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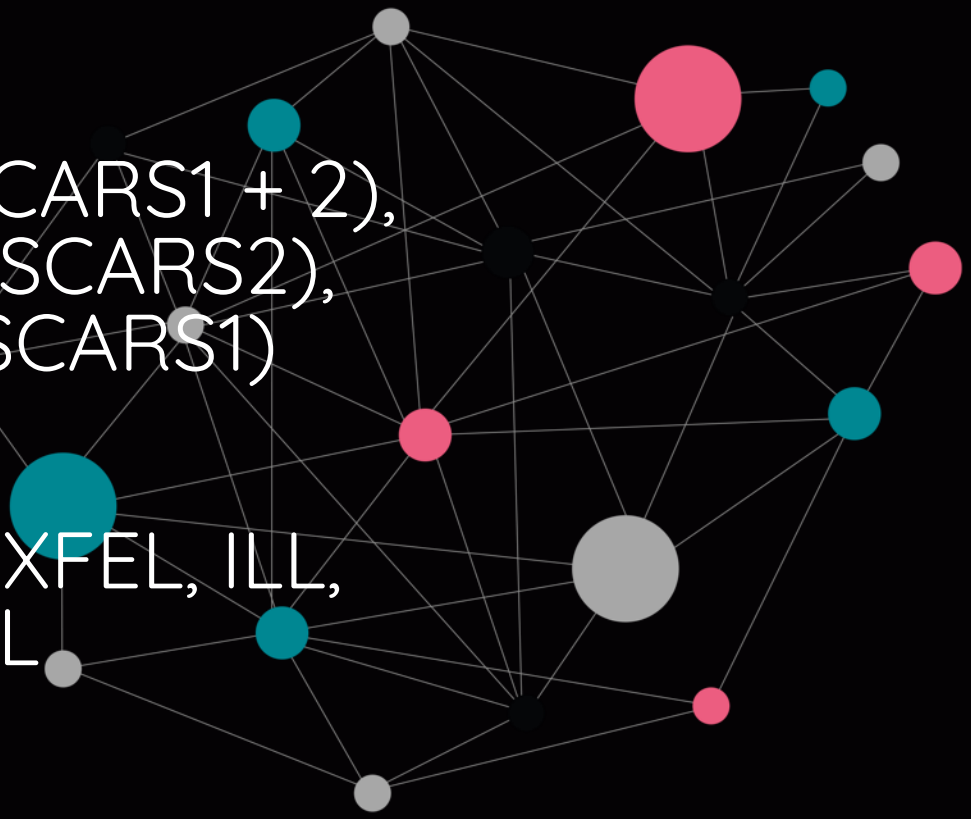
PaNOSC Node in OSCARS2

OSCARS PanOSC Partners – ESRF(OSCARS1 + 2),
HZDR (OSCARS2),
DESY (OSCARS1)

