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Introducing Galaxy: A new cloud and HPC gateway for data-driven computational research

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Galaxy is a scientific workflow and data analysis platform transforming data-driven research. It is focused on creating an open infrastructure for computational research that is robust, scalable, and integrated, allowing for federated computational infrastructures and democratization of research data analysis. Galaxy's efficient web-based, intuitive user interface embedded with thousands of essential tools enables scientists to conduct sophisticated analyses without extensive programming knowledge or technical skills. By breaking down technical obstacles, Galaxy fosters innovation and collaboration across the scientific community. Galaxy excels in reproducibility, creating a research environment where findings can be validated and built upon and strictly FAIR. Extensive dataset collections, training materials, workflows, and expert-crafted tools enrich Galaxy, making it a valuable resource for researchers in various domains.

Galaxy is not just a platform for data analysis; it facilitates learning and collaboration through dedicated and unique Training Infrastructure as a Service (TIaaS) and Virtual Research Environments (VREs). Through the EuroScienceGateway (ESG) project Galaxy serves as the Cloud and HPC gateway for computational research, empowering scientists with a user-friendly environment. Galaxy's versatility is evident in its application across diverse scientific fields, including life science, materials science, astrophysics, climate science, and more. In these domains, Galaxy aids in processing and analyzing complex problems, properties, and phenomena. This domain-agnostic nature highlights Galaxy's adaptability, contributing to its growing popularity among researchers from various disciplines.

With the European Galaxy server (<https://usegalaxy.eu>) serving 73K+ researchers globally, Galaxy stands as the new cloud and HPC gateway for domain-agnostic computational research, enabling scientists to navigate complex tools with ease without hindering their data analysis.

In this talk, we introduce Galaxy, its rich features and how Galaxy EU enables 73K+ researchers to conduct cutting-edge data-driven research by significantly reducing the computational challenges involved in complex data analysis.

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