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**

**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**

**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

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

**FLEX**

**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**

**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