

Open Science practices and enablers – Status and Outlook

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European Commission, DG RTD, Unit A4 “Open Science & Research Infrastructures

*Integration of Research, Teaching and Innovation in a European University Campus
– Why, How and When*

*University of Maribor, ATHENA European University
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Open science - *modus operandi* of research

Open Science **facilitates sharing and collaboration**, thereby accelerating the discovery process, improving research quality, and making science more impactful and central to human and societal development. Embracing Open Science as the ***modus operandi of research*** requires improving the wide range of **practices** that comprise Open Science and developing its **enablers**.

Improving *the practice*

- **Early and open sharing of research**, ensuring verifiability and reproducibility
- **Providing immediate and unrestricted open access** to research outputs
- **Research output management** - publications, data, and other outputs - **in line with FAIR principles**
- **Public engagement in R&I**, e.g. citizen science

Developing *the enablers*

- **Incentives and rewards** to adopt open science practices, e.g. initiative for **Reforming Research Assessment**
- **Legislative and regulatory environment** for practicing open science (copyright, data and digital legislation)
- **Open research infrastructures and skills** e.g. **Open Research Europe (ORE)**
European Open Science Cloud (EOSC)



ERA policy agenda 2025-2027

European Research Area (ERA)

ERA structural policies 1-11

long-term ERA policies, which are not confined to individual policy agendas but still have a three-year workplan

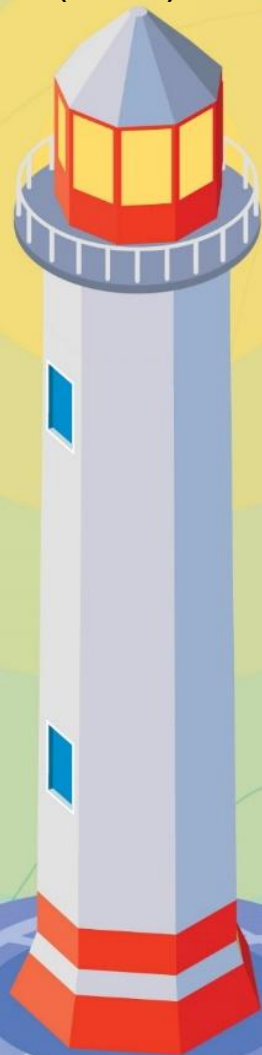
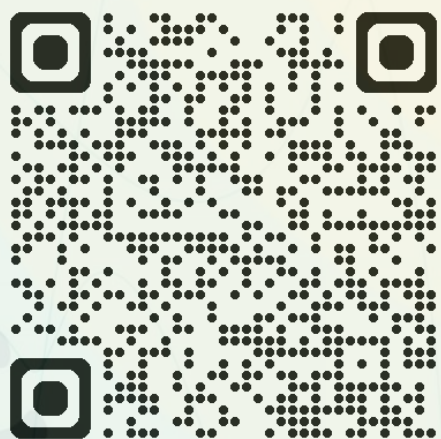
1. **Enabling open science**
2. Research infrastructures
3. Inclusive and intersectional gender equality
4. Making research careers more attractive and sustainable
5. **Reforming research assessment**
6. **Upscaling knowledge valorisation capacities and activities**

ERA actions 1-8

which are new and to be completed within the three-year policy agenda

1. **Equity in open science**
2. Advancing the European Science for Policy ecosystem
3. AI in science in the EU
4. Enhancing research security
5. Accelerating R&I investments for Europe's industrial transformation and competitive sustainability

7. Implementing the global approach to R&I
8. Strategic Energy Technology plan as a key thematic component of the ERA
9. **Improving the articulation between R&I and higher education within the ERA and unleashing the full potential of European R&I ecosystems**
10. **Enhancing trust in science** through citizen participation, engagement and science communication
11. Improving EU access to excellence
6. Accelerating new approach methodologies to advance biomedical research and testing of medicinal products and medical devices
7. A harmonised and coordinated framework for a European approach to integrity and ethics in R&I in the face of emerging challenges
8. A new era in research management



