



PITHIA-NRF

Plasmasphere Ionosphere Thermosphere Integrated
Research Environment and Access services:
a Network of Research Facilities



Workflows Registration

at PITHIA e-Science Centre

User Guide

Version 1.1

October 20, 2025



The PITHIA-NRF project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101007599

Table of Contents

1.	Terminology and Abbreviations	2
2.	Introduction	2
3.	Publishing Workflows	3

1. Terminology and Abbreviations

API	Application Programming Interface
DAG	Directed Acyclic Graph
eSC	e-Science Centre
URL	Uniform Resource Locator
Data Collection	[<i>standard PITHIA vocabulary</i>]: top-level metadata document for registration of provided measurements and model computations (final Step #12 of the registration)
Data Resource	Single data service item and its associated metadata, available through the PITHIA-NRF system.
Dataset	Pre-computed or pre-processed data resource available for download.
ISO	International Standards Organisation
Metadata Model	[<i>science-neutral</i>]: Specification of different documents and their contents that are required for registration of data resources
Ontology	[<i>science-specific</i>]: A set of standard vocabularies for the selected domain of science
Phenomenon	[<i>standard ISO vocabulary</i>]: A physical observable (a.k.a. “Mother Nature”). Not to confuse with events; phenomena are not defined in time or space. The top-level phenomenon categories are Field, Particle, and Wave.
Workflows	[<i>standard PITHIA vocabulary</i>]: A combination of different interconnected data collections executed repeatedly in an orchestrated pattern to produce its output result. The pattern in its general form is a directed acyclic graph (DAG) and in its simplest form, a linear sequence of steps.

2. Introduction

This document provides detailed instructions on how users can register and publish Workflows at the PITHIA e-Science Centre (eSC).

As mentioned in the related interface in the eSC, a Workflow is “*a combination of different interconnected data collections executed repeatedly in an orchestrated pattern to produce its output result. The pattern in its general form is a directed acyclic graph (DAG) and in its simplest form, a linear sequence of steps.*”.

3. Publishing Workflows

After logging in, registered users are presented with a landing page similar to the one shown in Figure 1. At the bottom of Figure 1, the user can see the institution they are a member of and select to manage their registrations (Figure 2), i.e. register new Data Collections, Workflows, and Static Datasets and/or edit the existing ones.

 **PITHIA**
e-Science Centre

Help & Support |  Aggeliki (National Observatory of ...) ▾

Data Collections ▾ Workflows ▾ Static Datasets ▾ Space Physics Ontology and Metadata Model ▾ Manage Registrations ▾ About PITHIA-NRF

PITHIA e-Science Centre

Data Collections

- [!\[\]\(c1c13e32f5099222ca8eb2c0edc64160_img.jpg\) ?
Search by Content](#)
- [!\[\]\(4d11ca7b3fd6face42df5840f6181c44_img.jpg\) ?
Simple Search](#)
- [!\[\]\(e0aa52f2e93c8a15a0abe3f6fd93da03_img.jpg\) ?
All Data Collections](#)
- [!\[\]\(deed1602b68c66088d7bdb8e2aaea4d3_img.jpg\) ?
Data Collection-related Metadata](#)

Workflows

- [!\[\]\(daf3bf731f4c930ce264b4e7fb604657_img.jpg\) ?
Search by Content](#)
- [!\[\]\(903db9fcd4c83dc79118047b1caee2a1_img.jpg\) ?
All Workflows](#)

Features of Interest

Real-world object that carries the property which is observed or modelled to produce a Data Collection.

- [SolarSystem
75 Data Collections](#)
- [SolarSystem: Celestial Body
72 Data Collections](#)
- [SolarSystem: Heliosphere
1 Data Collection](#)
- [SolarSystem: Sun
5 Data Collections](#)

Static Datasets

- [!\[\]\(deec3bd7ddc76f736b74a4f9de028b5f_img.jpg\) ?
Search by Content](#)
- [!\[\]\(f5c9d1670e99070850d6a31606c69e25_img.jpg\) ?
All Static Datasets](#)

