



# The European High Performance Computing Joint Undertaking

## LEADING THE WAY IN EUROPEAN SUPERCOMPUTING

September 2023 | Anders Dam Jensen

# WHO ARE WE?



- An EU body & a legal and funding entity
- Created in 2018 and autonomous since September 2020
- Based in Luxembourg
- A team of 35 employees, still in the process of recruiting additional employees throughout 2023

# OUR MISSION

The EuroHPC JU pools together the resources of its members to:

- Develop, deploy, extend & maintain a world-leading supercomputing, quantum computing, service & data infrastructure ecosystem in Europe
- Support the development of innovative supercomputing components, technologies, knowledge & applications to underpin a competitive European supply chain
- Widen the use of HPC & quantum infrastructures to a large number of public & private users wherever they are located in Europe and supporting the development of key HPC skills for European science and industry

# OUR MEMBERS

- 33 participating countries
- The European Union (represented by the European Commission)
- 3 private partners

Each of our members is represented in the EuroHPC JU's Governing Board

The Governing Board also takes advice from the EuroHPC Industrial and Scientific Advisory Board (INFRAG & RIAG)



# INDUSTRIAL AND SCIENTIFIC ADVISORY BOARD

The two advisory groups provide advice on R&I and Infrastructure, drawing up draft multiannual strategic agendas to guide the activities of EuroHPC in these areas.

## INFRAG

### The Infrastructure Advisory Group (INFRAG)

- Provides advice on the acquisition and operation of the supercomputers;
- Issues recommendations on the federation and interconnection of the EuroHPC infrastructure;
- Advises on training activities for end-users and opportunities for promoting take-up and use of European technology solutions notably by the national HPC Competence Centres;
- Consults with public and private stakeholders to inform them and collect feedback.

**Chaired by Sinead Ryan**

## RIAG

### The Research and Innovation Advisory Group (RIAG)

- Provides advice on potential international cooperation activities;
- Issues recommendations for training and education priorities addressing key competences in HPC;
- Consults with public and private stakeholders to inform them and collect feedback.

**Chaired by Jean-Philippe Nominé**

# LEVEL AND SOURCES OF EU FUNDING 2021-2027

Digital Europe Program  
**1.98B Eur**

**Infrastructure**

**Federation of  
supercomputing  
services**

**Widening usage and  
skills**

Horizon Europe Program  
**900M Eur**

**Technology**

**Application**

**International  
Cooperation**

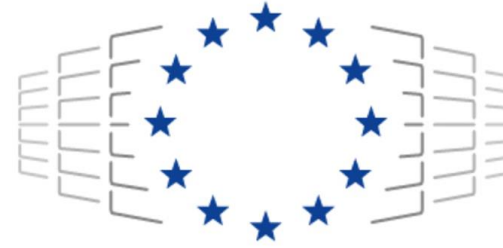
Connecting Europe  
Facility  
**200M Eur**

**Hyperconnectivity**

**Data connectivity**

\*Member states to match this with national contributions

# A EUROHPC UPDATE



**EuroHPC**  
Joint Undertaking

## WORLD-CLASS MACHINES:

- LUMI and Leonardo ranked in the TOP500 list at #3 and #4
- All EuroHPC machines in the TOP500

## GROWING THE EUROHPC FLEET:

- Ongoing procurement for the 1<sup>st</sup> European exascale supercomputer: JUPITER located in Germany
- Selection of the Jules Vernes consortium to host the 2<sup>nd</sup> exascale system in France
- More midrange systems to come in Greece, Hungary, Ireland, Poland and Sweden

## GETTING INTO QUANTUM:

- Hosting agreements signed for 6 quantum computers in 6 European countries, including Poland
- PASQAL selected to provide two quantum simulators through the project HPCQS

## SUPPORTING EUROPEAN INNOVATION:

- Around 40 ongoing R&I projects, including 10 CoEs and more projects to come in the coming months

## INVESTING IN EUROPEAN SKILLS:

- EUMaster4HPC programme – applications for the second cohort of students open until 15/09
- Multiple calls for training and traineeships

# THE EUROHPC SUPERCOMPUTERS



**7 operational systems, all ranking among the world's most powerful supercomputers:**


- Vega in Slovenia
- Karolina in Czechia
- Discoverer in Bulgaria
- Meluxina in Luxembourg
- LUMI in Finland
- Leonardo in Italy
- Deucalion in Portugal

**3 systems underway:**


- MareNostrum5, a pre-exascale system in Spain
- Jupiter, the 1<sup>st</sup> European Exascale supercomputer in Germany
- Daedalus, a mid-range system in Greece










# THE EUROHPC QUANTUM COMPUTERS



The EuroHPC JU has signed hosting agreements for six new quantum computers in Europe co-funded by the European Union