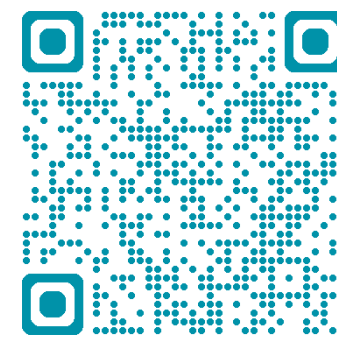
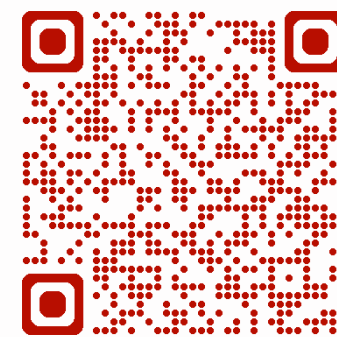
Open Science - ERA policy agenda

Structural policy #1

Enabling open science via sharing and re-use of data, including through the European Open Science Cloud (EOSC)

Expected outcomes

- Develop a **high-value EOSC Federation** and increase its uptake;
→ ***EOSC EU Node*** and ***EOSC Federation build-up phase***
- Increase the amount and productivity of FAIR research data in Europe;
- Identify areas for measures and initiatives to enable an **EU copyright and data framework fit for research**;
- Assess the impact of open science policies and practices based on an **open science policy intelligence platform**.
→ ***EOSC Open Science Observatory***
(to be launched: Resource Registry)



EU copyright and framework fit for research

Overarching objectives

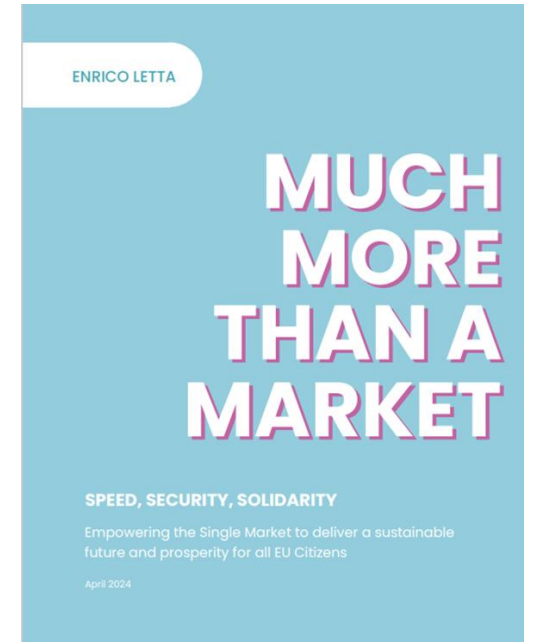
- EU Treaty article 179: Striving towards free circulation of scientific knowledge in the ERA
- Enrico Letta report on the Single Market:
Fifth freedom - Knowledge diffusion driving societal advancement
- EU copyright and digital legislation is key enabler of knowledge circulation

ERA Action 2 of the policy agenda 2022-2024

Propose a EU copyright and data legislative and regulatory framework fit for research

Outcomes:

- **Identify barriers and challenges** to access and reuse of publicly funded R&I results and of publications and data for scientific purposes, and identify potential impacts on research, [...].
- **Propose legislative and non-legislative measures** to improve the current EU copyright and data legislative and regulatory frameworks



EU copyright and framework fit for research

Major study

Objective: Providing comprehensive evidence on challenges, barriers and possible policy measures to improve access to and reuse of research results, publications and data for scientific purposes.

Methodology: Literature review and a comparative legal study, survey programme and interview programme followed by a multi-criteria analysis.

More information: The study was published in May 2024 and is [available on the Commission's website](#). The study is prepared for the European Commission, but it only reflects the views of the authors.

