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EO4EU: An Integrated and Scalable Platform for Accessing and Processing Earth Observation and Earth Modeling data

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The increase in the volume of Earth Observation (EO) data in the past decade has led to the emergence of cloud-based services in recent years. **Copernicus** data and services have provided several EO and Earth Modeling data to European Citizens. Data acquired from Sentinel satellites is made available to the end users through the Copernicus Data Space Ecosystem, providing free access to a wide range of data and services from the Copernicus Sentinel missions and other land, ocean, and atmosphere EO data. Moreover, there are six Copernicus services providing data for the atmosphere, marine, land, climate change, security, and emergency related services. As these services, which are not directly integrated, require different data access methods, Copernicus Data and Information Access Services (DIAS) are providing centralised access to Copernicus data and information, in addition to cloud infrastructure and processing tools. The Copernicus Data Access Service (C-DAS), builds on DIAS-es existing distribution services, ensuring their continuity, and bringing significant improvements like advanced search functions, virtualisations, APIs etc.

Destination Earth (DestinE) develops a high precision digital model of the Earth (a digital twin) to monitor and simulate natural and human activity, with the first two digital twins focusing on weather-induced and geophysical extremes, and on climate change adaptation. DestinE will deliver enormous new Earth modelling data and access to Copernicus data. Finally, there are several existing European Data Spaces providing data from various domains (agriculture, food security, health, energy, natural resources, environmental monitoring, insurances, tourism, security). This data opens new opportunities for the creation of beyond state-of-the-art solutions which can provide new products and services to the public.

Despite the significant volume and plethora of EO and Earth Modeling data offered, their access has not been yet extended beyond experts and scientists to the wider industry to deliver tangible applications that improve our health and lives and protect the planet. Unfortunately, a small part of the market has that kind of expertise and, as follows, **high value EO information remains unexploited**, it is often fragmented, complex, diverse, difficult to find, retrieve, download and process, while users must have some kind of domain expertise to find, access, understand how to pre-process data, find storage solutions and transform data into useful formats for analytics and Geographic Information Systems (GIS).

The **EO4EU project** is providing an integrated and scalable platform to make the above-mentioned EO data easily findable and accessible, relying on machine learning and advanced user interfaces supported by a highly automated multi-cloud computing platform and a pre-exascale high-performance computing infrastructure. EO4EU introduces an ecosystem for the holistic management of EO data, improving its FAIRness by delivering dynamic data mapping and labelling based on AI, while bridging the gap between domain experts and end users, and while bringing in the foreground technological advances to address the market straightness towards a wider usage of EO data.

In this session, the key innovative features of the EO4EU Platform will be presented, and architectural insights will be provided.

Topic

Needs and solutions in scientific computing: Platforms and gateway

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