LA SETTIMANA HORIZON EUROPE 2023

INFRASTRUTTURE DI RICERCA

Le novità del Work Programme Research Infrastructures 2023: la struttura, il contesto e le politiche

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OUTLINE

- Research Infrastructures in Horizon Europe
- European RI Policy
- WP 2023-2024
- Objective
- Key priorities
- Destinations
- Novelties
- Calls 2023
- Few considerations

RESEARCH INFRASTRUCTURES

European Research infrastructures are facilities that provide resources and services for the research communities to conduct top-level research and foster innovation in their fields.

A BROAD CONCEPT

- Great scientific equipment or set of instruments.
- Scientific collections, archives and structured information.
- Electronic infrastructures (e-infrastructures).
- Any other entity of a unique nature necessary for research.

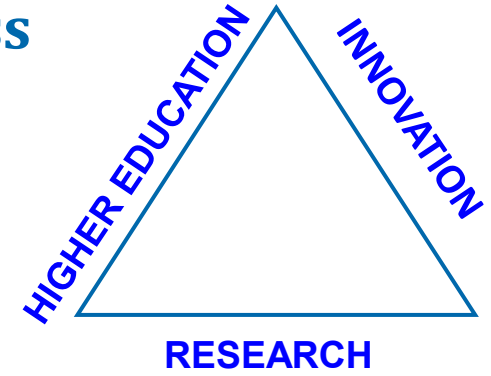
ACCESS

Physical, Remote, Virtual

CENTRALIZED, DISTRIBUTED OR VIRTUAL

RESEARCH INFRASTRUCTURES

- **One of the pillars of the European Research Area**
- **Essential for European researchers to remain at the forefront of R&I**
- **Key element for European competitiveness**
- **At the centre of the knowledge triangle**



- **MAIN CHALLENGES:**
  - Overcoming European fragmentation
  - Facing increasing costs and complexity
  - Improve the efficiency of services and access offered by the facilities
  - Develop the full potential of data and e-infrastructures

Why an EU approach to RIs?

Beginning of the XXI century

- National research infrastructures + few international organisations (e.g. CERN, European Southern Observatory, European Molecular Biology Laboratory) – **fragmented, un-coordinated landscape**

European Research Area (2000)

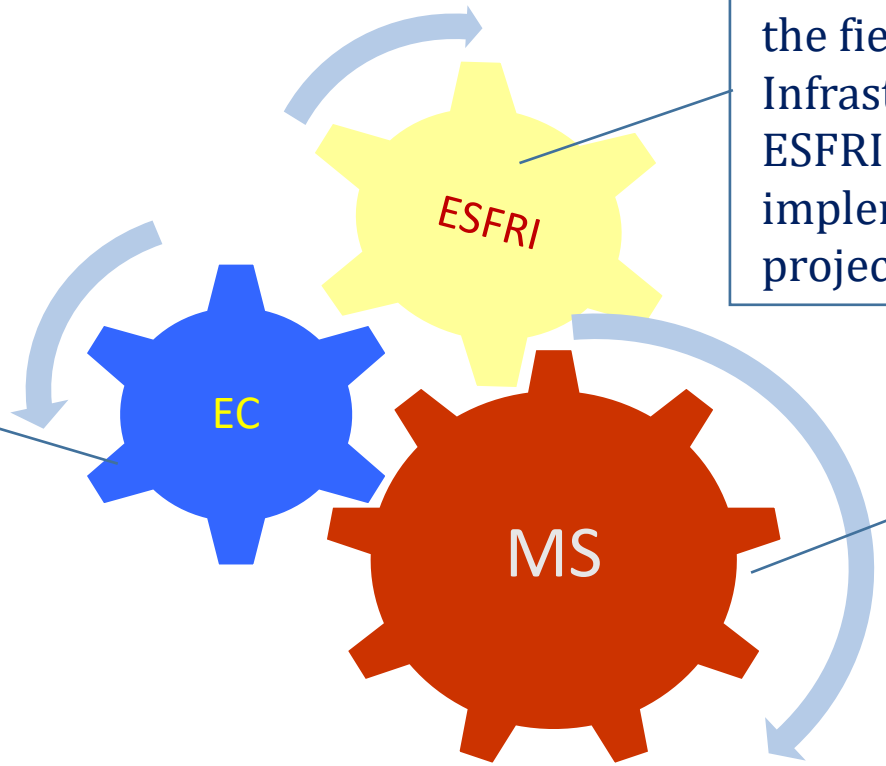
- A vision of a fully **developed, functioning and interconnected research space**, without barriers, where collaboration would flourish and a functional integration process would take place.
- **European RI policy**:
  - ✓ To help **pooling resources** so that the EU can acquire and operate research infrastructures at world level – RIs are becoming ever larger, **more complex and demanding to establish**, and more costly
  - ✓ To **open access** to the research infrastructures existing in the individual Member States to all European researchers – addressing **inequalities in access** to top facilities
  - ✓ To **coordinate and rationalise the development and use** of research infrastructures, avoiding duplication of effort – addressing a **fragmented landscape**
  - ✓ To **connect national research communities** and increase the overall quality of the research and innovation - fostering European **competitiveness** in research and innovation
  - ✓ To trigger the **exchange of best practice**, develop interoperability of facilities and resources, strengthening **connections between facilities** and building up **human resources capacity** and expertise