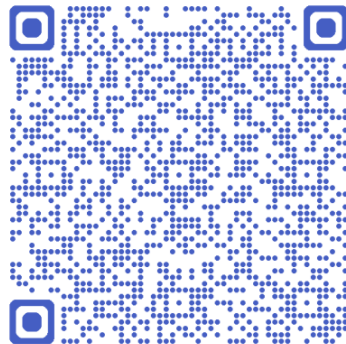
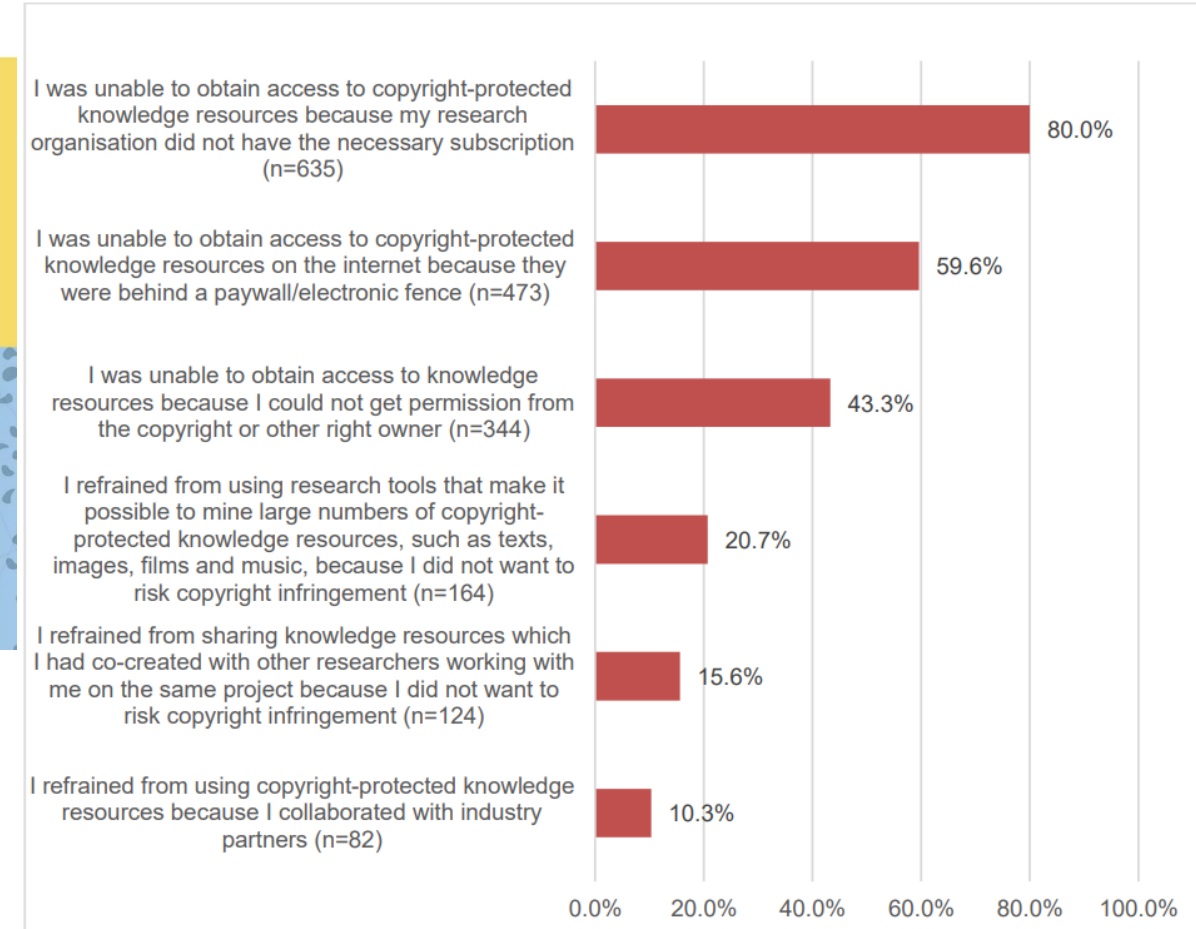


Figure 26. List of barriers for researchers to access and share copyright-protected material



Source: Compiled by the study team using data from the researchers survey, the question in the survey was Q18: "Overall, have you ever faced one of the following situations in your career?".

