



**GENCI**



**EuroHPC**  
Joint Undertaking

# Alice Recoque and AI Factory France beyond Exascale, toward the convergence of HPC, AI and Quantum





# GENCI, A FRENCH HPC RESEARCH INFRASTRUCTURE

Serving yearly > 2200 research projects in HPC and AI (academia, industry)



EuroHPC  
Joint Undertaking



## TGCC/CEA - Ile de France

- Hosting Site for the **2<sup>nd</sup> Exascale system (EuroHPC)** called Alice Recoque within the Jules Verne consortium (FR, NL, GR)
- Hosting Site for the **1<sup>st</sup> hybrid HPC + Quantum computing infrastructure** (HQI, HPCQS, EuroQCS-France)



## IDRIS/CNRS - Ile de France

- **1<sup>st</sup> converged HPC/AI system (#AIForHumanity)**
- Bring **sovereign** computing facilities / services to AI research community
- **> 3800 NVIDIA GPUs in 2025**

France  
Universités



## CINES/FU - Montpellier

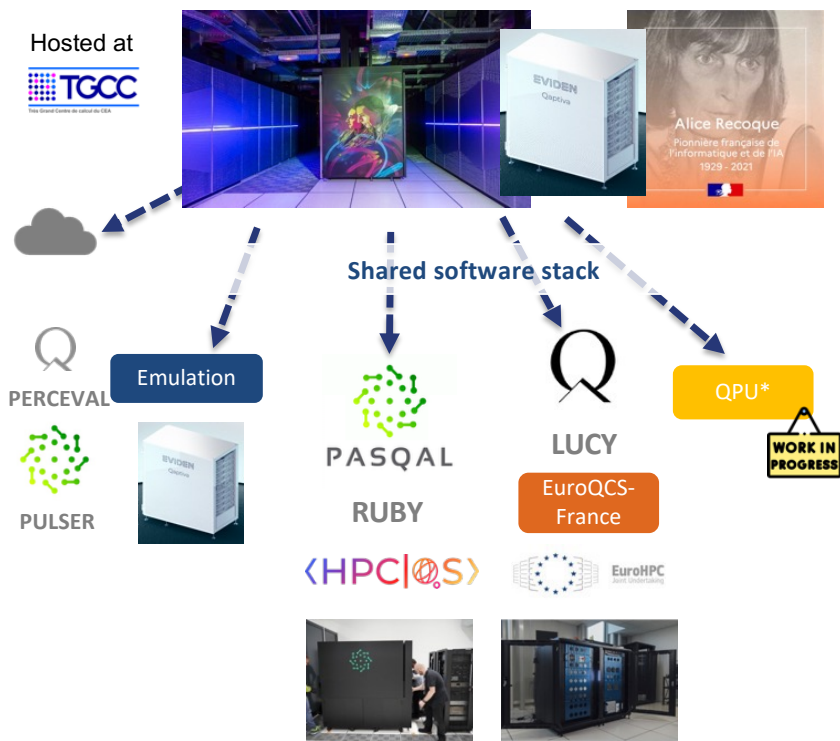
- **> 90 PF** with AMD next gen GPUs (>1500) & CPUs (>100k)
- **Used for HPC and AI**

