



EuroHPC systems for SMEs: Success stories

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Why do SMEs Need Supercomputers?

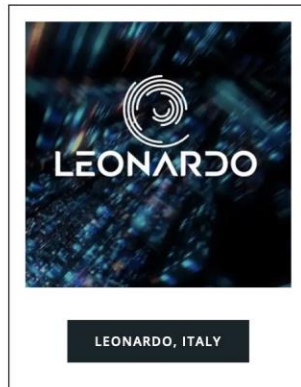


- 1. Innovation**
- 2. Cost saving**
- 3. Competitive market**
- 4. Profit**

HPC can reduce product design and production cycles, accelerate the design of new materials, minimise development and manufacturing costs, and increase resource efficiency.

Current EuroHPC JU systems

Secure, quick, agile



LUMI

Cray EX supercomputer supplied by HPE
Sustained perf: 375 petaflops
Peak perf: 552 petaflops
64-core next-generation **AMD** EPYC™ CPUs,
future generation **AMD** Instinct™ GPU

Leonardo

Supplied by Atos, based on the BullSequana XH2000, Sustained perf: 249.4 petaflops
Peak perf: 322.6 petaflops
Intel Ice-Lake (Booster), Intel Sapphire Rapids (data-centric), **NVIDIA** Ampere architecture-based GPUs,

Vega

Supplied by Atos, based on the BullSequana XH2000, 6,8 petaflops, **AMD** EPYC 7H12 64core, 240 **Nvidia** A100 cards

Karolina

Supplied by HPE, based on an **HPE** Apollo 2000Gen10 Plus and **HPE** Apollo 6500, 9,13 petaflops

Meluxina

Supplied by Atos, based on the BullSequana XH2000, committed 10 petaflops HPL, 2+ petaflops HPL, **AMD** EPYC, **NVIDIA** A100

Discoverer

Supplied by Atos, based on the **BullSequana** XH2000, 4,44 petaflops, **AMD** EPYC 7H12 64core

Types of access



EuroHPC JU Extreme Access

For getting a large amount of compute time (12 to 24 month access)



EuroHPC JU Regular Access

For getting a large amount of compute time (12 month access)



EuroHPC JU Development Access

For developing your solution or software (6-12 month access)



EuroHPC JU Benchmark Access

For benchmarking and small tests (3-month access)

Application portal <https://pracecalls.eu/>

*NOTE: Extreme Access calls target flagship applications that scale to thousands of CPUs and GPUs





The project in numbers

Nr. of partners: **6**
Duration: **36** months
Budget: EUR **9 998 475.00**

Start date: **01.09.20**
End date: **31.08.23**



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FF4EUROHPC

SHIFT YOUR BUSINESS TO THE NEXT LEVEL WITH THE HELP OF HPC.



www.ff4eurohpc.eu

The FF4EuroHPC project aims to

- ➔ Increase the **innovation potential of industry**, and in particular of SMEs, using High Performance Computing (HPC) infrastructures, applications and services.
- ➔ Connect SMEs with experts, including those active in the new **national HPC Competence Centres** (NCCs).
- ➔ **Foster wider innovations** by exchanging and promoting best practice use cases or application experiences.
- ➔ Provide an effective mechanism for **inclusion of innovative, agile SMEs lowering the barriers** for small actors to enter the market and exploit new business opportunities.

The FF4EuroHPC mission is to

- ➔ **support EuroHPC**
- ➔ to promote industrial uptake of HPC technology
- ➔ to increase **the innovation potential.**

The key concept behind FF4EuroHPC is to demonstrate to SMEs how they can strongly benefit from the use of advanced HPC services and thereby take advantage of these innovative ICT solutions for business benefits.

Follow us and get inspired!



@FF4EuroHPC



NCCs are your help centre!

The National Competence Centres (NCCs) are the **central points of contact** for HPC and related technologies in their country.

Their missions are to:

- Develop and display a comprehensive and transparent map of **HPC competences and institutions** in their country
- Act as a **gateway for industry and academia** to providers with suitable expertise or relevant projects, may that be national or international
- Collect **HPC training offers** in their country and display them on a central place together with international training offers collected by other NCCs
- Foster the **industrial uptake of HPC**



<https://www.eurocc-access.eu/about-us/meet-the-nccs/>

Training




Event feed: [Download](#) [Copy URL](#)

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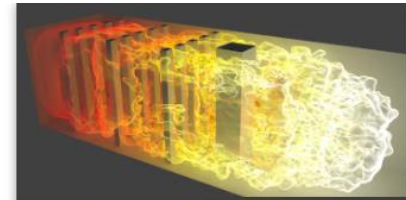