Some of the identified barriers

EU copyright and framework fit for research

Policy options in major study

The study highlights different policy options

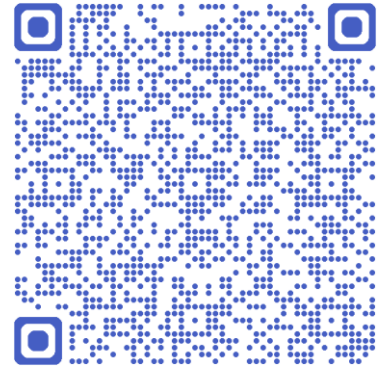
- on **secondary publication rights (SPR)**
- and **copyright and related rights (CRR)**

and elaborates on the interplay between

EU data and digital legislation (DDL) and research.

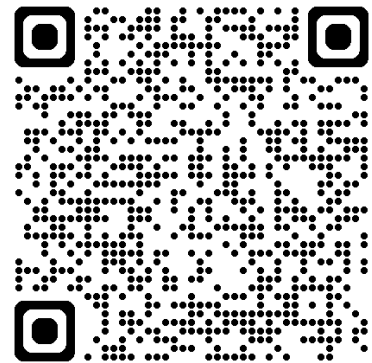
Ongoing economic analysis of identified policy options

- Request from ERA Forum to provide additional evidence on economic impact of SPR and CRR measures
- Purpose to analyse impact on:
 - open access and reuse of research output;
 - the ecosystem of scientific publishing;
 - competitiveness of EU/EEA and of non-EU G7 countries.



[News inc. full report](#)

[Executive summary](#)



Open Research Europe – Publishing platform

Platform for publications fully or partially funded by Horizon 2020 / Horizon Europe / other EU Framework Programmes

- Optional service at no cost to authors or their institutions (during and after the end of their projects)
- Automatic compliance with Horizon Europe Open Access requirements

Innovative publishing model

- Post-publication open peer review
- Articles and reviews in open access under CC BY licenses
- High scientific standards and policies:
Scientific Advisory Board; publisher policies and guidelines, including underlying data availability, analysis of method etc.
- Transparent service: in editorial process, in research process

Publishes in all disciplines and many different article types

- Researcher-led community gateways and collections in specific fields (=curated content by researchers)

Indexed in important indexers & national lists



ORE in numbers

Over...

1000
articles

5400
authors

1000
institutions

2500
reviewers

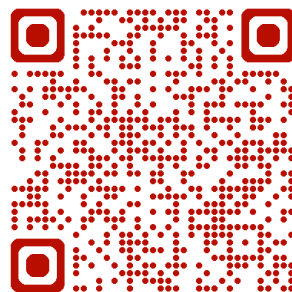
Open Research Europe – Publishing platform

A vision for Open Research Europe (ORE)

- A high-quality, trusted **OA publishing service** with **no author fees**
- **Collectively owned and supported** by research funders and research institutions **for the public good** (not-for-profit)
- Ultimately, ambition for a **publishing service available to all researchers** (no funding or origin eligibility criteria to publish)
- Supported by an **open-source infrastructure**

Next (major) steps and participation

- **Statement of Intent signed in January 2025**
- Collaboration agreement to fund ORE expected soon -
New members (**including institutional members**) always welcome to accede, including participation in governance and funding
- Launch of new collective ORE foreseen for ~Q3/2026



EOSC – Overarching objectives

EU Strategy for Data: EOSC is the basis for a science, research and innovation data space that will be connected and fully articulated with the sectoral data spaces.

Letta

Much more than a Market



“A central pillar of this strategy is the **creation of a European Knowledge Commons** – a centralised, digital platform providing access to publicly funded research, data sets, and educational resources. ...”

Draghi

The future of European competitiveness



“An important factor that would enhance R&I capacity is the availability of **world-leading research and technological infrastructure, capable of serving the whole European ecosystem**”

Heitor et al.

*Align, Act, Accelerate.
Research, technology and innovation to boost European competitiveness*



“The European Open Science Cloud (**EOSC**) is a **key enabler of the digitalisation of research infrastructures** while delivering the European Data Space for research data. **It has potential to become the most generally used infrastructure in Europe**”.