Space Physics Ontology and Metadata Model

- [!\[\]\(ddf053eb7d80a50752b367feb43bce58_img.jpg\) ?
Space Physics Ontology Guide](#)
- [!\[\]\(a358e7dc9ec849b9f95475a99387789a_img.jpg\) ?
Space Physics Ontology Browser](#)
- [!\[\]\(20508942075fdd4f1fe8b4892be772d5_img.jpg\) ?
Space Physics Metadata Model](#)

Space Physics Ontology and Metadata Model

- [!\[\]\(a227b3274715a19fd8c194415dff3428_img.jpg\) ?
Space Physics Ontology Guide](#)
- [!\[\]\(860dacfbf347bc7ca257a278a0eaf30f_img.jpg\) ?
Space Physics Ontology Browser](#)
- [!\[\]\(d138f1aac46417c782dbc8b645712088_img.jpg\) ?
Space Physics Metadata Model](#)

Registration Help

- [!\[\]\(863b0a7ef845c59c49cc10414b828527_img.jpg\) ?
Data Resource Registration Guide](#)

National Observatory of Athens

- [Manage Registrations](#)
- [View Members](#)

e-Science Centre Institutions

- [Register a New Institution](#) ▾
- [Join Another Institution](#)

Contact Support | Privacy Policy | Terms of Use | About PITHIA-NRF |  Theme ▾

This work uses the EGI infrastructure with the dedicated support of IN2P3-IRES

© 2021-2025 PITHIA-NRF

Figure 1 – Landing page of a registered user with an active membership in an institution

National Observatory of Athens

- [Manage Registrations](#)
- [View Members](#)

Figure 2 – Manage registrations option for a specific institution

For users to publish Workflows, they must choose the "Manage Registrations" option, which directs them to the corresponding page, as shown in Figure 3.

The screenshot shows the PITHIA e-Science Centre homepage. At the top, there is a navigation bar with links for Data Collections, Workflows, Static Datasets, Space Physics Ontology and Metadata Model, Manage Registrations, and About PITHIA-NRF. Below the navigation bar, there is a logo for PITHIA e-Science Centre. The main content area is titled "Manage Registrations". Under this title, there are three buttons: "Data Collection-related Metadata", "Static Dataset-related Metadata", and "Workflows".

Figure 3 – Manage Registrations Page for a Specific Institution

As this guide focuses only on Workflows, the user must choose the option “Workflows”. This action directs users to the Workflow management page (Figure 4), where a user can register a new Workflow or update an existing one. This guide focuses on new registrations, specifically through the “Register with Wizard” option, which offers a graphical user interface.

The screenshot shows a web-based management interface for workflows. At the top left, there's a breadcrumb navigation: Home > Manage Registrations. Below it, the text "National Observatory of Athens" and the title "Workflows". On the left, there are two buttons: "Register via File Upload" and "+ Register with Wizard". A table lists three registered workflows:

Name	Updated by	Actions
Bottomside IONospheric response Solar Wind Magnetosphere driven (BONO_SWM) Workflow Workflow_SWIMAGD_IONO_pithia	A [redacted]	
Ionospheric Electron Density (Ion_ED) Workflow Workflow_Ion_ED_pithia	A [redacted]	
Total IONospheric response Solar Wind Magnetosphere driven (TINO_SWM) Workflow Workflow_TIONO_SWM_pithia	A [redacted]	

To the right of the table, a sidebar titled "Workflows" contains the following text: "A workflow is a combination of different interconnected data collections executed repeatedly in an orchestrated pattern to produce its output result. The pattern in its general form is a directe...". Below this is a link "Show more...". Further down, it says "3 registered" and "No outdated registrations found".

Figure 4 – Workflows Management Page

Having selected the “Register with Wizard” option (Figure 4), users see a form where they must enter all related information. The mandatory fields are indicated by a red asterisk.

