**Title:** *Feeding the models with voluminous operational data and make them exploitable by users: the experience from ESA’s Copernicus Sentinels and DestinE platform*

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**Abstract:** *Measurements of the Earth are key for understanding the complexity of our planet and support decrypting the climate-resources-population conundrum. Satellites provide an advantageous viewpoint to observe the Earth and many of its phenomena, particularly the impacts of climate change. Space-based Earth Observation data are used by scientists and analysts from all over the world across many different sectors, with long time series feeding complex system models and supporting various types of reanalysis and forecasts in support to decision making in complex environments. Under the the European Commission’s Destination Earth initiative, tera-byte-scale space-based data from the operational European Programme Copernicus will be integrated within digital models of the Earth to provide alternative what-if scenarios related to e.g. natural disasters, weather hazards, and climate change paths. The complexity of the data flows is exacerbated by the open nature of the platform which aims to serve a broad variety of users and user scenarios. In this context, the European Space Agency acts as provider of Copernicus Sentinels data on the one side and as the developer of the DestinE platform, the front-end of DestinE system, on the other side. In this lecture, we will describe the complexity of the system and the challenges faced in this first development phase. We will also argue for the future scenarios of operation of the system and the related challenges and opportunities.*

**Keywords**: Earth observations (1); climate (2); digital twins (3).

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**Useful links**:

Copernicus Programme: https://copernicus.eu

Destination Earth initiative: <https://destination-earth.eu/>

Copernicus Sentinels Data Access: <https://dataspace.copernicus.eu/>