



# The EOSC EU Node

<https://open-science-cloud.ec.europa.eu/>

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*DG CNECT C.1*





EUROPEAN OPEN  
SCIENCE CLOUD

# What is EOSC



## ***A process***

- Accelerate Open Science, FAIR data management and use of digital methods and services
- Stimulate co-operation in science and research, new insights and innovations, higher research productivity and improved reproducibility in science.


## ***An open, trusted, federation of infrastructure***


- Access existing Research Infrastructures in Europe;
- Enable circa 2 million European researchers to store, share, process, analyze, and reuse research digital objects (e.g. data, publications and software)

## ***An evolving ecosystem***

- Bringing together the European Commission, the governments and the many R&I stakeholders involved in the European Research Area
- Co-created across European, national, and institutional levels

# European Open Science Policy



EUROPEAN UNION 

# HORIZON EUROPE

#HorizonEU

June 2021




*"Horizon Europe will set a new standard for dissemination of knowledge and new skills across European societies. With clear and immediate open access requirements for beneficiaries, the Open Research Europe publishing platform and a strengthened European Open Science Cloud, we are well underway in making truly open science a reality."*

Mariya Gabriel Commissioner for Innovation, Research, Culture, Education and Youth

## OPEN SCIENCE


### EARLY KNOWLEDGE AND DATA SHARING, AND OPEN COLLABORATION

The challenge is for Europe **to embrace open science as the modus operandi for all researchers**. Open science consists in the sharing of knowledge, data and tools as early as possible in the Research and Innovation (R&I) process, in open collaboration with all relevant knowledge actors, including academia, industry, public authorities, end users, citizens and society at large. Open science has the potential to increase the quality, efficiency and impact of R&I, lead to greater responsiveness to societal challenges, and increase trust of society in the science system.



### What are open science practices?

- Open access to research outputs such as publications, data, software, models, algorithms, and workflows;
- Early and open sharing of research, for example through preregistration, registered reports, pre-prints, and crowd-sourcing of solutions to a specific problem;
- Use of open research infrastructures for knowledge and data sharing;
- Participation in open peer-review;
- Measures to ensure reproducibility of results, and
- Open collaboration within science and with other knowledge actors, including involving citizens, civil society and end-users, such as in citizen science.