The information is divided into the following categories:

1. **New Workflow** (Figure 5), where users must:
 - a. Provide the name of the Workflow.
 - b. Select from the drop-down list the associated organisation.
2. **Identifier** (Figure 6), which includes dynamically generated information specifically for the eSC. Here, the users can only modify the metadata version.
3. **Description** (Figure 7), where the user describes the registration that will be shown when someone finds and reads the specific registration-related information.
4. **Data Collections** (Figure 8), where you select the Data Collections associated with the Workflow from a drop-down list, namely those that comprise the Workflow. A full list of the eSC registered Data Collections can be found at <https://esc.pithia.eu/data-collections/>.
5. **Link to an OpenAPI Specification** (Figure 9), where users must:
 - a. Provide an OpenAPI Specification URL, through which the Workflow runs.
 - b. Provide a brief description of what the API can do.
6. **Workflow Details** (Figure 10), where a file with further details on the Workflow, including a graph diagram of the flow, must be provided either by uploading a pdf file or by providing a link to the file.

7. **Validate and Register** (Figure 11), once all the above options are complete the user clicks the “Validate and Register” button, and the eSC completes the registration providing a confirmation message.

The screenshot shows a web-based form titled "New Workflow". At the top left, there is a breadcrumb navigation: Home > Manage Registrations > Workflows. On the left side, a sidebar lists "Metadata Sections" including: Full Name and Organisation, Identifier, Description, Data Collections, Link to an OpenAPI Specification, and Workflow Details. The main content area has a header "National Observatory of Athens" and the title "New Workflow". It contains two input fields: "Workflow Full Name *" and "Organisation Associated With the Workflow *". A note at the top of the input fields states "* indicates a required field". On the right side, a "Wizard Menu" section says "Changes are automatically saved in your browser (except for files)." with "Save" and "Reset" buttons.

Figure 5 – Workflow: Full Name and Associated Organisation

The screenshot shows a web-based form titled "Identifier". The sidebar on the left lists "Metadata Sections" including: Full Name and Organisation, Identifier, Description, Data Collections, Link to an OpenAPI Specification, and Workflow Details. The main content area has a header "Identifier" and a single input field for "Metadata Version *". A note below the field says "The version number of the object being identified." with a value "1" entered. On the right side, a "Wizard Menu" section says "Changes are automatically saved in your browser (except for files)." with "Save" and "Reset" buttons.

Figure 6 – Workflow: Identifier

The screenshot shows a web-based form titled "Description". The sidebar on the left lists "Metadata Sections" including: Full Name and Organisation, Identifier, Description, Data Collections, Link to an OpenAPI Specification, and Workflow Details. The main content area has a header "Description" and a large text input area containing a detailed description of the workflow. A note above the input area says: "A free-text description of the workflow: list of individual data collections that are included in the graph. The workflow designer will also upload the diagram of the graph of undertaken execution steps using the workflow registration page at e-Science Centre. The description and the graph diagram will be reviewed for implementation by the system engineers. Only this description text will be searchable at eSC, not the graph diagram." On the right side, a "Wizard Menu" section says "Changes are automatically saved in your browser (except for files)." with "Save" and "Reset" buttons.

Figure 7 – Workflow: Description

Metadata Sections

Full Name and Organisation

Identifier

Description

Data Collections

Link to an OpenAPI Specification

Workflow Details

Data Collections

Data collections contributing to the workflow.

Data Collection 1 *

Data Collection 2 and others *

Wizard Menu

Changes are automatically saved in your browser (except for files).

Save

Reset

Figure 8 – Workflow: Data Collections

Metadata Sections

Full Name and Organisation

Identifier

Description

Data Collections

Link to an OpenAPI Specification

Workflow Details

Link to an OpenAPI Specification

OpenAPI Specification URL *

Description

E.g. a brief description of what the API can do

Wizard Menu

Changes are automatically saved in your browser (except for files).

Save

Reset

Figure 9 – Workflow: Link to an OpenAPI Specification

Metadata Sections

Full Name and Organisation

Identifier

Description

Data Collections

Link to an OpenAPI Specification

Workflow Details

Workflow Details *

A file with further details, including a graph diagram of the flow. Choose below whether to upload the file or to provide a link to it.

File Upload

Browse... No file selected.

Accepted formats: PDF

Link to the Workflow Details File

https://

Use this option if you would like to link to a workflow details file outside the e-Science Centre. If choosing this option, we recommend:

- The workflow details file is in PDF format.
- The link points directly to the workflow details file.

Wizard Menu

Changes are automatically saved in your browser (except for files).

Save

Reset

Figure 10 – Workflow: Workflow Details

Validate and Register

Figure 11 – Workflow: Validate and Register