credit A. Robin, RTD.A.3.001

Actors in the definition of policies in RI

Support to the establishment of policies in the field of Research Infrastructures.
ESFRI helps to achieve the implementation of the projects of the "Roadmap".

Funds actions for implementation through European R&I Framework Programme.



Commitment of national resources for the construction and sustainability of Research Infrastructures.

Research Infrastructures in Horizon Europe

Pillar 1
Excellent Science

- European Research Council
- Marie Skłodowska-Curie Actions
- **Research Infrastructures EUR 2,4 bn**

Pillar 2
Global Challenges and European Industrial Competitiveness

Clusters
- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment

Joint Research Centre

Pillar 3
Innovative Europe

- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Widening Participation and Strengthening the European Research Area

- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system

ESFRI

ESFRI European Strategy Forum on Research Infrastructures

The European Strategy Forum on Research Infrastructures (ESFRI) was established in 2002 with a mandate from the Council of the European Union to:

- support a coherent and strategy-led approach to policy-making on research infrastructures in Europe
- facilitate multilateral initiatives leading to the better use and development of research infrastructures

ESFRI brings together representatives of Ministers of the 27 Member States, plus Associated States, and of the European Commission that are the decision makers and financers of the ESFRI Research Infrastructures

- indicates strategies for the necessary major financial investment (~20 b€) and long-term commitment for operation (~2 b€/year, +15% of current effort)
- upon mandate of Competitiveness Council of the European Union, ESFRI has completed the ESFRI ROADMAP 2021.

www.esfri.eu

ESFRI European Strategy Forum on Research Infrastructures

ESFRI Roadmap

1st ESFRI Roadmap cycle

- First Roadmap published in 2006, updated in 2008 and 2010, and contained **48 Projects** intended to foster European leadership across a broad range of scientific fields.
- Required **major financial investment** (~20 b€) and long- term commitment for operation (~2 b€/year)

2nd ESFRI Roadmap cycle

- **RI lifecycle concept** with minimal key requirements – comprehensive evaluation methodology
- ESFRI Roadmap 2016, 2018 and 2021: **Strategy report** + **Landscape Analysis** + **41 ESFRI Landmarks** + **22 ESFRI Projects** – strategic RIs for the future of ERA, RI investment agenda ~ 25 b€.
- Next ESFRI Roadmap update planned in 2025.

ERA Policy Agenda: Research Infrastructures

Deepening a truly functioning internal market for knowledge

Action 8 - Strengthen sustainability, accessibility and resilience of research infrastructures in the ERA

Set of foreseen activities

- **Strategic analysis** of the European Research Infrastructure **landscape**;
- Broader and more sustainable **access** for all countries to European research infrastructures and their services and revision of the European Charter of Access to Research Infrastructures;
- Update of the ESFRI **Roadmap** and implementation of the research infrastructures performance **monitoring** framework;
- Report on the **ERIC Framework**;
- Increased **cooperation** between research infrastructures, e-infrastructures and stakeholders, including through EOSC;

Research Infrastructures in Horizon Europe

Overall objective

Empower Europe through **an integrated ecosystem** of world-class and accessible national and pan-European RIs, which help covering the continuum of needs from **fundamental knowledge creation** to **technology deployment** and **support the implementation of Open Science policies** as well as European technology leadership.

Research Infrastructures Work Programme 2023-2024

Key priorities (1)

- Consolidate existing capacities and develop new RIs to support **scientific breakthroughs** and **respond to new challenges**, notably in the field of **health and for the twin transition;**
- Provide **ERA** with an effective and sustainable RIs landscape, which will make it **increasingly attractive for researchers and talents from all over the world**.
- **Upsurge resilience of RIs**, particularly in the context of recovery from COVID-19 pandemic and the energy crisis;
- Contribute to **Open science & data policies** through a trusted virtual environment (European Open Science Cloud - EOSC)
- Offer high-speed connectivity to researchers (GEANT).

