



SPECTRUM: towards a Computing Strategy for Data-intensive Science Infrastructures in Europe

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Outline

- **Project Overview**
- **Main Expected Results**
- **Timeline**
- **Current outputs**
- **What's Next**



Project Vision and Overall Objective

VISION

Data-intensive scientific collaborations have access to a European exabyte-scale research data federation and compute continuum

PROJECT OVERALL OBJECTIVE

*Deliver a **Strategic Research, Innovation and Deployment Agenda (SRIDA)** which defines the vision, overall goals, main technical and non-technical priorities, investment areas and a research, innovation and deployment roadmap for data-intensive science and infrastructures*

Key Data

Fact sheet: [See page on CORDIS](#)

Duration: 30 months – **Start date:** 1 Jan 2024 – **End date:** 30 June 2026

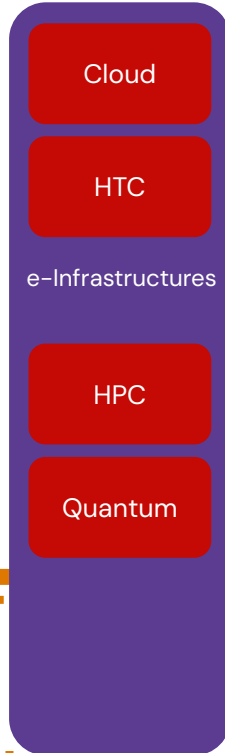
Partners: 9 partners + 1 affiliated

Budget: 2,449,542.50€

Funding Source: Horizon Europe – Call [HORIZON-INFRA-2023-DEV-01-05](#)

- *Preparation of common strategies for future development of RI technologies and services within broad RI communities*

Consortium Overview



SPECTRUM
project



Community
of
Practice



Main Expected Results

Community of Practice (CoP)

- Cross-disciplines WGs with experts from HEP, RA and digital infras
- Knowledge Base
- Collaboration platform

Compendium of Use Cases

- From science case to technical challenges, requirements, gaps
- Both technical and policy aspects

Landscape analysis

- Existing approaches, services, technical solutions and policies for the federation of data and compute infrastructures

Access Policies Recommendations

- Existing access policies across the continuum
- Development of recommendation for Interoperable access

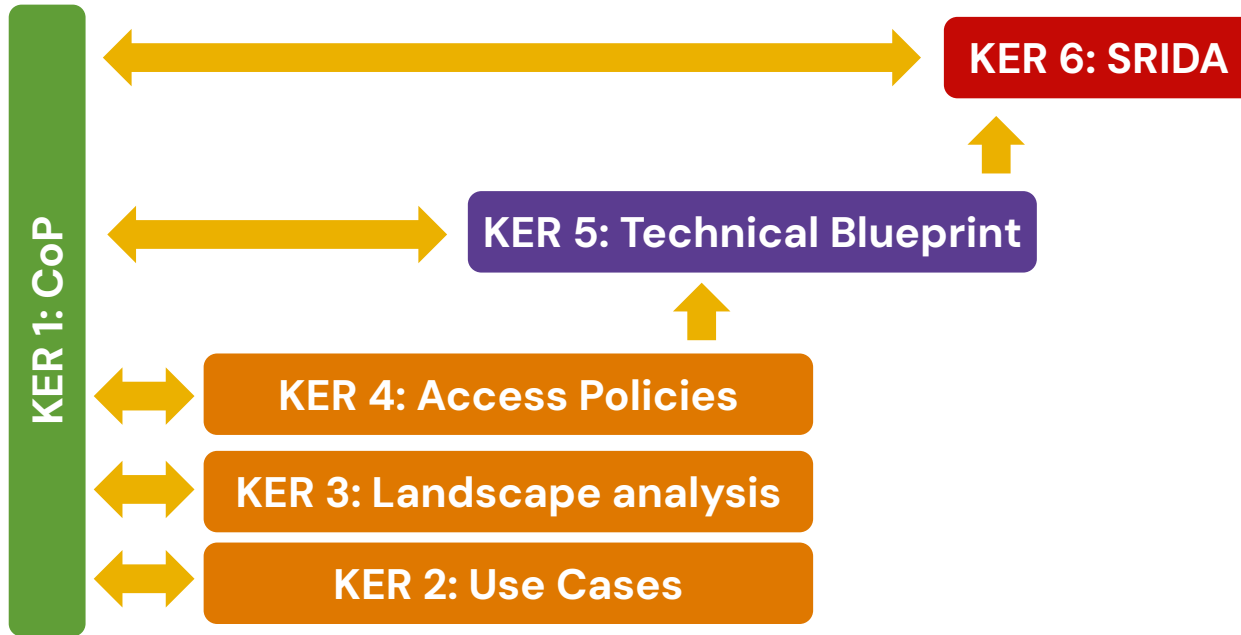
Technical Blueprint for Compute & Data Continuum

- Proposal for a compute-and-data trans-continuum infrastructure design and architecture

SRIDA

- Vision and overall goals
- Research, innovation and deployment roadmap
- For data-intensive science and infras in HEP & RA

Relationship among Results



Primary Target Groups

TG1 – Scientific Communities / Research Infrastructures

Scientific Communities in HEP and RA and other relevant domains.