**>1400 AI projects in 2024**  
3 keys of success -> GPUs, **user support** and access modes

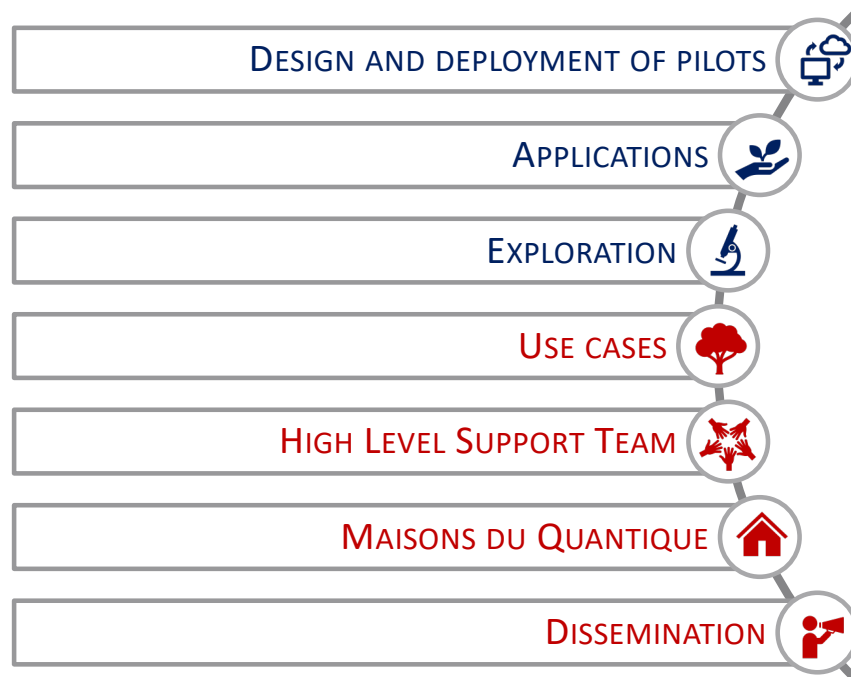
## FRANCE HYBRID HPC-QUANTUM INITIATIVE

Part of the French National Quantum Strategy

A NATIONAL HYBRID HPC-QUANTUM INFRASTRUCTURE...



... SUPPORTED BY A BROAD R&D AND SUPPORT PROGRAM



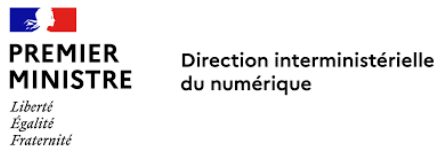


# SERVING AI NEEDS IN ACADEMIA, INDUSTRY & PUBLIC SERVICES

From a wide range of organisations



+ many engineering schools





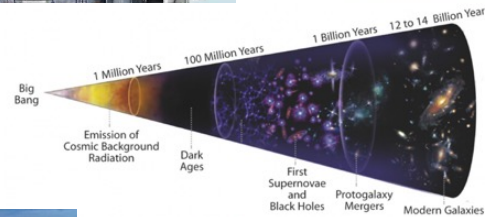
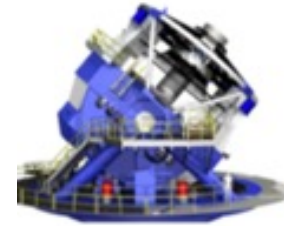
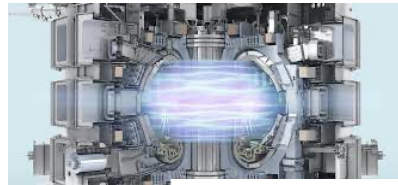
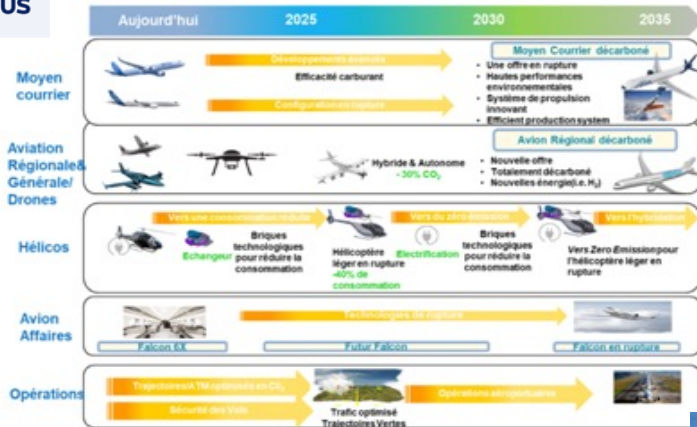


# EXASCALE SERVING HPC NEEDS IN SCIENCE AND INDUSTRY

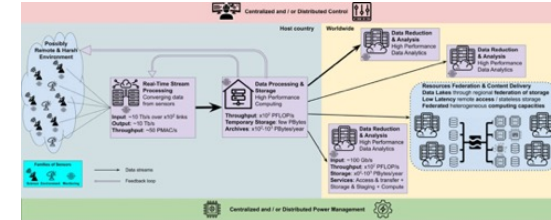
A major stake for European research and innovation