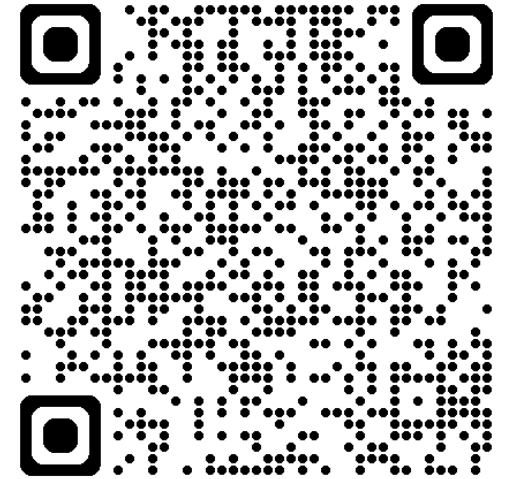
EOSC – Overarching objectives

(Upcoming) strategies with strong links to EOSC:

- **European Strategy on Research and Technology Infrastructures**
(adopted 15th September 2025)

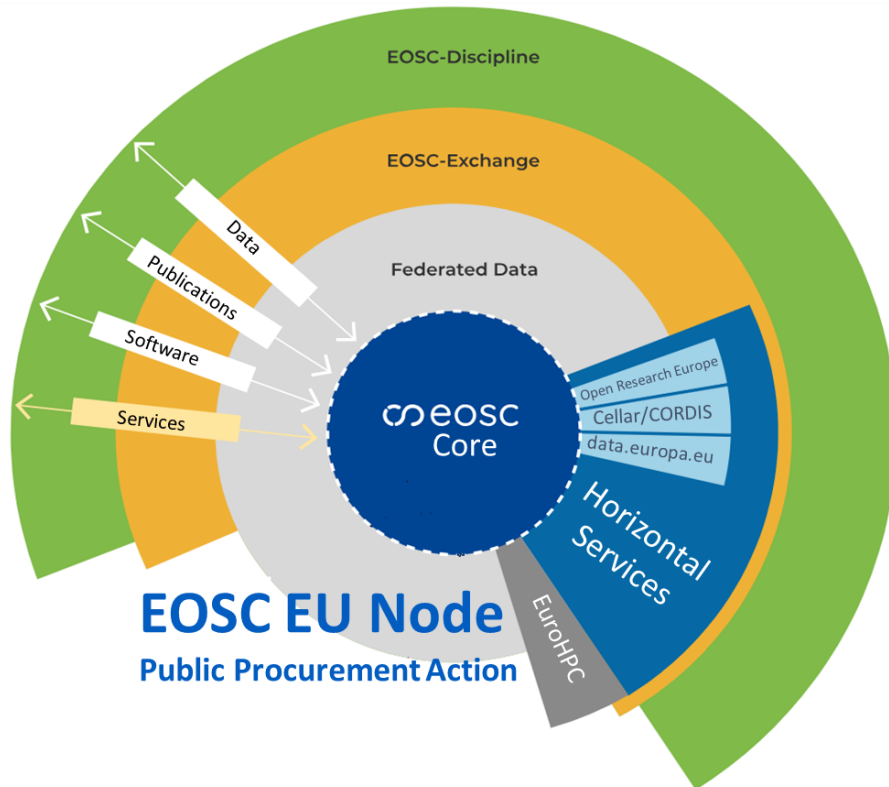
Actions:

9. Sustain and enhance **the EOSC Federation** as Europe's research and innovation data space, enabling sharing and reuse of high-quality, FAIR research data, scientific results and digital services.
 10. Support **compliance with FAIR principles**, increasing FAIR data productivity, and connections to EOSC and other relevant data spaces.
 11. Support the **pooling and development of AI-ready research data** as well as **tools and services that enable the development of scientific AI models**, and their technological applications, accelerating the use of AI in science and, through it, contributing to the pilot phase of **RAISE**.
- **AI in science strategy**
 - **Data Union strategy**



