Mission (Landsat 8)
- OLI - Operational Land Imager
- TIRS - Thermal Infrared Sensor

### OSTM/Jason-2
*Ocean Surface Topography Mission/Jason-2*
- DORIS - Doppler Orbitography and Radio-positioning Integrated by Satellite
- TRSR - Turbo Rogue Space Receiver
- LRA - Laser Retroreflector Array
- Poseidon-3 Altimeter
- AMR - Advanced Microwave Radiometer
- GPSP - Global Positioning System Payload

### Rapid-SCAT (International Space Station)
- Rapid Scatterometer

### Suomi NPP
*Suomi National Polar-orbiting Partnership*
- ATMS - Advanced Technology Microwave Sounder
- CERES - Clouds and the Earth's Radiant Energy System
- CrIS - Cross-Track Infrared Sounder
- OMPS-Nadir - Ozone Mapping and Profiler Suite
- VIIRS - Visible/Infrared Imager/Radiometer Suite

### SMAP
*Soil Moisture Active Passive*
- L-Band Radiometer
- L-Band Radar
ACE
Aerosols-Clouds-Ecosystems
- Spectrometer
- Polarimeter
- LIDAR
- Cloud Radar

ASCENDS
Active Sensing of CO₂ Emissions over Nights, Days, and Seasons
- Laser

CLARREO Pathfinder
Climate Absolute Radiance & Refractivity Observatory
- Reflected Solar Spectrometer
- GNSS-RO - Global Navigation Satellite Systems - Radio Occultation System

CYGNSS (EVM-1)
Cyclone Global Navigation Satellite System (Earth Venture-2)
- 8 micro-satellites using GPS signals to measure ocean surface wind speeds

ECOSTRESS
ECOsystem Spaceborne Thermal Radiometer Experiment on Space Station
- Infrared radiometer

EVI-4
Earth Venture Instrument

EVM-2
Earth Venture Full Orbital Mission

GEDI
Global Ecosystem Dynamics Investigation
- Lidar

GEO-CAPE
- Ultraviolet-visible-near-infrared
- Infrared imagers

GeoCARB
Geostationary Carbon Cycle Observatory
- scanning IR slit spectrometer

GOES-R
Geostationary Operational Environmental Satellite-R Series
- ABI - Advanced Baseline Imager
- EXIS - Extreme Ultraviolet and X-Ray Irradiance Sensor
- GLM - Geostationary Lightning Mapper
- MAG - Magnetometer
- SEISS - Space Environment In Situ Suite
- SUVI - Solar Ultraviolet Imager

GRACE-FO
Gravity Recovery And Climate Experiment-Follow-on
- ACC - Accelerometer
- MWI - Microwave Instrument
- LRI - Laser Ranging Interferometer

HyspIRI
- Hyperspectral and thermal infrared imagers

ICESat-2
- ATLAS - Advanced Topographic Laser Altimeter System
- GPS - Global Positioning System

Jason-3
- DORIS - Doppler Orbitography and Radio-positioning Integrated by Satellite
- TRSR - Turbo Rogue Space Receiver
- LRA - Laser Retroreflector Array
- Poseidon-3 Altimeter
- AMR-2 - Advanced Microwave Radiometer
- GPS - Global Positioning System Payload
Mission Profile 2016 - 2023 • Acronym List

**JPSS-1**
Joint Polar Satellite System
- ATMS - Advanced Technology Microwave Sounder
- CERES - Clouds and the Earth's Radiant Energy System
- CrIS - Cross-Track Infrared Sounder
- OMPS-Nadir - Ozone Mapping and Profiler Suite
- RBI - Radiation Budget Experiment
- VIIRS - Visible/Infrared Imager/Radiometer Suite

**JPSS-2**
Joint Polar Satellite System

**Landsat 9**
- OLI-2 Operational Land Imager-2
- TIRS-2 Thermal Infrared Sensor-2

**LIS**
- LIS - Lightning Imaging Sensor

**MAIA**
Multi-Angle Imager for Aerosols
- Multi-spectral/angle polarimeter

**NI-SAR**
- InSAR - Interferometric Synthetic Aperture RADAR (Radio Detection and Ranging)

**OCO-3**
Orbiting Carbon Observatory
- Three high-resolution grating spectrometers

**PACE (Pre-ACE)**
Pre-Aerosol, Clouds, and ocean Ecosystem
- Ocean color/aerosol spectrometer
- Polarimeter (International partnership TBD)

**Sentinel 6A**
- AMR-C - Climate Quality Microwave Radiometer
- DORIS-NG - Doppler Orbitography and Radio-positioning Integrated by Satellite-NG
- GNSS POD Receiver
- LRA - Laser Retroreflector Array
- Poseidon-4 Altimeter - Poseidon-4 SAR Radar Altimeter
- TriG - TriG Receiver for Radio Occultation

**SAGE-III (International Space Station)**
- Stratospheric Aerosol and Gas Experiment - III

**SWOT**
Surface Water Ocean Topography
- KaRIn - Ka-band radar interferometer
- Nadir Altimeter
- Microwave Radiometer
- POD (GPS, DORIS, LRA)

**TEMPO**
Tropospheric Emissions: Monitoring of Pollution
- UV and Visible Offner Grating Spectrometer

**TROPICS**
Time-Resolved Observations of Precipitation structure and storm Intensity with a Constellation of SmallSats
- 12 identical 3U CubeSats, each with a 12-channel passive microwave spectrometer

**TSIS-1**
Total and Spectral Solar Irradiance Sensor
- Total Irradiance Monitor
- Spectral Irradiance Monitor

**TSIS-2**
Total and Spectral Solar Irradiance Sensor
- Total Irradiance Monitor
- Spectral Irradiance Monitor