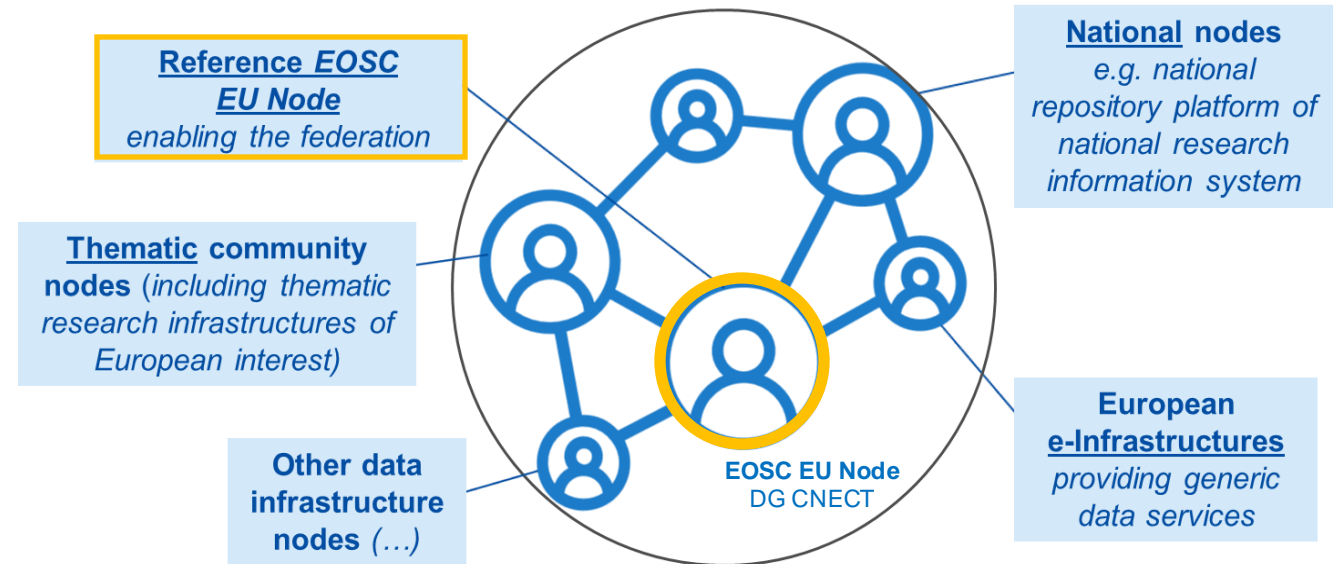


1. Open Data: FAIR (Findable, Accessible, Interoperable and Re-usable data) and open data sharing should become the default for the results of EU-funded scientific research.
2. **European Open Science Cloud (EOSC)**: a 'federated ecosystem of research data infrastructures' will allow the scientific community to share and process publicly funded research results and data across borders and scientific domains.
3. New Generation Metrics: New indicators must be developed to complement the conventional indicators for research quality and impact, so as to do justice to open science practices.
4. Future of scholarly communication: all peer-reviewed scientific publications should be freely accessible, and the early sharing of different kinds of research outputs should be encouraged.
5. Rewards: research career evaluation systems should fully acknowledge open science activities.
6. Research integrity: all publicly funded research in the EU should adhere to commonly agreed standards of research integrity.
7. Education and skills: all scientists in Europe should have the necessary skills and support to apply open science research routines and practices.
8. Citizen science: the general public should be able to make significant contributions and be recognised as valid European science knowledge producers.

# EOSC EU Node's role in the EOSC Federation

EOSC Federation (aka. EOSC Data Space)

- EOSC Federation must be established as a **European Common Data Space** for Research and Innovation