Research Infrastructures Work Programme 2023-2024

Key priorities (2)

- Address **global environmental, social and economic challenges**, in line with the renewed ERA;
- Contribute to **local and regional development** by supporting, inter alia, the implementation of Smart Specialisation Strategies;
- Develop **cutting-edge technologies** for RIs **and foster innovation;**
- Reinforce the **international dimension** of European RIs.

Research Infrastructures Work Programme 2023-2024

Destinations

- **INFRADEV :** Developing, consolidating and optimising European RIs landscape, maintaining global leadership
- **INFRASERV :** RI services to support health research, accelerate the green and digital transformation, and advance frontier knowledge
- **INFRATECH :** Next generation of scientific instrumentation, tools and methods and advanced digital solutions
- **INFRAEOSC :** Enabling an operational, open and FAIR EOSC ecosystem
- **INFRANET :** Network connectivity - enabler for collaboration without boundaries

Research Infrastructures Work Programme 2023-2024

Main novelties

- Preparation of **common strategies** for future development of RIs technologies and services within broad RIs communities;
- **Co-Fund action for access;**
- **Greening** the research infrastructures technologies;
- **Advancing the challenge-driven** approach complementary to the bottom-up, excellence-driven approach.

Research Infrastructures Work Programme 2023-2024

In a nutshell

- **5 Destinations**: packages of actions contributing to specific objectives with expected impacts
- **7 calls:** 4 calls in 2023 (deadline: 09/03/2023), and 3 calls in 2024 (deadline: 12/03/2024)
- **27 topics**
- **Other actions**:
  - **5 grants for identified beneficiaries:** ERIC monitoring, EOSC monitoring, 2 presidency events, enhanced depositing services;
  - **1 SGA** to the FPA for Research and Education Networks;
  - **External expertise**: reviewers; individual experts; ERICs evaluators.

~654 M€ total budget: ~320 M€on topics/actions 2023, ~334 M€on topics/actions 2024

INFRADEV 2023

HORIZON-INFRA-2023-DEV-01-01:
Concept development for a research infrastructure to manage, integrate and sustain large medical cohorts
HORIZON-INFRA-2023-DEV-01-02:
Early phase implementation of ESFRI Projects which entered the ESFRI Roadmap in 2018
HORIZON-INFRA-2023-DEV-01-03:
Consolidation of the RI landscape – Individual support for evolution and long-term sustainability of pan-European research infrastructures
HORIZON-INFRA-2023-DEV-01-04:
Consolidation of the RI landscape – development of complementarities, synergies and/or integration between a set of pan-European RIs
HORIZON-INFRA-2023-DEV-01-05:
Preparation of common strategies for future developnet of RI technologies and services within broad RI communities
HORIZON-INFRA-2023-DEV-01-06:
Strengthen the bilateral cooperation on research infrastructures with Latin America
HORIZON-INFRA-2023-DEV-01-07:
Strengthening the international dimension of ESFRI and/or ERIC research infrastructures
HORIZON-INFRA-2023-DEV-01-08:
Preparatory phase of new ESFRI research infrastructure projects

INFRASERV 2023

HORIZON-INFRA-2023-SERV-01-01:

Research infrastructure services to enable R&I addressing main challenges and EU priorities

- ***RI services to enable research linking environmental factors to human health***
- ***RI services for improving clinical research in the paediatric area***
- ***RI services for climate-change risks***
- ***RI services for sustainable Arctic/polar regions***
- ***RI services for healthy ocean and waters***
- ***RI services for sustainable aquaculture, fisheries and blue economy***
- ***RI services for renewable energy technologies and systems***
- ***RI services for innovative applications of nanoscience and nanotechnology***
- ***RI services to enhance the EU capacity for the development of semiconductors***
- ***RI services for shaping the future generation society***

HORIZON-INFRA-2023-SERV-01-02:

Research infrastructure services advancing frontier knowledge (Biosphere; Astronomy& Astroparticlephysics; Arts&Humanities)

HORIZON-INFRA-2023-SERV-01-03:

Research infrastructure services advancing frontier knowledge: co-fund pilots with pan- European RIs and/or national RIs