PaNOSC Partners - ELETTRA, ESS, EUXFEL, ILL,
MAXIV, PSI, SOLEIL



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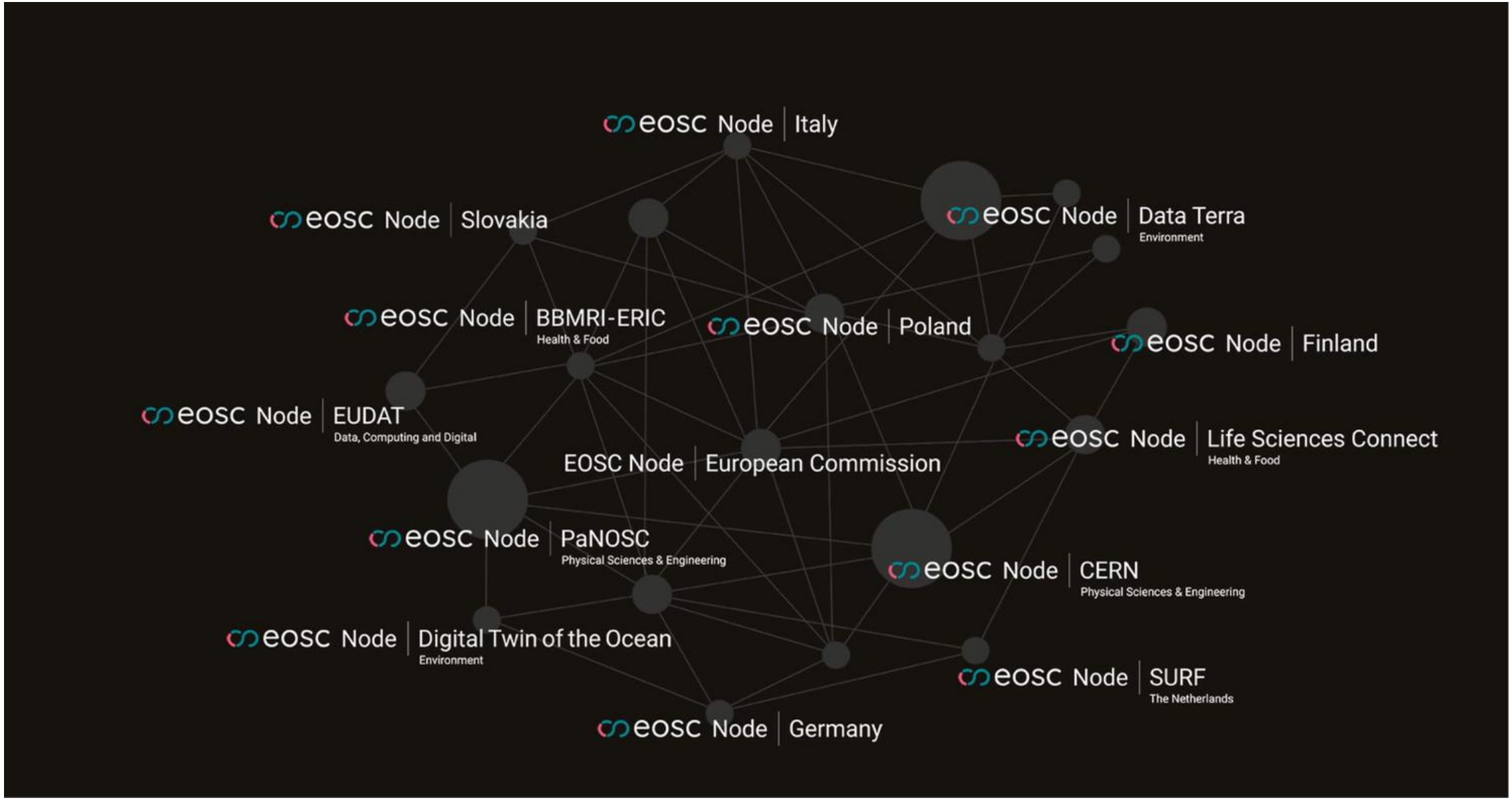
The Future of EOSC is the Federation !