- EOSC Data Space is a distributed system of system with **multiple EOSC Nodes**.
- EOSC Nodes are being formulated as we speak, driven by the EOSC Tripartite Governance via the official Node Candidates Dialogue process
- **EOSC EU Node is just the first reference implementation of an operational node**



## EOSC EU Node

- EOSC EU Node has been kick-started by DG CNECT (procurement and deployment)
- EOSC EU Node currently offers core federating capabilities (operations, business-as-usual)
- **The future role of the EOSC EU Node depends on the build-up phase and capabilities of the EOSC Federation**

# EOSC EU Node: Technical and Public Launch

**18 September 2024** – ERA Stakeholders Conference, Brussels, Belgium



During the [ERA Stakeholder Conference](#) held on 18-19 September 2024 in Brussels, the upcoming launch of the European Open Science Cloud (EOSC) EU Node was announced. *Iliana Ivanova, the European Commissioner for Innovation, Research, Culture, Education, and Youth, highlighted EOSC and the EU Node in her keynote speech as an example of collaborative efforts aimed at promoting Open Science across Europe.*

**10 October 2024** – Technical Launch Event, Brussels, Belgium



This event marked a significant milestone and provided the opportunity for panel discussions surrounding the EOSC Federation build-up and European data spaces.



<https://www.youtube.com/watch?v=67mirPt-FhY>

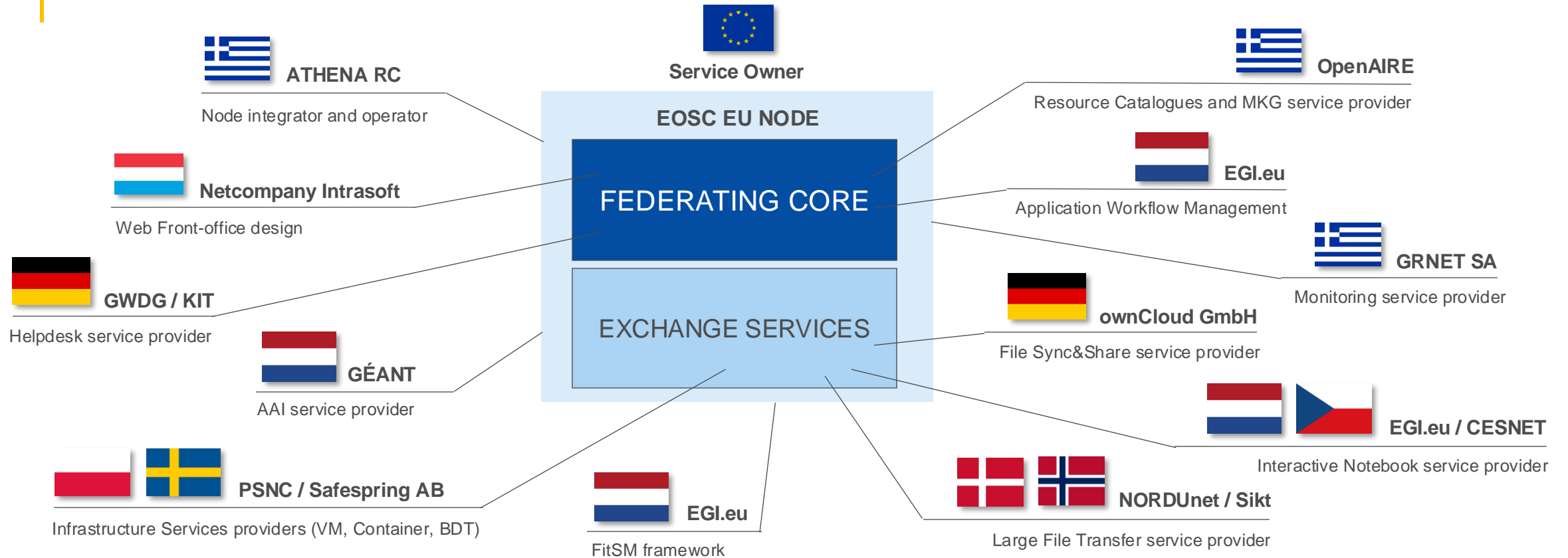
**22 October 2024** – EOSC Symposium, Berlin, Germany