AIRBUS

Vision programmes aéronautiques de la filière

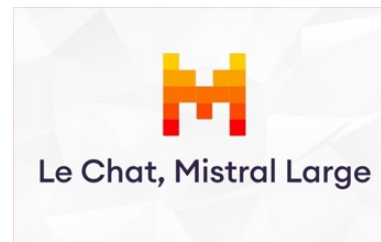
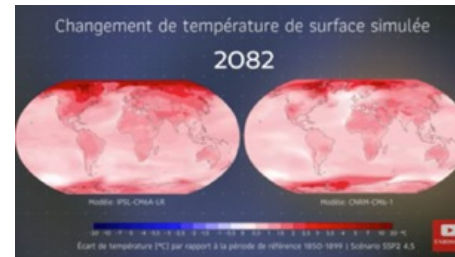
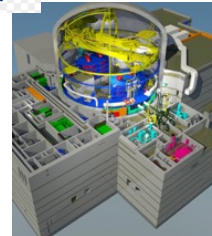
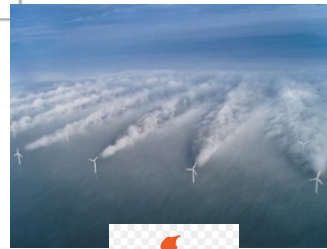


SKAO



SAFRAN

Simulations at Safran – On the road to mastering high-fidelity models





# JULES VERNE : THE FRENCH LED (POST) EXASCALE CONSORTIUM

## Organization of the french application

- GENCI *Hosting Entity*
- CEA *Hosting Site*
- SURF (NL) as member of consortium
- GRNET (GR) as member of the consortium



Name of the consortium : Jules Verne

Name of the supercomputer : Alice Recoque

Full TCO over 5 years : 554 M€ (50% EuroHPC, 50% consortium)

- French public contribution (MESR, France2030...)
- French research institutions (ONERA and IFPEN)
- French Industrial partners (ongoing)
- NL and GR contribution, **other countries (ongoing discussions) + AI Antennas**



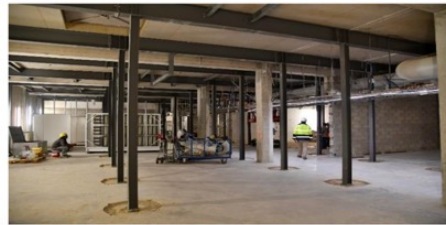


# ALICE RECOQUE

## Exascale impact on infrastructure @ CEA-TGCC

### Slab reinforcement (2.8T/m<sup>2</sup>)

- Adaptation work finished in Q4 2024
  - 67 micro piles drilled below the facility (18m depth)
  - Steel structure on top of the micro piles

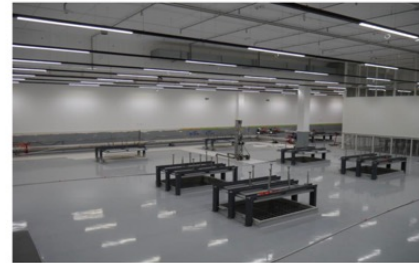


CEA Hosting Entity meeting



### IT rooms preparation

- Main rooms ready since Q3 2024
  - Dismantling of Joliot-Curie phase 1 system required to finish : Q2 2026
  - Remaining work handed over to the Supplier of the Alice Recoque system
    - Strengthened floor tiles
    - Power and cooling distribution



CEA Hosting Entity meeting

10/09/2025

### Warm water cooling network (+20MW)

- Adaptation work finished in Q2 2025
  - 8 cooling tower of 2,5 MW each @ 35°C outside temperature and 40% outside humidity
  - Expected inlet/outlet temperatures : 35°C / 50°C



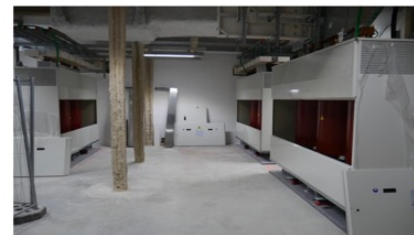
CEA Hosting Entity meeting

10/09/2025



### Electrical power (+24MW)

- Adaptation work finished in Q2 2025
  - 6 transformers 20kV / 410V of 4.2 MVA each
  - 6 low voltage switchboards (6.5 kA max)



transformers



low voltage switchboard  
2025 HPC USER FORUM

07/10/2025



## ALICE RECOQUE WILL SHAPE THE EUROPEAN POST EXASCALE ERA



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Addressing societal, industrial and scientific challenges (such as universe sciences, climate change, health, new energy, innovative materials, transport or smart cities/systems) via large scale numerical simulations, massive data analysis using artificial intelligence (**AI Factory France**) and quantum computing (QC)