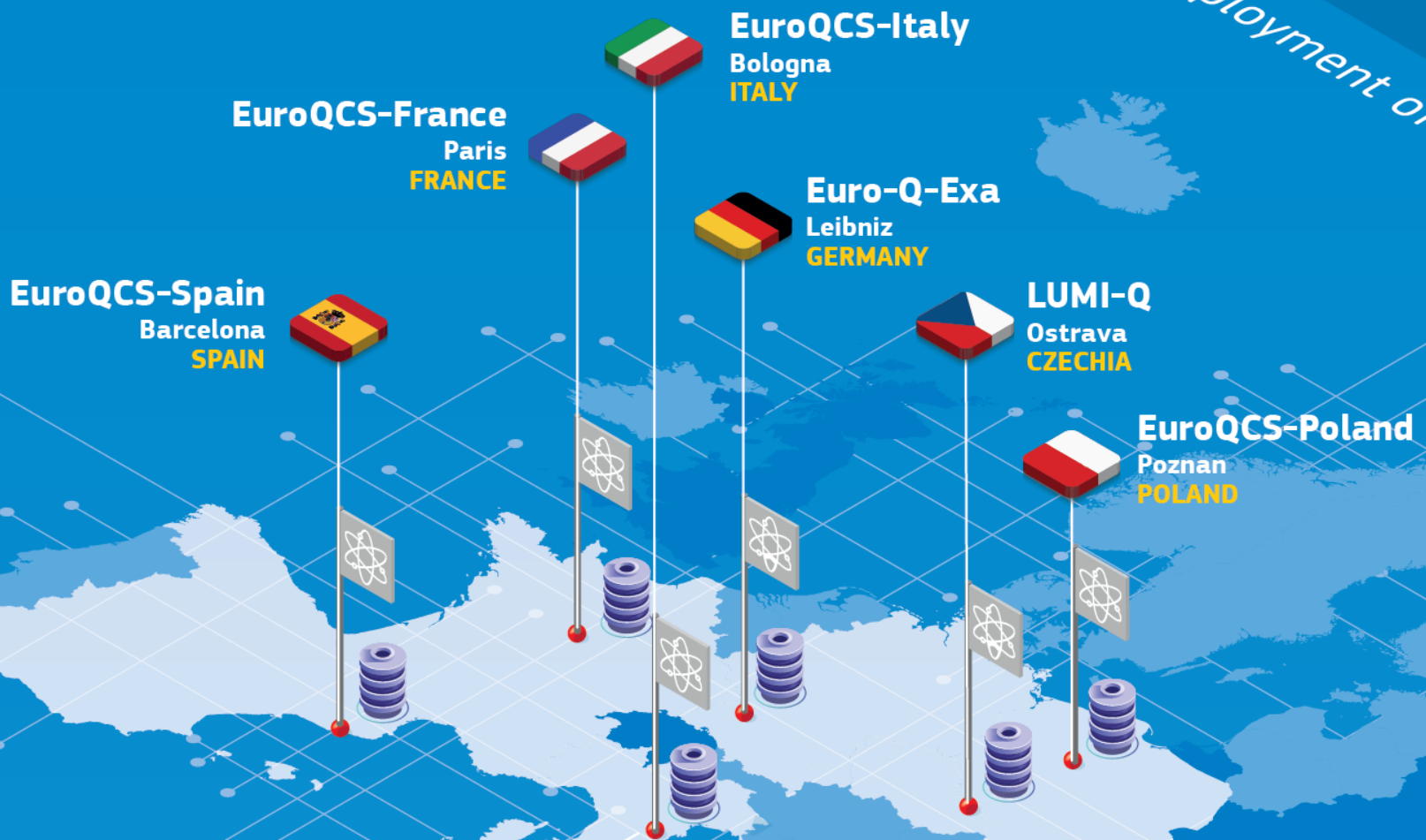
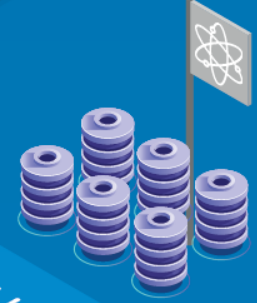


-  LUMI-Q - Czechia
-  EuroQCS-France
-  Euro-Q-Exa - Germany
-  EuroQCS-Italy
-  EuroQCS-Poland
-  EuroQCS-Spain



In June 2023, the EuroHPC JU signed hosting agreements with six sites across Europe to host & operate EuroHPC quantum computers. These quantum computers will allow European users to explore a variety of quantum technologies coupled to leading supercomputers.

# Deployment of EuroHPC QUANTUM COMPUTERS



# COMING SOON: JUPITER, THE FIRST EUROPEAN EXASCALE

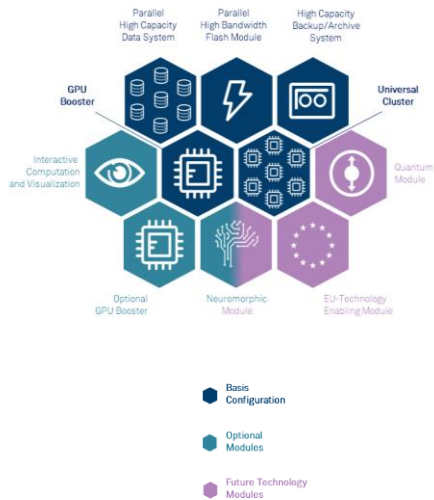


**JÜLICH** | JÜLICH SUPERCOMPUTING CENTRE  
Forschungszentrum

## JUPITER THE ARRIVAL OF EXASCALE IN EUROPE

**Contact**

✉ [jupiter@fz-juelich.de](mailto:jupiter@fz-juelich.de) | [fz-juelich.de/jupiter](https://fz-juelich.de/jupiter)