EOSC → the future of EOSC is the Federation

https://eosc.eu/building-the-eosc-federation

EOSC Federation launched at the EOSC Symposium 2025

ESRF signed the EOSC Federation MoU on behalf of the community

PaNOSC – Collaboration started in 2015

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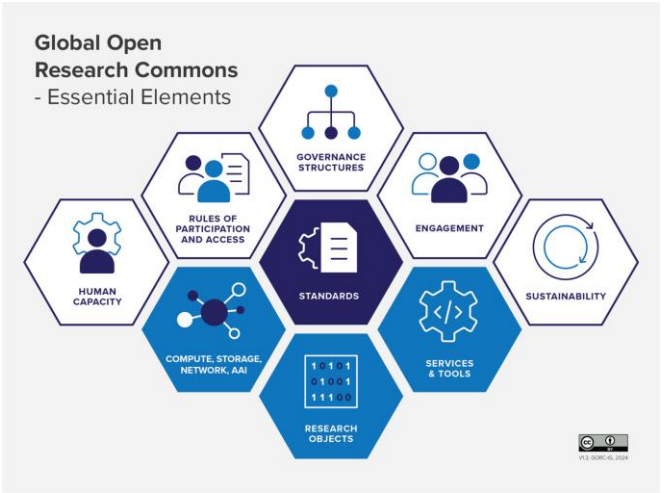
https://eosc.panosc.eu/



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PaNOSC Node - purpose

https://www.panosc.eu/panosc-eosc-node/

- **Photon and Neutron (PaN) sources** are **analytical facilities** for studying matter from the **nanometer to the meter scale** serving **tens of thousands of researchers** every year producing **petabytes of unique data**
- **PaNOSC Node** will build on the **PaNOSC, ExPaNDS + OSCARS INFRAEOSC** projects to continue the process of making data from PaN RIs **FAIR**, i.e. higher quality reusable and reused data

- **PaNOSC Node will provide researchers** with scientific workflows and tools to process data, data repositories services for both humans and machines, i.e., AI
- **Aligning data practices at the European Photon and Neutron sources** via EOSC will increase the scientific impact of the RIs and increase the return on investment of these facilities (which cost billions of euros)
- **Our goal is to extend the mission of the RIs to be sources of FAIR data!**

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PaNOSC Node – main benefits

https://www.panosc.eu/

- Make **access to PaN data** more systematic and easier
- Provide **processed data** to the research community

- **Provide researchers** with the workflows, repositories and services to produce processed data more efficiently for humans and machines + AI
- **Improve data quality** - systematically make data FAIR and more widely known to increase the scientific impact of the PaN RIs.
- **Improved data services** –processing, download, search, AI-based tools.
- **Scientific applications** – in many scientific domains
- **Build community** – of Open Scientists

PaNOSC Node – objectives in OSCARS2

Main objectives as part of the EOSC Federation:

- **PaNOSC Node** will move into **operation by October 2026** and prepare and participate in the post-2027 activities
- **PaNOSC Node** needs to **build the Open Science community** and improve its services based on User feedback

- **AAI in production** – needs new Rules of Participation
- **Operate Node Services** – PaN-Finder, VISA, User Space, Website, …
  - **Increase data reuse** - improve searching + finding
  - **AI in production** - make data reusable by AI/ML
- **Participate in EOSC Federation Working Groups** – Node Coordinators, Operations, Working Groups (Training, Handbook, VREs, Research Resources)

PaNOSC Node – what to do in OSCARS2

- **Governance + RoP** – extend Rules of Participation to include Data Proposals i.e. users who only want access to data + compute
- **Extend the following PaNOSC Node Services** –
  - **PaN-Training* - using outcome of mTeSS-X project**
    - **extend training to cover more aspects of PaN science**
    - **Provision of a multi-space catalogue of materials for all science clusters**
  - **PaN-Finder*** – **integrate local searching + publications**
  - **VISA*** – **provide** customised **VMs for scientific applications**
  - **Workflows** – develop + share workflows for PaN data processing
  - **User Space** – harmonise + federate user space with other nodes

PaNOSC Node – what to do in OSCARS2

- **Extend the following PaNOSC Node Services (continued)**
  - **Website** – link data to publications + make data publications
  - **Data catalogues** – build and federate domain portals with other portals
    - Rolling out D3A (Direct DOI Dataset access) support
  - **Metadata** – improve metadata for publications, AI/ML and data reuse
    - PaNET adoption across facilities.
    - Scientific metadata interoperability.
    - Beamline DOIs, for impact tracking.
  - **Community building** – build a community of Open Scientists
    - In addition integration of RSE communities
  - **Cross node data service** – searching across nodes e.g. DAPHNE catalogue
  - **AI Data Agents** - develop and share AI MCP Agents for finding + processing data