The recent [EOSC Symposium in Berlin](#) (October 21-23) was a landmark event, marking the **official launch** of the EOSC EU Node and showcasing its potential to enhance the development of an integrated and effective digital research ecosystem.

<https://open-science-cloud.ec.europa.eu/>

# EOSC EU Node



## SELECTED NODE CANDIDATES



# Unique Features - New User Experience

- **Authentication, Authorization, Accounting (AAA)**

- eduGAIN and EU Login (with eIDAS) integration
- Policy-based Access Control (PBAC) retrieving user attributes from home IdP
- Virtual Credits and Wallets (personal, group)



- **Contributor tiers (discoverable, onboarded, native)**

- Resource Hub collecting 127 mil research objects from OpenAIRE, CORDIS, data.europa.eu, Software Heritage and more
- Curation service for resource object owners
- Recommendations, Favourites, Persistent Identifiers



- **Integrated User Space with Automated deployment workflows**

- TOSCA templates into Virtual Machines and Kubernetes containers
- Application and Data to Infrastructure



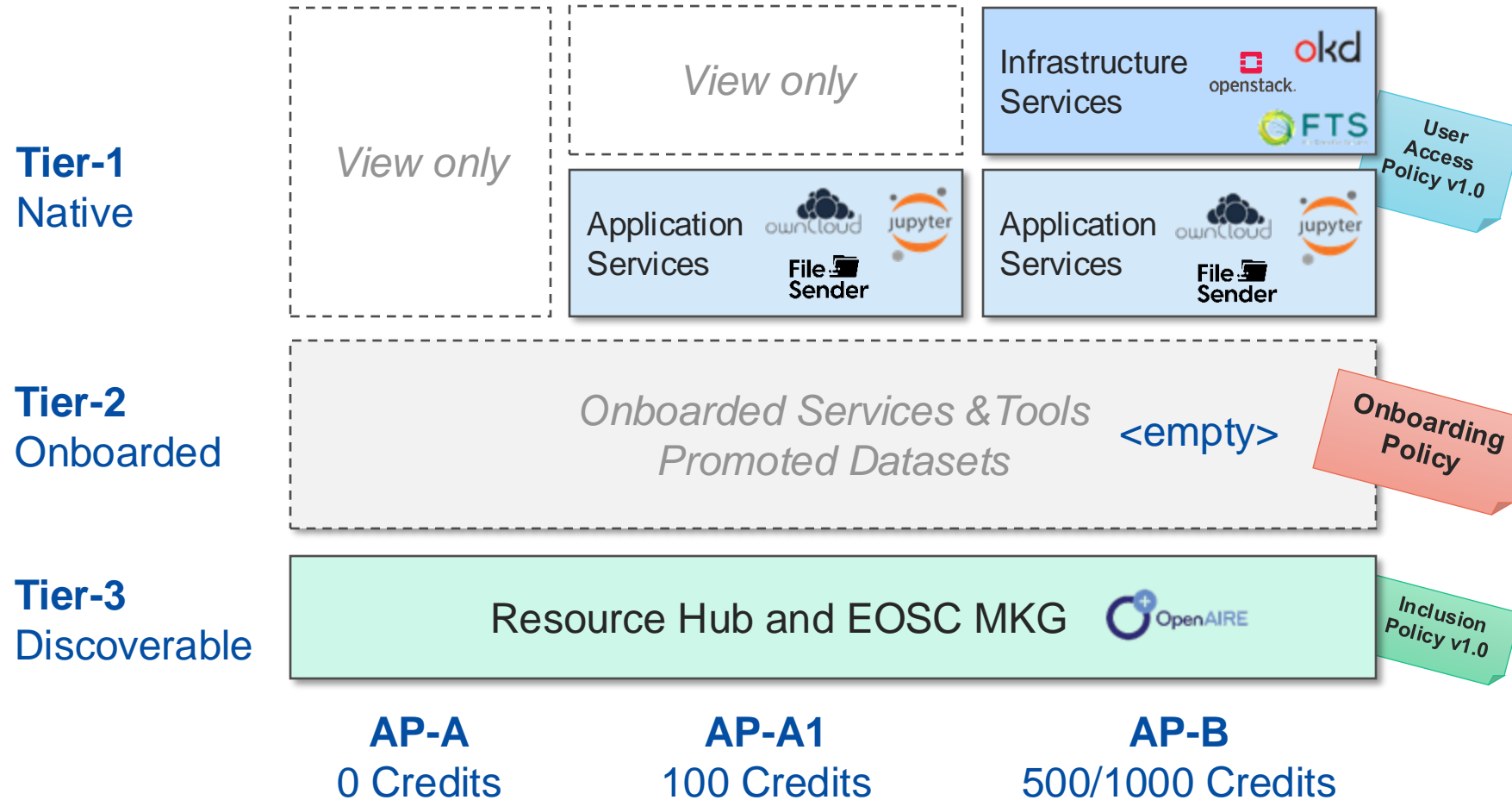
- **Monitoring and Helpdesk**

- Availability dashboard and support for end-users



# Access Policy and Contributor tiers

Contributor Tiers



**Services procured for the EOSC EU Node**

ORDERING FUNCTION FOR GATED RESOURCES

**Piloted with Candidate Nodes in 2025**

**Virtual credits and access model**

ATTRIBUTE-BASED AAA

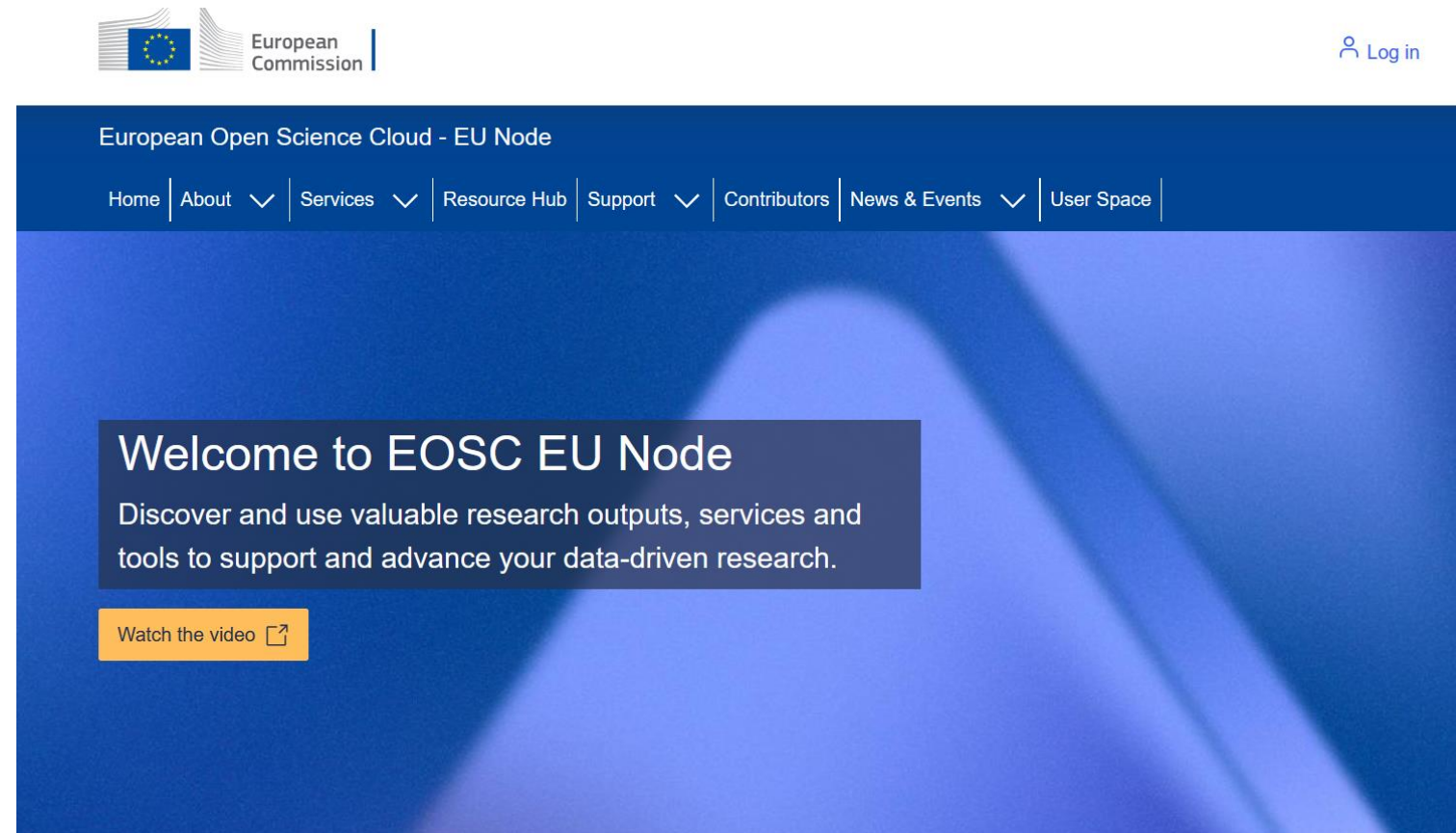
**Access Policy Groups**

# EOSC EU Node

Services

# Front Office

- Your **entry point** to the EOSC EU Node
- **Resource Hub**
- **EOSC EU Node Services**
  - Application Services
  - Infrastructure Services
- **Support**
  - Helpdesk
  - FAQ
  - Documentation
  - Training material
- **User Space**



# Resource Hub

- **Discover ~130M resources**
  - OpenAIRE, EC data sources
  - Harvested & indexed
- **Resources**
  - Publications
  - Data
  - Software
  - Services
  - Data Sources
  - Training
  - Tools