Co-fund pilots

- **Funding rate: 70%** of the eligible costs. Proposals must explain how the EU funding will be complemented by other national or international funding sources ;
- Access programme to RIs may be implemented either directly by the consortium, with the provision of trans-national / virtual access by beneficiaries, third parties or external providers of purchased services, or through the mechanism of "financial support to third parties" (*cascade granting*);
- national or international access programme managers, including the legal entities of distributed European RI, are expected to be core partners in the consortia;
- Proposals should include the list of services/installations made available by the action for trans- national or virtual access and the estimated amounts of units of access made available for users.
- In case of financial support to third parties:
  - ✓ Description of the different types of research infrastructure services, (and ~ quantity of access), that are made available for trans-national or virtual access by the co-funded calls, including a list of examples of existing installations (e.g. those from beneficiaries/affiliated entities);
  - ✓ applicants to access calls: users together with the research infrastructures they need, including nodes of distributed ESFRI or ERIC infrastructures;
  - ✓ if beneficiaries/affiliated entities are recipients of the financial support, proposals must explain how they will ensure that these entities are not involved in the selection procedure of the calls, in order to avoid conflicts of interest and maintain confidentiality.

INFRATECH 2023

HORIZON-INFRA-2023-TECH-01:

New technologies and solutions for reducing the environmental and climate footprint of RIs

Context: European Green Deal priorities as well as issue of rising energy prices

Expected Outcomes:

- reduction of environmental (including climate-related) impacts;
- optimisation of resource and energy consumption integrated through the full life cycle of research infrastructures;
- increased long-term sustainability of European research infrastructures.

Scope:

- delivering innovative technologies and solutions which reduce the environmental and climate footprint of RIs through the full life cycle of research infrastructures
- identifying common methodologies, among the concerned RIs, to assess environmental impact and strategies to reduce it
- R&I activities, including technology validation and prototyping
- training of RI staff for the operation and use of new solutions
- At least 3 world-class RIs: ESFRI RIs, ERICs and/or other world-class Research Infrastructures of European interest

INFRAEOSC 2023

HORIZON-INFRA-2023-EOSC-01-01:
Build on the science cluster approach to ensure the uptake of EOSC by research infrastructures and research communities

HORIZON-INFRA-2023-EOSC-01-02:
Development of community-based approaches for ensuring and improving the quality of scientific software and code

HORIZON-INFRA-2023-EOSC-01-03:
Planning, tracking, and assessing scientific knowledge production

HORIZON-INFRA-2023-EOSC-01-04:
Next generation services for operational and sustainable EOSC Core Infrastructure

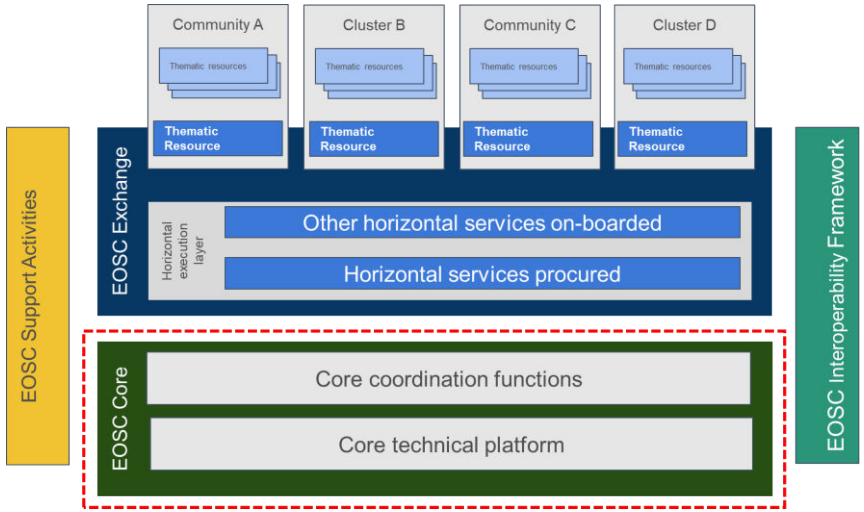
HORIZON-INFRA-2023-EOSC-01-05:
EOSC Architecture and Interoperability Framework

HORIZON-INFRA-2023-EOSC-01-06:
Trusted environments for sensitive data management in EOSC

Next generation services for operational and sustainable EOSC Core Infrastructure

Context:

- Data-driven user experience as a fundamental aspect for further development of the EOSC Core, allowing user feedback for the continuous improvement of the EOSC platform's functionality in an open manner.



EOSC Architecture and Interoperability Framework

Context:

- The EOSC Architecture and Interoperability Framework coordination and governance seeks to ensure that interoperability is built, encouraged and maintained with structure, fairness and transparency.

Research Infrastructures in Horizon Europe

MISSIONS, PARTNERSHIPS

Summary

- Research Infrastructures are very important in ERA
- RIs in Horizon Europe
- WP RIs 2023-2024
- RIs role in Clusters in Pillar 2, Missions and Partnerships