

# The PITHIA e-Science Centre

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PITHIA-NRF (Plasmasphere Ionosphere Thermosphere Integrated Research Environment and Access services: a Network of Research Facilities) is a project funded by the European Commission's H2020 programme to build a distributed network of observing facilities, data processing tools and prediction models dedicated to ionosphere, thermosphere and plasmasphere research. One of the core components of PITHIA-NRF is the PITHIA e-Science Centre (PeSC) that supports access to distributed data resources and facilitates the execution of various prediction models on local infrastructures and remote cloud computing resources. As the project nears its completion in 2025, the e-Science Centre has now become a mature and widely utilised tool within the community. The PeSC facilitates the registration of Data Collections, that can either be datasets or prediction models. Registration utilises a rich set of metadata based on the ISO 19156 standard on Observations and Measurements (O&M) and a Space Physics Ontology to define the applicable keywords. While these standards are based on XML, a wizard is also available for resource providers that makes the creation of these XML files easier and more automated. Users can either browse the registered Data Collections, or search for them utilising free-text keywords or the Space Physics ontology. Once found, they can interact with the Data Collection by either navigating to its external site or accessing it through an Application Programming Interface (API) directly from the e-Science Centre. Data Collections can be deployed either at the providers premises or on EGI cloud computing resources. Data storage is facilitated by the EGI DataHub service. Besides Data Collections, the PeSC also supports the execution of workflows. Workflows can be composed of registered Data Collections and executed via APIs. User management in the PeSC is realised by the integration of the EGI Check-in federated identity management system and the Perun authorisation framework. While the PeSC is completely open to end users and anyone can access it without registration, the publication of Data Collections and workflows requires authentication and authorisation. Users belong to Institutions that own the Data Collections and only members of a certain Institution can manage the given resource. Handling of user tickets is managed by the GGUS ticketing system, also provided by EGI and fully integrated with the PeSC. Currently, there are 57 Data Collections and two workflows registered in the PeSC, represented by 790 XML files describing institutions, individuals, projects, platforms, instruments, etc., and made available to the wider PITHIA research community. The presentation and a live demonstration will explain the above functionalities of the e-Science Centre, give examples of PITHIA Data Collections and workflows, and outline the next steps in the development process. The PeSC can be accessed at <https://esc.pithia.eu/>.

## Topic

Needs and solutions in scientific computing: Platforms and gateway

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