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