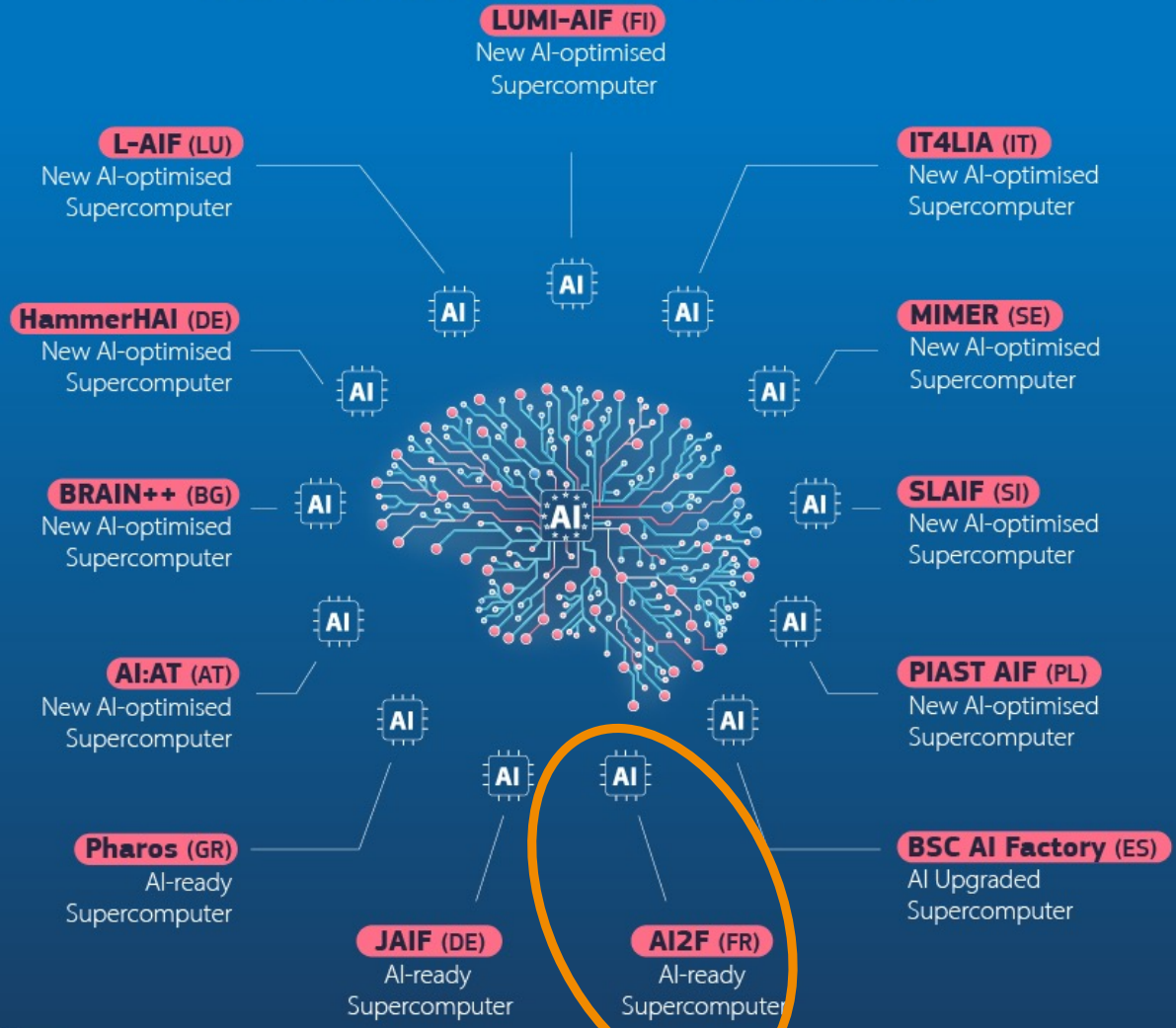
- An accelerator of European Science and Innovation  
open to all scientific and industrial collaborations, supporting new services including Cloud based supercomputing / visualisation, containerisation or **urgent computing for fast decision making and Digital Twins (DTs)**
- A converged HPC/HPDA/AI system with a **modular, balanced and energy efficient architecture**  
based on accelerated, scalar and HPDA partitions within a tiered data centric infrastructure integrating state-of-the-art **post-Exascale quantum accelerators** and related services for specific workloads
- A system fully embedded inside the **digital continuum**  
ready for secured end-to-end workflows from instruments / edge devices to long term sovereign storage
- A system with **European Technology and Skills**  
integrating European hardware / software technologies in terms of computing, storage, network, infrastructure, middleware, applications with global support of AST to engage/support communities.



