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Advancing Federated Open Science Infrastructures for FAIR and Responsible Research

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The EU-funded OSTrails project is advancing a federated approach to Open Science by addressing a key challenge: the fragmentation of research data management (RDM) practices across disciplines, tools, and institutions. By building a network of interoperable services for planning, tracking, and assessing research activities, OSTrails promotes reproducible, FAIR-aligned, and responsible science.

With 41 partners and 25 pilots spanning national, thematic, and European infrastructures, OSTrails demonstrates how a modular and standards-based ecosystem can support flexible integration while preserving domain-specific autonomy. Central to this approach are the Interoperability Reference Architecture and the Plan-Track-Assess (PTA) framework, which enable coordination across diverse tools such as machine-actionable Data Management Plans (maDMPs), Scientific Knowledge Graphs, and FAIR assessment services.

OSTrails embeds FAIR principles into day-to-day research workflows by providing machine-assisted guidance, modular metrics, and contextual user support. This empowers researchers to incorporate and assess FAIR practices throughout the research lifecycle, promoting greater rigour and transparency.

Through co-designed pilots, the project validates interoperability at scale—from local institutional settings to federation with the European Open Science Cloud (EOSC). The emerging OSTrails Commons, a shared environment for services, methods, and training, will support long-term sustainability and community-driven adoption across the Open Science ecosystem.

This poster will present how the architecture scales across disciplines and infrastructures, and explore OSTrails'contribution to reproducibility, interoperable research ecosystems, and the development of a trusted Web of FAIR Data and Services.

Primary authors: PAPADOPOULOU, Elli (Athena); STAVROPOULOS, Tassos (OpenAIRE)

Presenter: STAVROPOULOS, Tassos (OpenAIRE)

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