The screenshot displays the 'Resource hub' interface. At the top, there's a breadcrumb 'Home > Resource hub'. Below it, the title 'Resource hub' is followed by a search bar containing 'Publications' and a search button. A navigation menu includes 'All resources', 'Publications' (selected), 'Data', 'Software', 'Other Products', 'Services', 'Data Sources', 'Training', 'Interoperability Guidelines', and 'Tools'. On the left, a sidebar lists filters: 'Access right', 'Scientific domain', 'Document type', 'Publication date', and 'Funder', each with an upward arrow. The main content area shows 'Showing 1 to 20 of 92,379,287 resources'. Below this, there's a section for 'No filters applied' with a 'Relevance' dropdown. The featured resource is a 'PUBLICATION' titled 'Excited states time evolution on a laser-ablated molybdenum plume'. It includes metadata: Year: 2014, Views: 0, Downloads: 0, Citations: 3. The abstract describes the dynamics of excited states on a laser-ablated Mo plume. The author list includes C. A. B. Silva, Jayr Amorim, E. M. A. Sternberg, N. A. S. Rodrigues, and Maria Esther Sbampato. The publisher is 'Applied Physics B Photophysics and Laser Chemistry' and the identifier is '10.1007/s00340-014-5786-1'. At the bottom, there are 'Source' and 'Citation' buttons.

Home > Resource hub

## Resource hub

Publications Search resources Q Search

All resources **Publications** Data Software Other Products Services Data Sources Training Interoperability Guidelines Tools

Access right ^  
Scientific domain ^  
Document type ^  
Publication date ^  
Funder ^

Showing 1 to 20 of 92,379,287 resources

No filters applied Relevance ^

**PUBLICATION** ARTICLE, JOURNAL ☆

Year: 2014 | Views: 0 | Downloads: 0 | Citations: 3

**Excited states time evolution on a laser-ablated molybdenum plume**

The dynamics of the excited states on a laser-ablated Mo plume was studied, both in air and in vacuum, by emission spectroscopy along the plume expansion axis. The emission related to ionized atoms occurs in the beginning of the plume expansion, near the metal surface, and is predominantly ultraviolet emission. In the...