- ❑ The first European supercomputer capable of **one billion billion ( $10^{18}$ ) calculations per second**
- ❑ Based on a **modular supercomputing architecture**
- ❑ Designed to be green, **powered by green electricity**, with water cooling system and plans for intelligent use of its waste heat
- ❑ JUPITER will help to solve questions regarding climate change, pandemics, sustainable energy production as well as enabling the use of AI and data science on a large scale
- ❑ Will be installed on the campus of Forschungszentrum Jülich in 2023 and operated by the Jülich Supercomputing Centre

# ACCESS TO EUROHPC SUPERCOMPUTERS

## WHO IS ELIGIBLE?

- Academic and research institutions (public and private)
- Public sector organisations
- Industrial enterprises and SMEs

→ Open to all fields of research

## WHICH TYPES OF ACCESS EXIST?

- Regular access
- Extreme scale access
- Benchmark & Development access
- Special access

Regular and extreme scale access calls are continuously open, with several cut-offs throughout the year triggering the evaluation of proposals.

## WHAT ARE THE CONDITIONS FOR ACCESS?

Access is free of charge. Participation conditions depend on the specific access call that a research group has applied to.

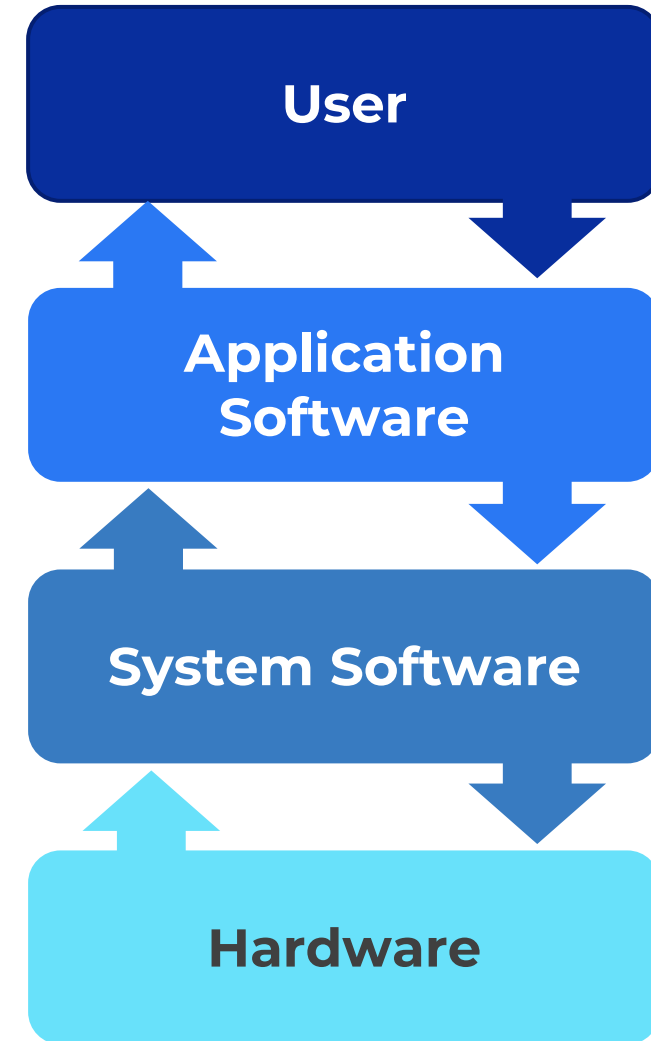
In general users of EuroHPC systems commit to:

- acknowledge the use of the resources in their related publications
- contribute to dissemination events
- produce and submit a report after completion of a resource allocation

More information on EuroHPC access calls available at: [Access to Our Supercomputers \(europa.eu\)](https://europa.eu/Access-to-Our-Supercomputers)

# STRATEGIC R&I – INTERVENTION AREAS

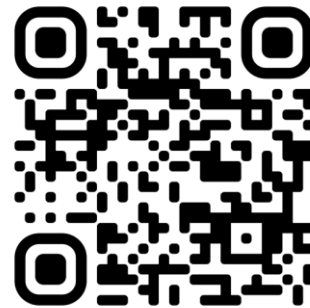
- » **Leadership in Use & Skills**  
Competence Centres and training programmes in HPC commensurate with the labour market.
- » **Applications and Algorithms**  
Centres of Excellence for HPC Applications and new algorithms for European exascale technology.
- » **European Software Stack**  
Software and algorithms, programming models and tools for exascale and post exascale systems.
- » **European Open Hardware**  
Ecosystem for the low power high-end general purpose processor and accelerator.



# THANK YOU



**For more information, feel free to visit our website and social media:**



[eurohpc-ju.europa.eu](http://eurohpc-ju.europa.eu)



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