Participate in CoP and WGs, Implement outputs

TG2 – Computing & Data Service Providers/e-Infrastructures

Existing Data, HPC, HTC, Cloud, Quantum

Participate in CoP and WGs. Implement outputs

TG3 – Policy Makers / Funding Bodies

European Commission, EuroHPC, EOSC,
National Authorities, ESFRI...

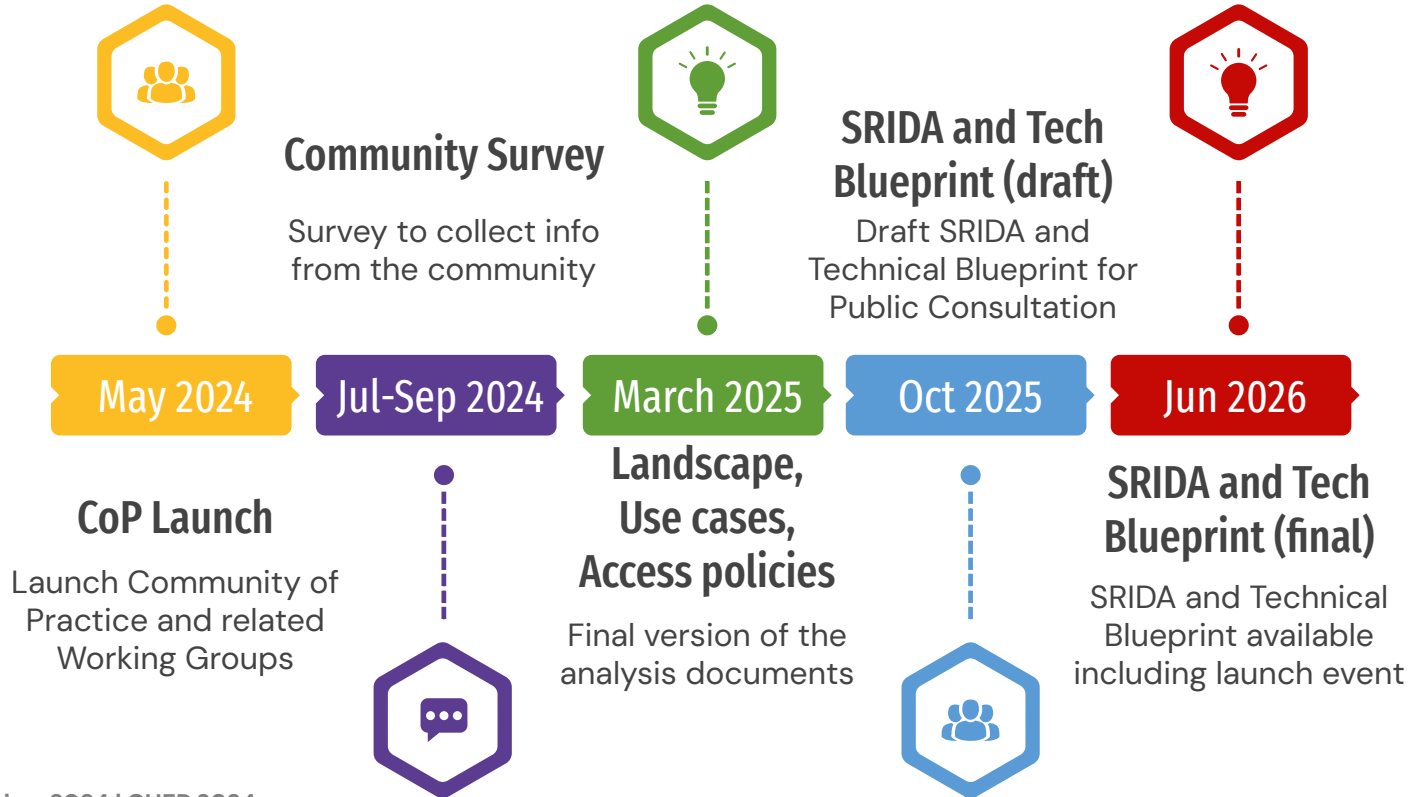
Provide inputs, align policies

TG4 – ‘Long Tail of Researchers’

Inputs to use cases through represented communities



Timeline





Collaboration with other initiatives

JENA initiatives

- Comes from the 3 main committees for HEP, Nuclear Physics and Astroparticle Physics (Joint ECFA-NuPECC-APPEC)
- Workshop in 2023 and launch of working groups after SPECTRUM was submitted
 - Timescale similar to ours
 - WG leaders in JENA are already members of SPECTRUM WGs.