OSCARS2 Open Calls – PaNOSC needs

56 proposals in OSCARS1 related to PaNOSC, 15 were PaNOSC only

- **Building the community** – in OSCARS2 we want to build on OSCARS to create a community of Open Science practitioners who can help other scientists adopt OS practices

- **Open Calls** – encourage proposals which help community efforts working on metadata, data catalogues, ontologies, linking to other data catalogues, working with publishers to improve data citations, data publications + reuse, AI powered data evaluation and reuse, AI MCP agents for finding, curating, processing and reusing data

OSCARS1 Projects – PaNOSC reuses + sustains

The following projects funded in OSCARS1 will deliver results which will be widely adapted and onboarded in PaNOSC:

- **HEFTIE – data format for huge data volumes (OME-Zarr)**
- **MC-ReDD – standardising metadata for publishing raw data (IUCr)**
- **mTeSS-X – PaN training platform and service catalogue**
- **PaN-Finder – AI tool for searching for and evaluating datasets**
- **VISA – a remote data analysis platform for open data**

The other projects are services from a single site but will be onboarded in the PaNOSC Node if they comply with the PaNOSC Node requirements for Open + FAIR

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PaNOSC in OSCARS2 - science use cases

New Data Atlases for scientific domains - already planned

- Human Organ Atlas - complete human body
- Historical musical instruments
- Egyptian mummies
- Cultural heritage
- Building materials
- Batteries

Data catalogs from OSCARS1 - to be onboarded and sustained

- Proteins - Faill2Fair
- Materials Science - MatScatNet
- AIScope - Reflectometry
- AmbCat - Paleontology

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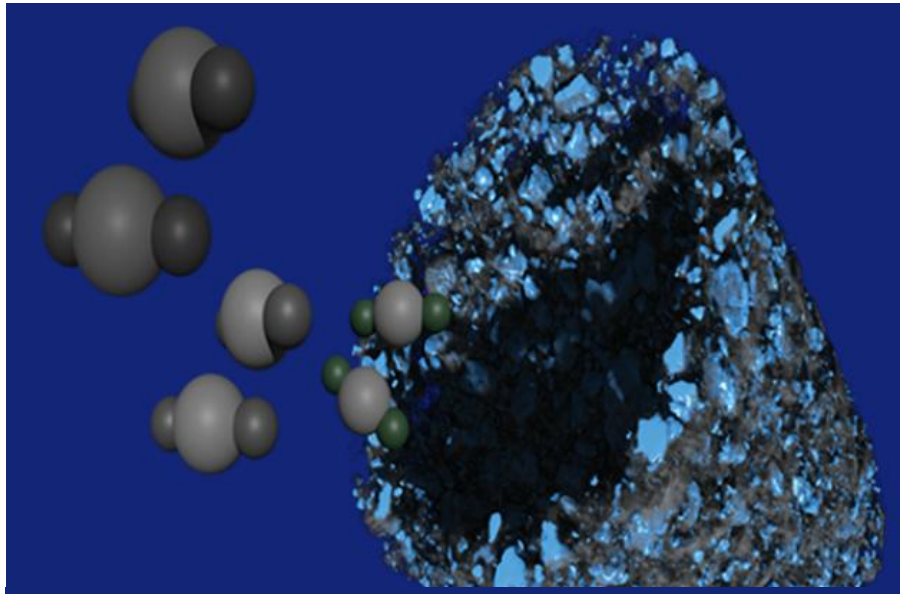
PaNOSC in OSCARS2 - science use cases