A system ready to harness European technologies and the best breed  
of opensource software in a highly secure environment



# EUROHPC AI FACTORIES ECOSYSTEM



**EuroHPC**  
Joint Undertaking



# AI FACTORY FRANCE

## Overview

□ 30M€, 3 yrs, 20 partners from academia & innovation



□ With the following objectives as core values

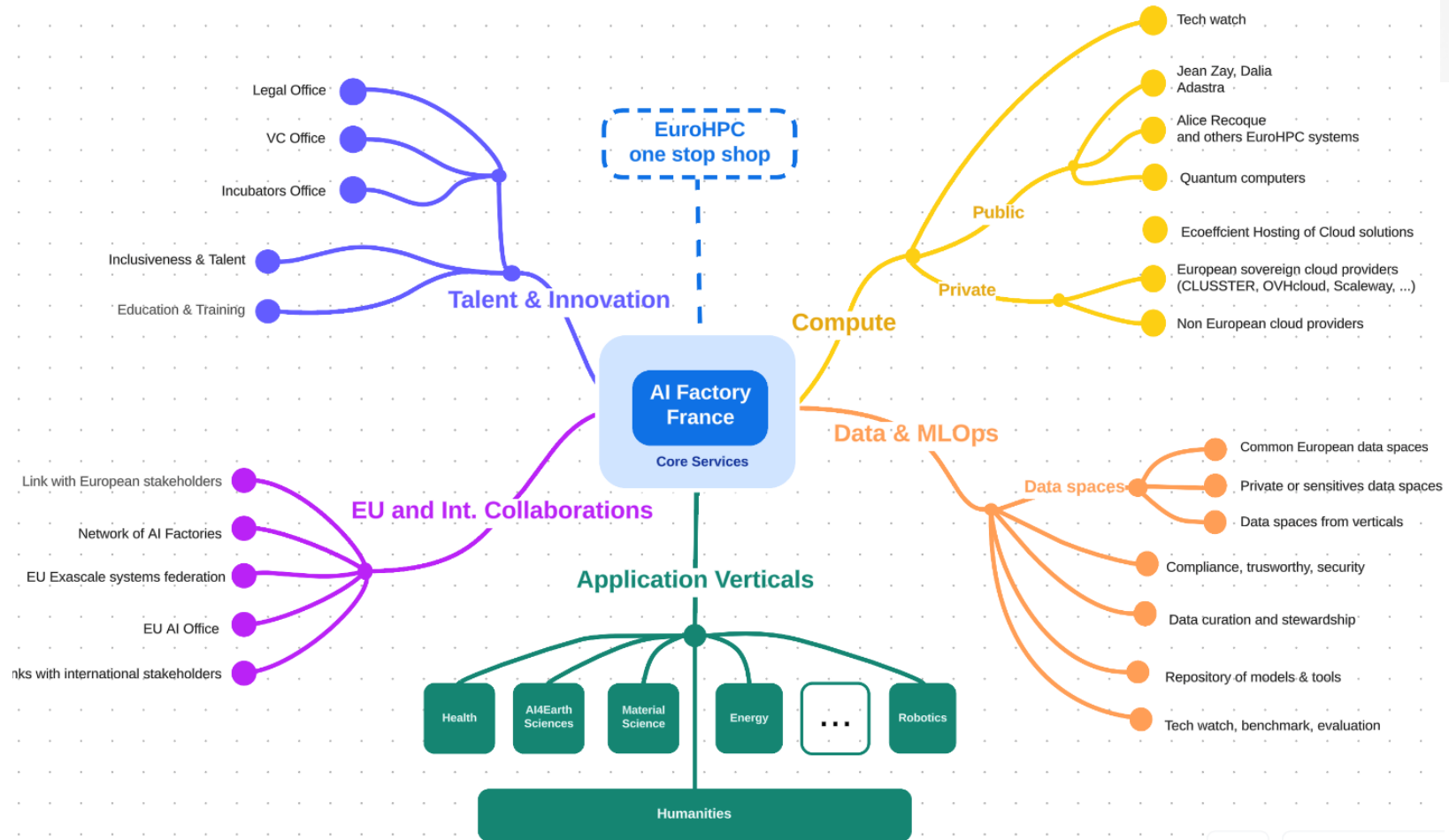
- To provide to the AI community a **one-stop-shop of tailored AI services**
- Support and promote **open-source EU foundational models** and intensify efforts in **domain-specific specialisation** for widening the use of AI in industry, science and public services
- Foster a **close collaboration between research and industry**, increasing tech transfer, develop public / private continuum of facilities/services, startup creation as well as to attract and retain skills with **new career paths**
- Invest **massively** in talent detection, education and permanent (re)training
- Serve **the full AI landscape**, GenAI but also ML, Agentic AI, symbolic and explainable AI