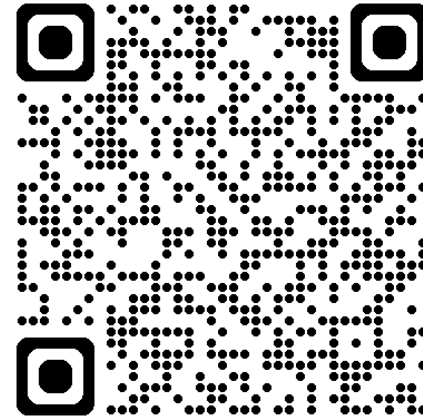
EOSC – the Federation (I), the EU Node

EOSC as an open and trusted **Federation of collaborative and autonomous infrastructures, a web of distributed **EOSC Nodes**, started with the **EOSC EU Node** provisioned from the European Commission:**



Can I use it? Yes, you can!
Launched at EOSC Symposium in Oct. 2024!

How can I use it? Go to:
<https://open-science-cloud.ec.europa.eu/>



EOSC – the Federation (I), the EU Node

The image shows a screenshot of the European Open Science Cloud (EOSC) EU Node website. The main navigation bar includes links for Home, About, Services, Resource Hub, Support, Contributors, News & Events, and User Space. A red box highlights the 'Log in' button in the top right corner. A blue arrow points from this box to a separate 'Log in' section on the right. This section contains a search box for home institutions, with 'Maribor' entered, and a list of results including 'ARNES' and 'University of Maribor'. Below the search box, there is a link for 'EU Login' and a note about clicking 'HERE' if the user does not have an EU Login. A yellow box labeled 'Helpdesk' is positioned over the 'Support' link in the navigation bar. A yellow box labeled 'Technology Forum' is positioned over the 'Contributors' link. The main content area is titled 'Resource hub' and features a search bar with 'SUSHI MSSM' entered. Below the search bar, there are tabs for 'All resources', 'Publications', 'Data', 'Software', 'Other Products', 'Services', 'Data Sources', 'Training', 'Interoperability Guidelines', and 'Tools'. The 'Publications' tab is selected, showing 'Showing 1 to 15 of 15 resources'. A list of filters on the left includes 'Access right', 'Scientific domain', 'Document type', 'Publication date', and 'Funder'. The search results show a publication titled 'SusHi: A program for the calculation of Higgs production in gluon fusion and bottom-quark annihilation in the Standard Model and the MSSM'. The publication details include the year (2012), views (0), downloads (0), and citations (290). The author list is H. Mantler, Robert V. Harlander, and Stefan Liebler. A green box labeled 'Available Services' is positioned over the 'Available Services' section on the right. This section lists various services offered by the EOSC EU Node, including File Sync and Share, Interactive Notebooks, Large File Transfer, Virtual Machines, Cloud Container Platform, and Bulk Data Transfer.

European Commission

European Open Science Cloud - EU Node

Home About Services Resource Hub Support Contributors News & Events User Space

Log in

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

Maribor

ARNES

University of Maribor

OR

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

EU Login

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

European Open Science Cloud - EU Node

Home About Services Resource Hub Support Contributors News & Events User Space

Available Services

The EOSC EU Node offers the following services:

File Sync and Share

Enable automatic file syncing and secure sharing across locations and teams.

Interactive Notebooks

Create and share documents with real-time code execution.

Large File Transfer

Streamline large file transfers online with added security and integrity.

Virtual Machines

Design and conduct experiments with flexibility while ensuring reproducibility.

Cloud Container Platform

Deploy cloud-native containerised applications that can easily scale.

Bulk Data Transfer

Move data effortlessly to data-intensive execution environments.

Resource hub

Publications

SUSHI MSSM

Showing 1 to 15 of 15 resources

Access right

Scientific domain

Document type

Publication date

Funder

No filters applied

Relevance

PUBLICATION

ARTICLE, OTHER LITERATURE TYPE, PREPRINT, JOURNAL

OPEN ACCESS

Year: 2012 | Views: 0 | Downloads: 0 | Citations: 290

SusHi: A program for the calculation of Higgs production in gluon fusion and bottom-quark annihilation in the Standard Model and the MSSM

This article describes the code **SusHi** (for "Supersymmetric Higgs") which calculates the cross sections $\sigma(pp \rightarrow H \rightarrow \gamma\gamma)$ in gluon fusion and bottom-quark annihilation in the SM and the **MSSM**, where H is any of the neutral Higgs bosons within these models. Apart from inclusive cross sections ...

