

# Upcoming Earth Explorers in Brief

Earth Explorers are research missions designed to address key scientific challenges, while demonstrating breakthrough technology in observing techniques. To date, **ESA has launched five Earth Explorer missions**, each providing an important contribution to further understanding of our planet.

**These four are the next missions to take off:**

## earthcare

### ESA'S CLOUD, AEROSOL AND RADIATION MISSION

**Aim** The largest and most complex Earth Explorer to date, EarthCARE will advance:

- our understanding of the role that clouds and aerosols play in reflecting incident solar radiation back into space
- trapping infrared radiation emitted from Earth's surface

**Innovation** EarthCARE is a joint venture between ESA and JAXA (Japan Aerospace Exploration Agency), and it will employ high-performance lidar and radar technology, which has never been flown in space before

**Curiosity** The largest Earth Explorer to date, at 19 m long with the solar panel deployed



## biomass

### ESA'S FOREST MISSION

**Aim** To provide crucial information about the state of our forests and how they are changing

**Innovation** Its data will be used to further our knowledge of the role forests play in the carbon cycle. Observations from this mission will also lead to:

- better insight into rates of habitat loss, thus the impact this may be having on biodiversity in the forest environment;
- the opportunity to map subsurface geology in deserts and map the topography of forest floors

**Curiosity** Biomass will also provide essential support to UN treaties on the reduction of emissions from deforestation and forest degradation

## flex

### ESA'S PHOTOSYNTHESIS MISSION

**Aim** To provide global maps of vegetation fluorescence that can reflect photosynthetic activity and plant health and stress

**Benefits** Important for a better understanding of the global carbon cycle, but also for agricultural management and food security

**Innovation** Currently not possible to measure photosynthetic activity from space, but FLEX's novel instrument will be capable of achieving this

**Curiosity** FLEX will fly in tandem with the Copernicus Sentinel-3 mission, in particular working in combination with the OLCI and SLSTR instruments Sentinel-3 carries

## forum

### ESA'S THERMAL RADIATION MISSION

**Aim** To measure the radiation emitted by Earth into space, providing insight into the planet's radiation budget and how it is controlled

**Benefits** Will allow to better understand the energy balance of our planet, bringing great benefits to climate science

**Innovation** FORUM will measure across the entire far-infrared part of the electromagnetic spectrum, which has previously never been measured. It will allow more accurate tracking of key atmospheric components such as:

- anthropogenic greenhouse gases;
- water vapour and optically thin ice clouds; thus improving the accuracy of climate models