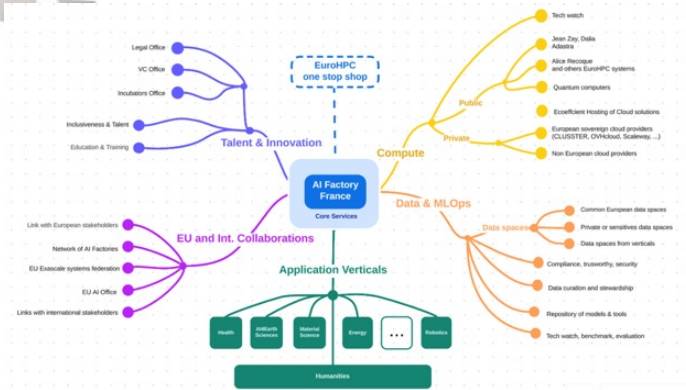
□ More than 40 letters of support including





# AI Factory France value proposal





# 13 Application verticals

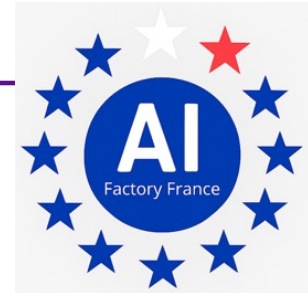
Each vertical has several public/ private demonstrators

<p><b>Robotics &amp; Intelligent Systems</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Exploitation of sectoral data</li> <li>Human-motion generator for AI-powered robotics</li> <li>Frugal AI solutions</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Human-motion generator solution</li> <li>Robotics specific training &amp; hackathon</li> </ul>	<p><b>Health</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>AI at the hospital</li> <li>Personalized medicine</li> <li>AI for genomics</li> <li>Radiology image analysis</li> <li>Neuroscience</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Demonstrators for the 5 focus areas</li> <li>Health data sets with associated services</li> </ul>	<p><b>Earth Observation and Environmental sciences</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>LLMs for data quality</li> <li>Pilots on climate, water, ocean, forest</li> <li>Digital Twin of the French Territory</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>High quality data sets</li> <li>Multi-domain interoperability and cross analysis</li> <li>Demonstrators</li> </ul>	<p><b>Material science</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>All models for atomic scale simulation</li> <li>Materials for sustainable industry</li> <li>Robust material science data spaces</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>AI models; data sets</li> <li>Machine-learning interatomic-potential demonstrator</li> </ul>
<p><b>Mobility</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Autonomous driving</li> <li>Monitoring mobility and analysis its impact</li> <li>Logistic</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Demonstrators for each focused area</li> <li>Open data-sets and models</li> </ul>	<p><b>Defense</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Security of generative AI</li> <li>Transparency of GenAI models</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Defense data sets</li> <li>Hackathon and trainings</li> </ul>	<p><b>Energy and Sustainable development</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Grid operation</li> <li>Predictive maintenance</li> <li>Reduction of CO2</li> <li>Geoscience</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Demonstrators for grid operation and maintenance</li> <li>Energy systems management platform</li> <li>Geoscience tools</li> </ul>	<p><b>Digital continuum</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Real-Time Cyber Physical System</li> <li>Large science instruments (telescope, LHC)</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Pilot for Adaptive Optics</li> <li>Federation of expert pools</li> <li>SDK for AI powered RT-CPS</li> </ul>
<p><b>Aerospace</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Accelerate the design of future aerospace systems</li> <li>Decrease energy consumption of physical modeling and simulation</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Novel AI-powered design tools for aerospace</li> <li>AI and simulation software/algorithms</li> </ul>	<p><b>Edtech</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Edtech solutions for Higher Education and Research</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Co-construction space to design Edtech solutions</li> </ul>	<p><b>Sustainable agriculture</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Yield optimisation</li> <li>Food quality and safety</li> <li>Circular economy</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Collaborative platform</li> <li>Pilots</li> <li>Dedicated models for agriculture</li> </ul>	<p><b>Finance</b></p> <p><b>Focus</b></p> <ul style="list-style-type: none"> <li>Financial risk management</li> <li>Trustable AI in finance</li> </ul> <p><b>Outputs</b></p> <ul style="list-style-type: none"> <li>Demonstrators for Financial risk management</li> <li>Trustable LLMs for finance</li> </ul>
<p><b>Humanities</b></p> <p><b>Focus:</b> LLMs ALT-EDIC collaboration; access to research data; Software heritage</p> <p><b>Outputs:</b> Development of European LLMs; tools for research data access; infrastructure for code heritage</p>			