Author H. Mantler | Robert V. Harlander | Stefan Liebler

EOSC – the Federation (I), the EU Node

Credits

Overview of your credits.

Your credits

90

Remaining credits

78 days

Next refresh

Services

File Sync & Share

10 credits consumed in this period

[View Service >](#)

Interactive Notebooks

Access enabled

[View Service >](#)

Virtual Machines

Not available
Please read our [User Access Policy](#) for more information

[View Service >](#)

Cloud Container Platform

Not available
Please read our [User Access Policy](#) for more information

[View Service >](#)

What are credits?

Credits are your virtual currency within the EOSC EU Node which you can spend to consume select services according to your needs.

Credits have no monetary value and are used exclusively in the EOSC EU Node to allow a fair, transparent, and equal access to its services across the entire European research community.

Credits are provided to you for **free of charge (at the point of use)** by the European Commission the first time you log in and are **automatically** renewed every three months. You can find all your spending history and remaining credits in your personal wallet. Please remember that you cannot transfer your credits to another person or between periods.

File Sync & Share

Enable automatic file syncing and secure sharing across locations and teams.

ownCloud infinite Scale can be accessed via a web browser, desktop app or mobile app. To find instructions on how to use these features, please refer to the [ownCloud](#) and [ownCloud Infinite Scale](#) documentation. You may also check out the [ownCloud Web for Users](#), the [Desktop App for Windows](#), [Linux](#), [Android](#), and the [Mobile App for iOS](#) documentation.

Note: The directory "notebooks_service" will automatically sync files to the Interactive Notebooks service. The "notebooks_service" directory will not be visible in the Interactive Notebooks service.

[Open in OwnCloud](#)

Personal

Shared with me

Root

Create folder

Upload file

	Name	Size	Owner
	notebooks_service	189.71 mb	Stefan LIEBLER

European Commission

EOSC EU Node
File Sync & Share Platform

Enter search term

All files

Personal

+ New

Upload

Shares

Spaces

Deleted files

Name ↓

notebooks_service

StatusSize

1 item with 198.9 MB in total (0 files, 1 folder)

EOSC Tripartite
Governance

EOSC
Federation
build-up group

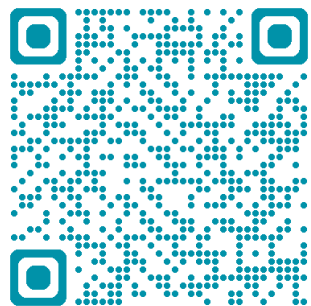
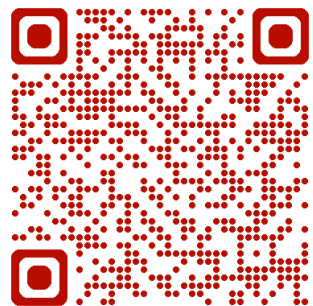
Following a dialogues process with 121 interested organisations interested to join the EOSC Federation, **13 organisations** were invited to a **kick-off workshop in Brussels in March 2025**, where they formed the **EOSC Federation build-up group**.

First deliverables:

EOSC AAI Architecture

EOSC Resource Catalogue

EOSC – the Federation (II)



EOSC – the Federation (III)

Participation in the EOSC Federation...

...of researchers

Researchers can already probe the offerings of the EOSC EU Node!

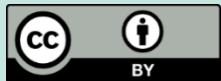
...of organisations

- Enrolment in the EOSC Federation as an EOSC Node, of national, thematic or e-infrastructure scope
→ Second wave of enrolment to be opened soon.
- Onboarding of resources to an existing EOSC Node as a third-party resource provider
→ Onboarding is supposed to remain a competence of the EOSC Node in charge.

Further use cases across the 13 EOSC Candidate Nodes shall be demonstrated at the EOSC Symposium in November 2025 in Brussels. Stay tuned!

EOSC is among others funded through Horizon Europe calls, recently with increasing focus on the EOSC Federation. You may pay attention to upcoming calls in Work Programmes (2025,) 2026 and 2027.

Thank you



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