JENA Working groups:

WG1: HPC

WG2: Software

WG3: Data

WG4: AI

WG5: Training, Dissemination, Education

The Upgrade o the European Strategy for Particle Physics

- Happens every 5-10 years
- It was scheduled in 2026, moved 1 y earlier
- Will receive contributions/inputs from the community by March 2025
 - Same time scale as SPECTRUM, and also a target for JENA



Current Outputs

SPECTRUMCoP: List of WGs

WG1: Data Management and Access

Chair: BAGNASCO Stefano (INFN, ET, Virgo)

- Data Management
- Data Access Protocols
- Data Archiving
- Security

WG2: Workflow management and organization

Chair: DELL'AGNELLO Luca (INFN CNAF-T1)

- Resource Discovery and Workflow Submission
- Resource Allocation
- Complex Workflows

WG3: Compute Environment

Chair: BOZZI Concezio (INFN, LHCb, JENA-HPC)

- Expected Tools and Services
- Facility Expectations
- Edge Services
- Library Provisioning

WG4: SW tools

Chair: SWINBANK John (Astron)

- Machine Learning Frameworks
- Multithreading Frameworks
- Multi-Node Tools
- Compilers, toolchains, ...
- Quantum computing tools and frameworks
- Code Management Practices

WG5: Scientific Use cases

Chairs: FERRARI Chiara (CNRS, OCA), GIRONE Maria (CERN)

- Typical Use Cases
- Requirements and Needs
- Best Practices Collection
- Data Fluxes and Paths

WG6: Facilities

Chair: HOPPE Hans-Christian (Jülich)

- HPC Centers
- Access to Quantum Computing Hardware
- Access to Commercial and Public Clouds
- Sustainability
- Security

A total of 75 participants, from ~50 unique individuals

More information: <https://www.spectrumproject.eu/spectrumcop>

SPECTRUMCoP: The survey!

Conditional survey, which adapts according to what you fill in at the beginning:

- Present yourself
- Your Role in computing

Depending on your area of expertise, topics may include:

Authentication and Authorization

Processing Needs

Data Management Needs

Training and careers

Expected Computing Environment

Use cases

Software development, distribution, policies

LINK:

https://ec.europa.eu/eusurvey/runner/SPECTRUM-JENA_Survey1



The survey is still open, so you are still on time to fill it!

No. of Replies (so far) by area

Which are the categories which better describe your role(s)?	Answers	Fraction (%)
Experimental High Energy Physics (HEP)	30	29.7%
Experimental Gravitational Waves (GW)	6	5.9%
Observational Astroparticle (not RA or GW)	9	8.9%
Observational Radio Astronomy (RA)	8	7.9%
Theoretical High Energy Physics (HEP)	15	14.9%
Other physics related domains (please specify below)	6	5.9%
Other non-physics related research domains (please specify below)	4	4.0%
Experimental Nuclear Physics (NP)	9	8.9%
Theoretical Nuclear Physics (NP)	12	11.9%
Theoretical Gravitational Waves (GW)	2	2.0%
Total	101	100%

Use Case Analysis: The Template

- **Goal:** Identifying current and future requirements of HEP and RA communities
- Template “co-design” with the survey and “internal” use-cases (from CERN/LHC and RA) as initial examples
- Selection of use cases and experts in progress

Structure for each identified use-case:

Scientific challenge

Storage

Data transport

Compute

Workflow management

Access and analysis

Gap analysis

Non-technical challenges

What's Next -> Coming in March 2025

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- Luciano Gaido



- Jean-Pierre Vilotte



- John Swinbank
- Hanno Holties



- Chiara Ferrari



- Corentin Lefevre
- Valentin Jay Blanchard

How can you contribute?

Join the CoP

https://www.spectrumproject.eu/spectrum_cop

Follow us on LinkedIn

<https://www.linkedin.com/company/spectrum-project-eu>

Fill the Survey

https://ec.europa.eu/eusurvey/runner/SPECTRUM-JENA_Survey1

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Thank you! Questions?

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