



OSCARS

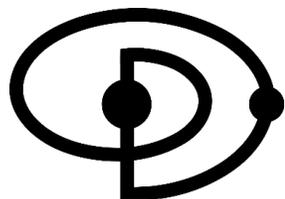
Open Science Clusters' Action
for Research & Society

Funded Project (OPAL)

Ontology Portal for Astronomy Linked-data

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Observatoire
de Paris



Funded by
the European Union

Fragmentation of Semantic Artefacts Across Astronomy (Sub-)Communities

- Semantic artefacts (vocabularies, schemas, ontologies, etc.) are scattered across ecosystems and organizations e.g., IVOA, IPDA, and IHDEA
- Each sub-community (celestial astronomy, planetary sciences, heliophysics) developed its own standards in isolation.
- Cross-domain science/interoperability requires semantic alignment that is currently missing.



Lack of Semantic Web–Ready, FAIR-Compliant Semantic Artefact Representations

- Artefacts exist in different formats/representations not necessary compliant with semantic web standards (OWL/RDF/SKOS).
- Limits integration with EOSC services and knowledge graphs (e.g., ESCAPE cluster, OpenAIRE, etc.)

Limited Discoverability and Reuse of Data

- Astronomy datasets (especially “long tail” data) lack consistent semantic annotations.
- Provenance, instrument modes, observation contexts require richer ontologies to support modern digital workflows.



OntoPortal-Astro: A Dedicated Semantic Artefact Catalogue for Astronomy

- New OntoPortal instance dedicated to astronomy and ESCAPE communities. Consolidation of vocabularies into a single SAC.
- Use of the OntoPortal technology (already proven in BioPortal, AgroPortal, EcoPortal, EarthPortal).
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Semantic “Lifting” and Formalization of Existing Artefacts

- Conversion of existing XML schemas and term lists into RDF, OWL, and SKOS.
- Support to domain experts through ontology engineering expertise.
- Alignment and mapping between vocabularies (e.g., reference frames, facilities, instruments).

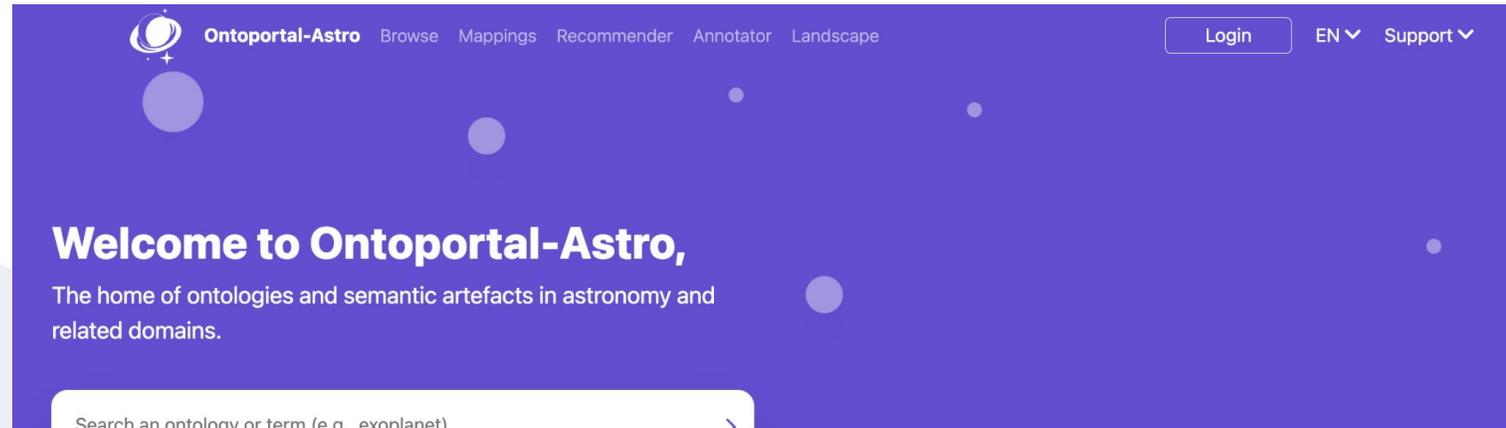
Governance, FAIRness Assessment and Community Integration

- Creation of an Advisory and User Group (AUG) across astronomy sub-communities.
- Development of guidelines for submission, update, and curation of vocabularies.
- Adapted FAIR assessment framework for astronomy semantic artefacts.
- Feedback loop into astronomy organizations governance processes.

What are the key results achieved to date and how have you made them available to the broader community?

<https://ontoportal-astro.eu>

Contains 30 ontologies and 14 users.



Welcome to Ontoportal-Astro,
The home of ontologies and semantic artefacts in astronomy and related domains.

Do you want to share an ontology?

Uploading an ontology or another semantic artefact (vocabulary, terminology, thesaurus, ...) is a way of sharing your knowledge with others. By uploading and sharing your ontology to Ontoportal-Astro, you can:

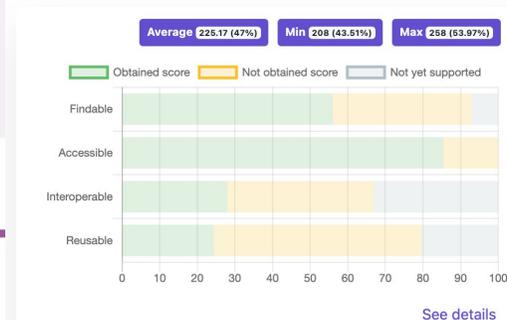
Ontoportal-Astro slices

Slices allow users to interact (both via API or UI) only with a subset of ontologies in OntoPortal-Astro. If browsing the slice, all the portal features will be restricted to the chosen subset, enabling users to focus on their specific use cases. On OntoPortal-Astro, slices and groups are synchronized, so every group has a corresponding slice displaying only the ontologies from that group.

26 International Virtual Observatory Alliance (ivoa) 2 International Heliophysics Data Environment (iheda)

2 International Planetary Data Alliance (ipda) Suggest a new group/slice +

FAIR Score



How will make your results sustainable over time - How will the scientific community/-ies further exploit them?

- Hosting at Observatoire de Paris (PADC) with experimentation on EOSC infrastructure (EGI).
- Future participation in the OntoPortal federation
 - allowing cross-domain discovery
 - joining OntoPortal Federated Service (brought by Data Terra Node)
- Long term support provided by Observatoire de Paris and other relevant astronomy research infrastructures

Who has been doing it?

- Clement Jonquet & Baptiste Cecconi (Co-PIs)
- Elsa David & Liza Fretel (research & semweb expertise and community support)
- Imad Bourouche (developer)
- Advisory User Group (8 domain experts)



All aligned on the right meridian!

https://en.wikipedia.org/wiki/Paris_meridian

Remember: if you produce a semantic artefact in one of the OSCARS project... talk to us... we certainly have a Semantic Artefact Catalogue for it!



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AgroPortal
Agri-food
INRAE, University
of Montpellier



EarthPortal
Earth sciences
CNRS, Data Terra



EcoPortal
ogy & Biodiversity
LifeWatch ERIC



Ontoport-Astro
Astronomy
Paris-PSL Observatory



BioPortal
Biomedicine
Stanford University

And other things... OLS

SocioPortal
Social sciences
(CESSDA)
HSPortal / CHPortal

Heritage Science &
Cultural Heritage
(E-RIHS & ECHOES)