**Author** C. A. B. Silva | Jayr Amorim | E. M. A. Sternberg | N. A. S. Rodrigues | Maria Esther Sbampato  
**Publisher** Applied Physics B Photophysics and Laser Chemistry | Unknown Repository  
**Identifier** 10.1007/s00340-014-5786-1 | 2014385100

Source Citation

# Application Services

- **File Sync and Share**

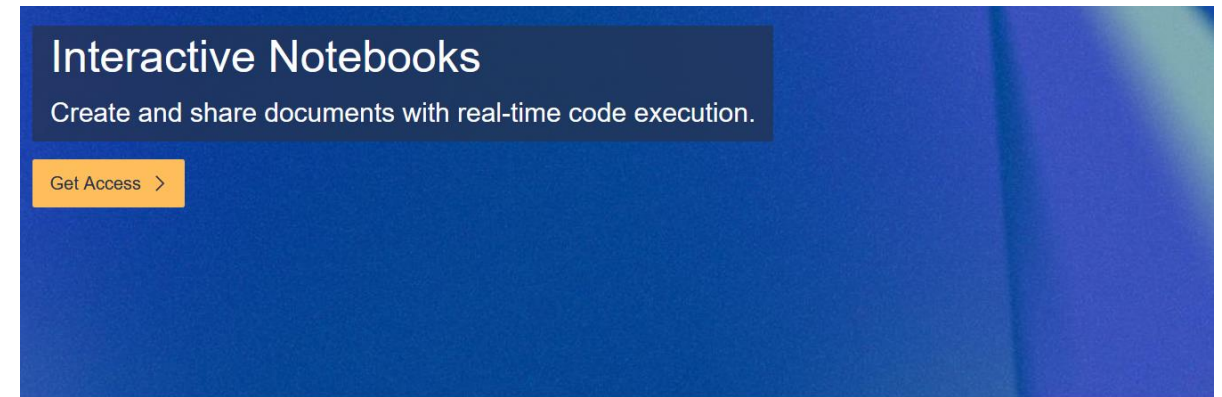
- Your personal cloud storage
- Upload and share files
- Productivity suite

- **Interactive Notebooks**

- Jupyter
- Multiple environments
- Multiple kernels

- **Large File Transfer**

- Securely share files



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Benefits

Features

Service Capabilities

How it works

User Resources

## Service Overview

Interactive Notebooks are a browser-based tool designed for interactively analysing data. Based off the Jupyter Hub, they enable you to create and share documents that include live code, equations, visualisations, and explanatory text. With Jupyter's support of all programming languages, including R and Python, the service seamlessly integrates text, mathematical equations, computational code, and multimedia outputs. Capable of scaling to accommodate multiple users and servers, the Notebooks are key in facilitating collaboration.

These Notebooks provide a versatile and interactive platform that facilitates different aspects of the research process, fostering transparency, collaboration, and reproducibility across diverse research fields. With the Interactive Notebooks, you can collaborate more effectively, streamline your workflows, and enhance the transparency and reproducibility of your research. Empower your research endeavours with real-time collaboration and visualisation capabilities, revolutionising the way you analyse and share data.

