EuroHPC
Joint Undertaking

The European High Performance Computing Joint Undertaking (EuroHPC JU) pools together resources of the European Union (EU), European countries and private partners to develop a world class supercomputing ecosystem in Europe, boosting European competitiveness, innovation and improving European citizens' quality of life.

Leading the Way in European Supercomputing

Since 2020, EuroHPC JU is contributing to the EU's digital autonomy with:

8 world-class EuroHPC supercomputers deployed across Europe, and increasing European compute power by more than 50% – adding 1 ExaFLOP available for European science and industry;
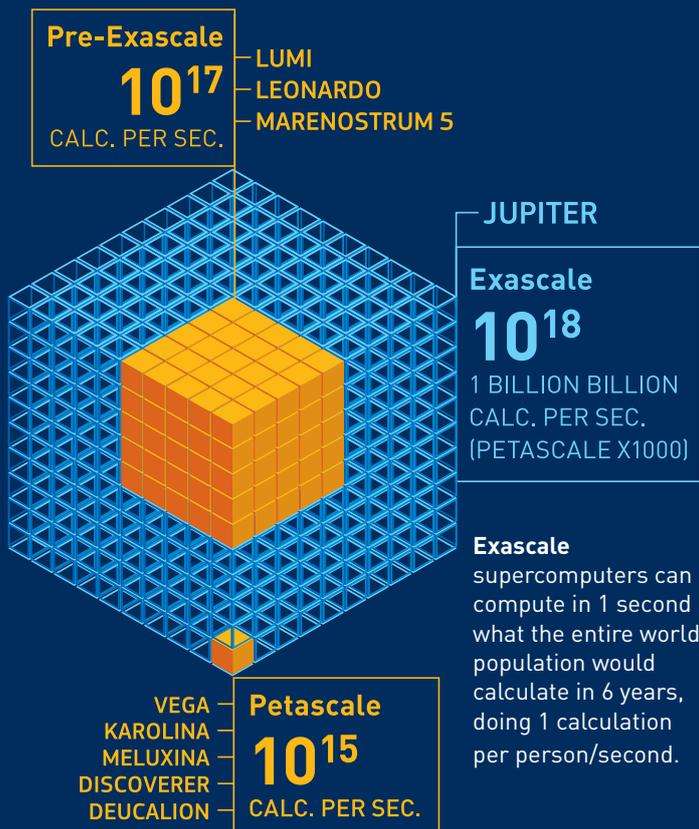
40+ Research & Innovation (R&I) projects supporting European technologies, applications, software and skills initiatives;

Access for European users to cutting-edge supercomputing resources and to the most advanced public HPC infrastructure in the world – that European scientists can use for free.

European top-notch supercomputers

Pre-Exascale
10^{17}
CALC. PER SEC.
— LUMI
— LEONARDO
— MARENOSTRUM 5

— JUPITER

Exascale
10^{18}
1 BILLION BILLION CALC. PER SEC.
(PETASCALE X1000)

Exascale supercomputers can compute in 1 second what the entire world population would calculate in 6 years, doing 1 calculation per person/second.

VEGA
KAROLINA
MELUXINA
DISCOVERER
DEUCALION

Petascale
10^{15}
CALC. PER SEC.

Enabling European R&I

EuroHPC JU funds an ambitious R&I programme to develop a full European HPC ecosystem, with:

Open hardware and software, with projects like the European Processor Initiative (EPI), developing the first European chip for HPC, that will power EuroHPC supercomputer JUPITER, the upcoming exascale system in Europe;

12+ Centres of Excellence, to improve performance of algorithms in strategic domains, and adapt applications to exascale and future post-exascale supercomputing;

30+ National Competence Centres, acting as point of access for HPC in each country, supporting adoption of HPC, delivering trainings, mapping skills, interacting with industry, etc.;

Training courses for the next generation of European HPC experts: EUMaster4HPC, HPC SPECTRA, and more in the future.

A bright future for European scientific discoveries and competitiveness

EuroHPC JU will continue bringing Europe to the forefront of HPC and quantum computing, with:

2 world-class exascale supercomputers and a system dedicated to European industrial users;

Diverse quantum computing technologies, integrated into supercomputers across Europe;

The interconnection and federation of EuroHPC supercomputers and quantum computers;

Access to compute power for European startups developing Artificial Intelligence (AI) models.

An AI Support Centre, to provide HPC services for developers and users of AI models;

2 European Quantum Excellence Centres dedicated to applications for quantum computing;

Innovative energy-efficient HPC software technologies tailored to future generations of supercomputers;

The EuroHPC Training Academy, to develop coordinated and harmonised HPC education programmes.

European quantum computers

QUANTUM

Quantum computers integrated into supercomputers will be able, for defined complex tasks, to compute in a few seconds what the fastest supercomputer alone would take several years. It will accelerate calculations, make HPC greener and break currently unsolvable problems.

HPC for EU AI startups and research

Trustworthy **AI**, developed by European startups on EuroHPC supercomputers, will contribute to radically accelerating the pace of scientific progress - bringing about a new renaissance of discoveries.

AI

Benefits for the planet and for European citizens

Supercomputers, quantum computers and AI are essential for the digital transformation and will entail a revolution in science; they interact as a super-powered brain, enabling scientific breakthroughs in every field.

Supercomputing can:

Model the human body, allowing personalised medicine and discover new lifesaving treatment faster - like in the EuroHPC project MICROCARD, simulating the cells of the human heart;
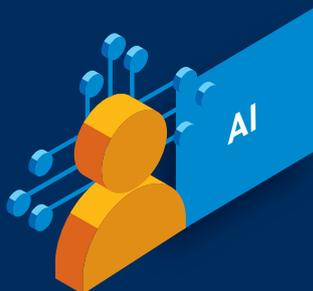
Simulate Earth's natural phenomena and human impacts, contributing to the Green and Digital transitions - like in Destination Earth project, or in EuroHPC project MAELSTROM, using large-scale machine learning application for climate science;

Upgrade engineering design, improving sustainability and competitiveness of industry - like in EuroHPC project NextSim, for lighter and fuel-efficient aircraft, or EXCELLERAT P2, for a low-carbon mobility and energy production.

Access EuroHPC supercomputing power to boost your research!