

A European Strategy for AI in science – paving the way for a European AI research council

Public Consultation and Feedback June 2025

Joint feedback from:

- CERN (European Organization for Nuclear Research)
- EMBL (European Molecular Biology Laboratory)
- ESO (European Organisation for Astronomical Research in the Southern Hemisphere)
- ILL (Institut Laue-Langevin)

Artificial Intelligence (AI) for science is the interdisciplinary suite of algorithms, models and data-driven methodologies that empower computers with the ability to generate hypotheses, design or conduct experiments, analyse complex data, and predict natural phenomena with minimal human intervention, thereby accelerating, amplifying and sharpening scientific discoveries. AI is transforming and expanding the frontiers of science and technology. In recent years, a deep learning revolution leveraged advances in high-efficiency computing to solve complex tasks like computer vision, time series analysis, and natural language processing. Today new Generative AI applications have demonstrated the potential for future breakthroughs across various scientific fields, from particle physics searches to protein interaction prediction. They have also rapidly grown into an integral part of everyday life applications through innovations like autonomous vehicles, personalised medicine, chatbots and virtual assistants.

An ambitious vision and strategy for keeping Europe at the forefront of AI development and adoption across areas of scientific, industrial and societal impact is paramount to foster competitiveness, nurture innovation, preserve sovereignty and create opportunities for present and future generations of researchers, professionals, and citizens. This must be achieved without sacrificing the values of fairness, openness, inclusivity, personal safety and privacy that Europe has so far strongly promoted and enforced.

It is important in this context to ensure that research in AI technologies and its efficient application in fundamental and applied sciences go hand in hand with developments in industry and society and that they complement and reinforce each other through virtuous cycles of invention, innovation, translation to applications and products, and thus new requirements and needs for more innovation. The need to address scientific challenges and solve scientific problems has traditionally led to the developments of cutting-edge solutions. The same can and must happen for AI by integrating a continuous interaction between science, industry and societal stakeholders in the AI strategy for Europe.

CERN, EMBL, ESO and ILL have extensive expertise in the areas of fundamental research and the management of large international infrastructures and research programmes in the fields of particle and nuclear physics, molecular biology, ground-based astronomy and advanced material science. The paradigm of a “CERN for AI” has been used in recent times as a possible model to structure and execute a broad and shared European vision for AI. The combined

expertise, organisational and governance models, interdisciplinary networks and aggregation capabilities of the European intergovernmental research organisations (EIROs) would be a solid foundation on which such a shared vision for AI and, in particular, AI for Science could be built on.

Given the variety, diversity and richness of the different communities represented by the EIROs, and building on the European Commission's new proposal for a Resource for AI Science in Europe (RAISE)¹ we believe that an effective governance model could be structured around a high-level AI Research Council, responsible for setting a global vision and strategic directions, as well as defining, supporting, and overseeing the implementation and adoption of the AI in Science Strategy. The Council should be complemented by a limited set of Centres of Excellence, some of which could be hosted in (a number of) large European research organisations representing large scientific communities. These Centres would be tasked with structuring collaboratively an ambitious, yet focused research programme and an accompanying set of services and training mechanisms, working closely with research or thematic consortia such as CAIRNE², ELLIS³, or EuCAIF⁴.

The programme would establish a common foundation for all disciplines, including ethical and legal stewardship of AI in science aligned with emerging frameworks such as the EU AI Act, then assess whether AI is the optimal approach for a particular scientific question, and finally develop best-of-breed applications tailored to the specific needs of each domain.

Such an approach would bring about several strategic opportunities:

1. An Interdisciplinary, Structured, Shared Research Mission

The European intergovernmental research organisations, either directly or through their respective communities, have traditionally used AI/Machine Learning (ML) techniques in their work for many years, leading to many successful outcomes. The collective expertise and the convening power of such organisations place them in a unique position to focus the strategy while broadening the scope. By coordinating the many existing and emerging, local initiatives across different communities and institutes, they can help foster interdisciplinary alignment, promote wide dissemination and build consensus across an extensive scientific ecosystem.

- 2. Global AI Collaboration:** The international model of European research organisations (the “CERN for AI”) already brings together top scientists, institutions, and governments to advance AI research in a transparent and collaborative manner. Building on this foundation, a federated model of high-level Centres of Excellence would rapidly bring this successful model of collaboration to the full European scale, leveraging existing competencies and relationships, as well as fostering international collaboration beyond European boundaries.
- 3. Ethical AI and Open Science:** The EIROs are leaders in open science and in promoting fair access to data and resources. A pan-European AI Research Council, prioritizing ethical AI development, ensuring that research remains transparent, publicly beneficial, and aligned with European values, would strongly benefit from the existing expertise, tools and vision from the European intergovernmental research organisations. Their long-established

¹ [Commission seeks feedback on the future Strategy for Artificial Intelligence in Science](#)

² [Confederation of Laboratories for Artificial Intelligence Research in Europe](#) (CAIRNE)

³ [European Laboratory for Learning and Intelligent Systems](#) (ELLIS)

⁴ [European coalition on AI for Fundamental Physics](#) (EuCAIF)

culture to embrace Open Science, Open Access and Open Data, along with their ability to develop efficient tools, position them as key enablers to support and enforce such a vision.

4. **Fair and Sustainable Access to Resources:** AI development and adoption require resource infrastructure on a scale far beyond what has been deployed so far. This raises several critical considerations around fair access to resources and sustainability. AI (Giga) Factories are an excellent model to cluster resources in strategic areas, both geographically and by discipline. It is important that such resources are used efficiently and fairly and that access for scientific research is built into the model from the outset, taking into account the international and transnational nature of scientific research. The EIROs can provide a mechanism, in collaboration with entities such as EOSC⁵ or EuroHPC⁶, to ensure that resources are fairly allocated to researchers across disciplines and that the outcome of the research is broadly shared and disseminated. Sustainable use of resources is a primary concern for the organisations, which can collectively contribute to raise awareness to the issue and promote the development of efficient AI models across their communities of reference. Appropriate funding or reserved allocation for scientific research must be integrated in future programmes and in the AI Factories concept to ensure that the Factories are easily accessible to research teams, both from a technical and financial point of view.

5. **Education, Training and Talent Development**

Developing and sharing knowledge and skills in AI technologies must be a critical part of the AI Strategy and significant investments in education and training programmes must be envisaged. The EIROs have a long tradition and strong track record of collaborating with academia and industry to establish summer schools, exchange programmes, internships, hackathons and many other initiatives for long-term human capacity development. They would offer an already rich platform to nurture future European talent growth and competitiveness across multiple, critical disciplines. The skills developed through these programmes would be beneficial for scientific research and facilitate talent mobility from science to industry, while contributing to developing the AI talent that is currently in high demand across both sectors.

In conclusion, by strategically positioning the European intergovernmental research organisations and their underlying research and user communities in the AI in Science strategy, and with appropriate investments, these organisations can play a pivotal role in shaping Europe's AI future. A model composed of a European AI Research Council and a federation of Centres, possibly co-located within existing organisations, and exploiting the resources provided by the AI Factories, offers a compelling path forward. This approach leverages Europe's existing strengths and competencies while ensuring that AI development remains aligned with ethical, open, and scientific principles and is efficiently translated into sovereign, competitive applications for science, industry and society.

⁵ [European Open Science Cloud \(EOSC\)](#)

⁶ [The European High Performance Computing Joint Undertaking \(EuroHPC JU\)](#)