# Infrastructure Services

- **Virtual Machines**

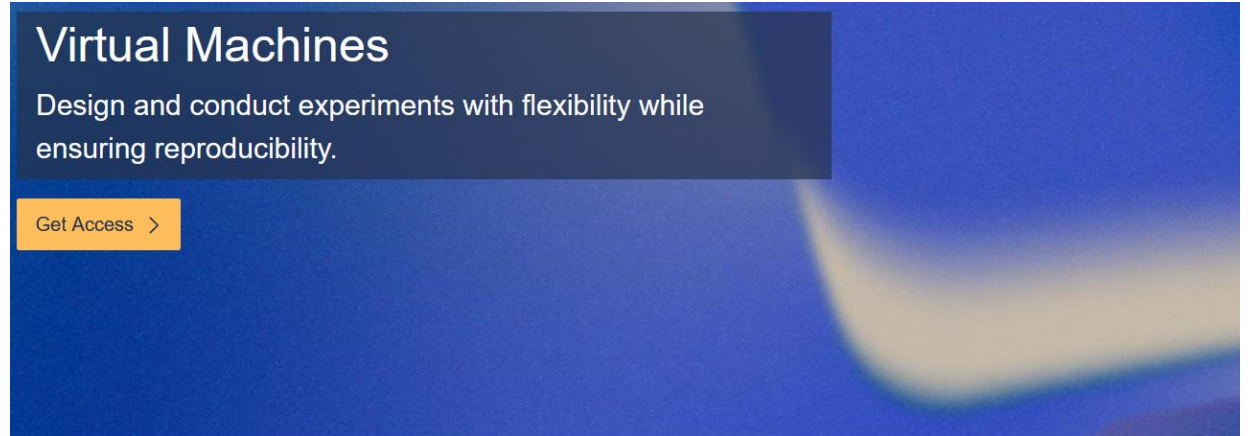
- Open Stack
- Multiple environments
- VM templates
- GPU support

- **Cloud Container Platform**

- OKD
- Multiple environments
- GPU support

- **Bulk Data Transfer**

- Site-to-site large data transfer



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## Service Overview

Virtual Machines (VM) offer a dynamic approach to computing and storing data in the cloud. The service is delivered through the industry standard open-source implementation OpenStack. Researchers are provided compute resources to launch their own VMs to create isolated environments for experimenting with different configurations, software setups, or algorithms. The compute resources can be used to create reproducible research environments. By packaging the entire software stack and data dependencies within a VM image, researchers can ensure that their experiments can be easily replicated by others, enhancing the credibility and transparency of their research.

Virtual Machines offer researchers a flexible, scalable, and secure computing environment for conducting experiments, analyzing data, and collaborating with colleagues in various research disciplines.

# Log in

- **Home organization credentials**
  - eduGAIN
  - EU Login
- **Automated Access Policies**
  - 0 credits; view only (AP-A)
  - 100 credits; FSS, NBs (small) (AP-A1)
  - 500 credits (AP-B)

[Terms of Use](#) [Contact us](#) [Privacy Policy](#)

## European Open Science Cloud EU Node

Access your account and take advantage of the free resources, perform research and collaborate.

### Log in

Find your home institution

Search for your home institution and use your existing credentials to login

OR

If you have EU Login credentials, you may click on the link below



If you do not have an EU Login, you can click [HERE](#) and create one

# User Space

- **Your personal environment**
- Application Services
- Infrastructure Services
- Wallet (Credits)
- Orders
- Groups
- Favorites
- Notifications
- Settings

The screenshot displays the user interface for the EOSC EU Node. On the left is a sidebar menu with the following items: European Commission, EOSC EU Node, Resource Hub, Louise Evans user (with a Logout button), Overview (selected), Notifications, Tools Hub, SERVICES (File Sync & Share, Interactive Notebooks, Large File Transfer, Cloud Container Platform, Virtual Machines, Bulk Data Transfer), Other Services, GENERAL (Groups, Orders, Credits, Favourites). The main content area is titled 'Hello Louise Evans' and states 'This is the overview of your EOSC EU Node account.' Below this is a welcome message: 'Welcome to the closed beta of the EOSC EU Node!'. The 'Services' section is divided into six cards: File Sync & Share (Access enabled, View Service >), Interactive Notebooks (Access enabled, View Service >), Large File Transfer (Access enabled, View Service >), Virtual Machines (800 credits consumed in this period, Credits renewed 2024-12-14, View Service >), Cloud Container Platform (230 credits consumed in this period, View Service >), and Bulk Data Transfer (Access enabled, View Service >). The footer contains three columns: 'European Open Science Cloud - EU Node' (managed by the Directorate-General for Communications Networks, Content and Technology), 'Contact us' (Contact our Helpdesk, FAQs), and 'About us' (The European Open Science Cloud aims to establish a federation of infrastructures facilitating effortless access to interoperable).

European Commission

EOSC EU Node

Resource Hub

Louise Evans  
user

Logout

Overview

Notifications

Tools Hub

SERVICES

File Sync & Share

Interactive Notebooks

Large File Transfer

Cloud Container Platform

Virtual Machines

Bulk Data Transfer

Other Services

GENERAL

Groups

Orders

Credits

Favourites

## Hello Louise Evans

This is the overview of your EOSC EU Node account.