→ **Building Materials atlas :**

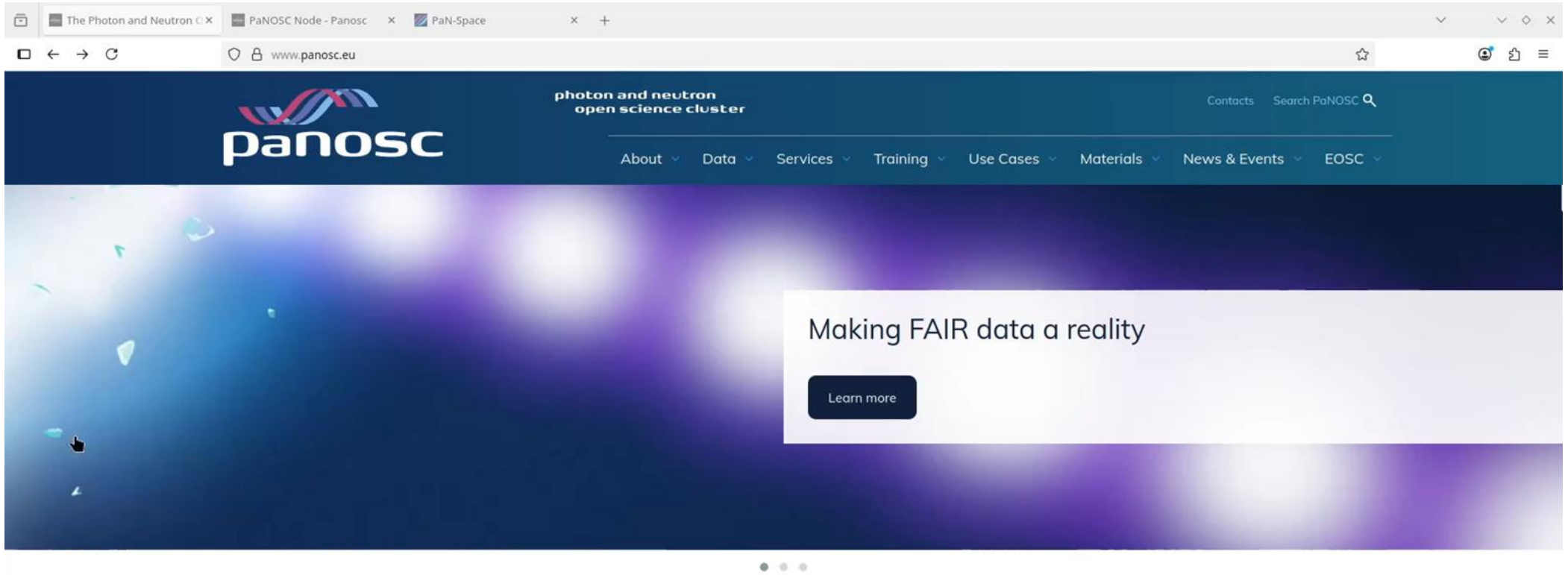
… Another aim of this project is to create a ***unified data analysis workflow****. “****The bottleneck in experiments is not the experiments themselves, but the data analysis. We want to create a pipeline where scientific results, one level above processed data, can be easily exported to interested parties****”, explains Miguel Aranda.*
In this respect, ***Aranda envisages the creation of a so-called Atlas for building materials, where experts could access data information in a centralised system****.*
Moreover, to this end, each of the X-SeeO$_2$ partners has secured funding for a Postdoctoral researcher that will analyse data for the consortium …



12-01-2026

X-SeeO2 is a European Innovation Council (EIC) Pathfinder project led by the University of Málaga (Spain), aiming to use cements as CO2 sinks. The project will develop technology for in situ CO_2 mineralisation studies at the ESRF to evaluate innovative cement formulations. The project will run until the end of 2029.

PaNOSC – video of node demo



The Photon and Neutron Open Science Cluster (PaNOSC)

The Photon and Neutron Open Science Cluster (PaNOSC) is the Science Cluster representing Photon and Neutron European Research Infrastructures (RIs), developing and providing services for its scientific community and connecting these to the European Open Science Cloud (EOSC).