## AI FACTORY FRANCE



### Status

#### □ Ongoing contractualisation with EuroHPC

- objective -> signature Grant Agreement in october, **possible retroactive start on Sept 1<sup>st</sup>**
- **kick off meeting of AI Factory France** on November 5<sup>th</sup> at Station-F

#### □ Ongoing context of results delivery since March 5<sup>th</sup> :

- Access to GENCI' national AI supercomputers and services
  - Dynamic access (fast track, always open) : **592 AI projects with 81 from industry** (including Thales, Renault, Valeo, Kermap, HuggingFace, Kog, Craft.ai, Doctrine...)
  - Regular access (larger allocations, twice a year) : **81 AI projects with 28 from industry** (HuggingFace, Entalpic, Safran.ai, Gleamer, LightOn, Linagora, Bioptimus...)
- New AI system available : DALIA at IDRIS, one of the 1<sup>st</sup> NVIDIA NVL72 system in Europe targeted to new AI services
- Education and training
  - End-to-end LLM bootcamp at TGCC (CEA) with NVIDIA
  - IDRIS AI/HPC hackaton on Jean Zay with NVIDIA and 5<sup>th</sup> edition of the « Deep Learning for Science » workshop
  - Regular training at IDRIS (use of Jean Zay for AI, optimisation of models) and Inria (introduction & advanced use of scikit-learn for SMEs)
- First users of public/private sovereign continuum support



a health AI startup (breast cancer) using GENCI for research activities and Scaleway for commercial inference

Announcement during Vivatech 2025 of a strategic partnership between Scaleway, GENCI and CNRS toward a public / private sovereign Cloud for AI



And FR/UK partnership with GENCI and Univ. Bristol on AI Factory collaboration

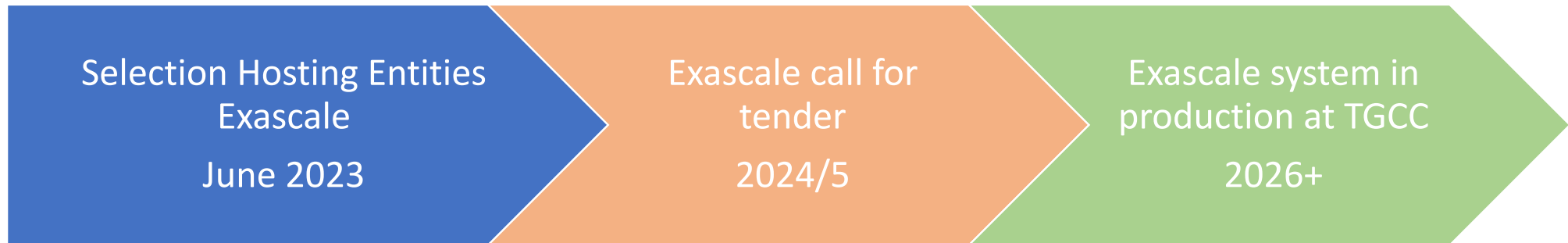


# TIMELINE FOR THE EXASCALE PROJECT



EuroHPC  
Joint Undertaking

## Schedule of the project



Answer from GENCI/CEA  
and partners of the  
Exascale consortium

Tender procedure driven by  
EuroHPC with HE

Delivery, installation and  
production for 5 years

- H2 September : final offers
- SC25 : announcement of the selection
- Q1 2026 : start of the inception programme with end users communities