Welcome to the closed beta of the EOSC EU Node!

### Services

<b>File Sync &amp; Share</b> Access enabled <a href="#">View Service &gt;</a>	<b>Interactive Notebooks</b> Access enabled <a href="#">View Service &gt;</a>	<b>Large File Transfer</b> Access enabled <a href="#">View Service &gt;</a>
<b>Virtual Machines</b> 800 credits consumed in this period <a href="#">View Service &gt;</a> <small>Credits renewed 2024-12-14</small>	<b>Cloud Container Platform</b> 230 credits consumed in this period <a href="#">View Service &gt;</a>	<b>Bulk Data Transfer</b> Access enabled <a href="#">View Service &gt;</a>

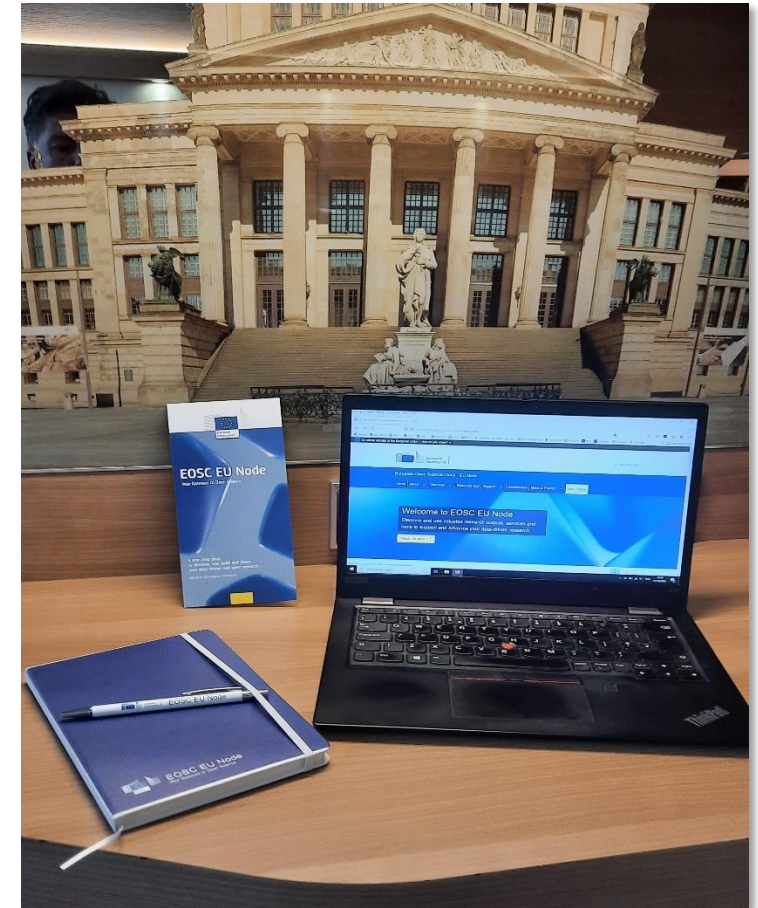
**European Open Science Cloud - EU Node**  
*This site is managed by the Directorate-General for Communications Networks, Content and Technology*

**Contact us**  
Contact our Helpdesk  
FAQs

**About us**  
*The European Open Science Cloud aims to establish a federation of infrastructures facilitating effortless access to interoperable*

# Uptake from users\*

- The EOSC EU Node has completed almost **5 months** in production
  - **~2K active users** and **12K visitors** (~20% better than our projections, steady growth)
    - Top-11 visitors from: SE, DE, ES, FR, USA, NL, GR, PL, BE, UK, CH
    - **114 users/hour** (peak)
  - Break-down of users per AP Level: **AP-A: 29%, AP-A1: 52%, AP-B: 18%** (stable)
  - **36K credits consumed** (12-14 weekly VM/OKD projects, 10% opt-in for EFSS)
  - Uptime **>99.5%**, scheduled downtime **<4 hours**, **no** security incidents, **~500** Helpdesk tickets
- A few interesting insights:
  - **Automated APs** and **credit** economy a **success** (fair, equitable, dependable, and transparent); we will (soon) **increase credits** to users
  - **Users still learning our offerings** (recipes, groups, collaboration, data/file transfer)
  - Re-occurring expressed **needs** (more resources/credits, serve non-ephemeral needs of projects & groups, offer software for others)



\* March 2025

# Thank you!