[Difficulty Level](#) [Language of Instruction](#) [Country](#) [Audience](#) [Format](#) [Scientific Domain](#) [Technical Domain](#)



All items per page

 <p>Hybrid Apr 12 - Apr 13 2023</p> <p>AI Training Series - Orientation Session</p> <p>Germany</p> <p>This two-day "Orientation Session" is the kick-off event of the "LRZ AI Training Series", a series of courses aiming at the needs and...</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>	 <p>Online Apr 17 - May 14 2023</p> <p>Supercomputing-Akademie: Datenmanagement</p> <p>Germany</p> <p>Das Modul _Datenmanagement_ enthält eine Einführung in das Thema Daten und macht Sie mit den Grundlagen vertraut. Das Team von Dr....</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>	 <p>Germany Apr 17 - Apr 19 2023</p> <p>GPU Programming Part 1: Foundations</p> <p>Germany</p> <p>GPU-accelerated computing drives current scientific research. Writing fast numeric algorithms for GPUs offers high application...</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>
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[Training – EuroCC ACCESS \(eurocc-access.eu\)](https://eurocc-access.eu)

 <p>France Apr 17 - Apr 21 2023</p> <p>Numerical methods for Large Eddy Simulation</p> <p>France</p> <p>The [AVBP] (https://services.excellerat.eu/viewcode/5) code is a parallel code of fluid mechanics that solves compressible...</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>	 <p>Online Apr 17 - Apr 18 2023</p> <p>EuroCC2 AI for Science Bootcamp</p> <p>Germany</p> <p>During this online bootcamp, participants will learn how to apply AI tools, techniques, and algorithms to real-life problems...</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>	 <p>Online Wed Apr 19 2023</p> <p>Introduction to LRZ HPC Systems with Focus on CFD Workflows</p> <p>Germany</p> <p>The focus of this short course is to provide to beginners in High Performance Computing (HPC) and Computational Fluid Dynamics (CFD)...</p> <p>▶ Click here for more details</p> <p>Event website</p> <p>Google Outlook</p>
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1,5 years of EuroHPC JU systems usage

- As of 31 December 2022 there were **394** projects of these **~11% (private and public administration sector)**
- **20** SMEs (7 through Regular access calls)
- **21** governmental organisations (3 through the Regular access calls)
- SMEs are from Sweden, Spain, Slovenia, Turkey, Italy, France, Finland, Croatia and Belgium.

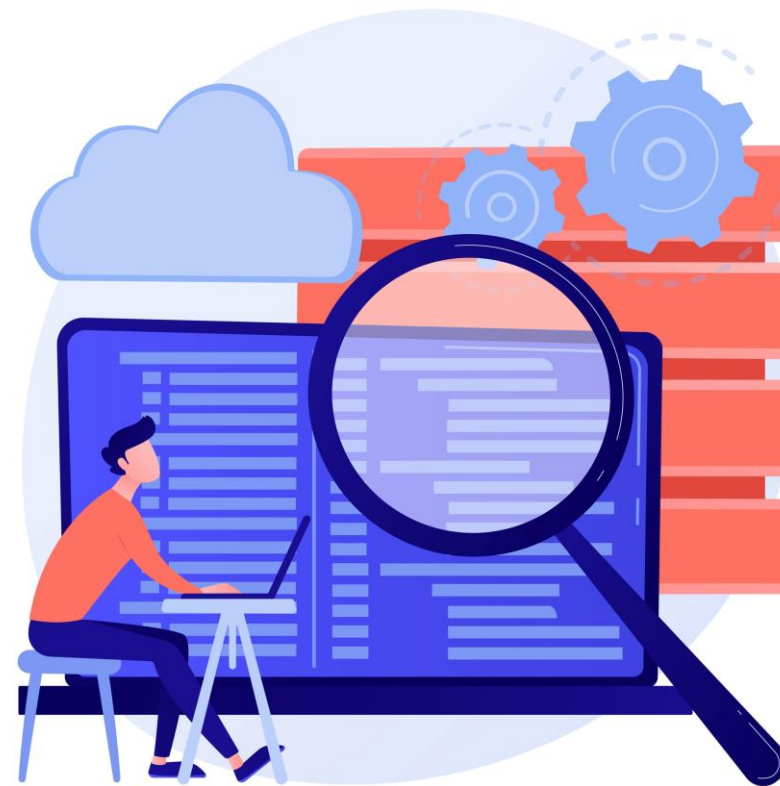
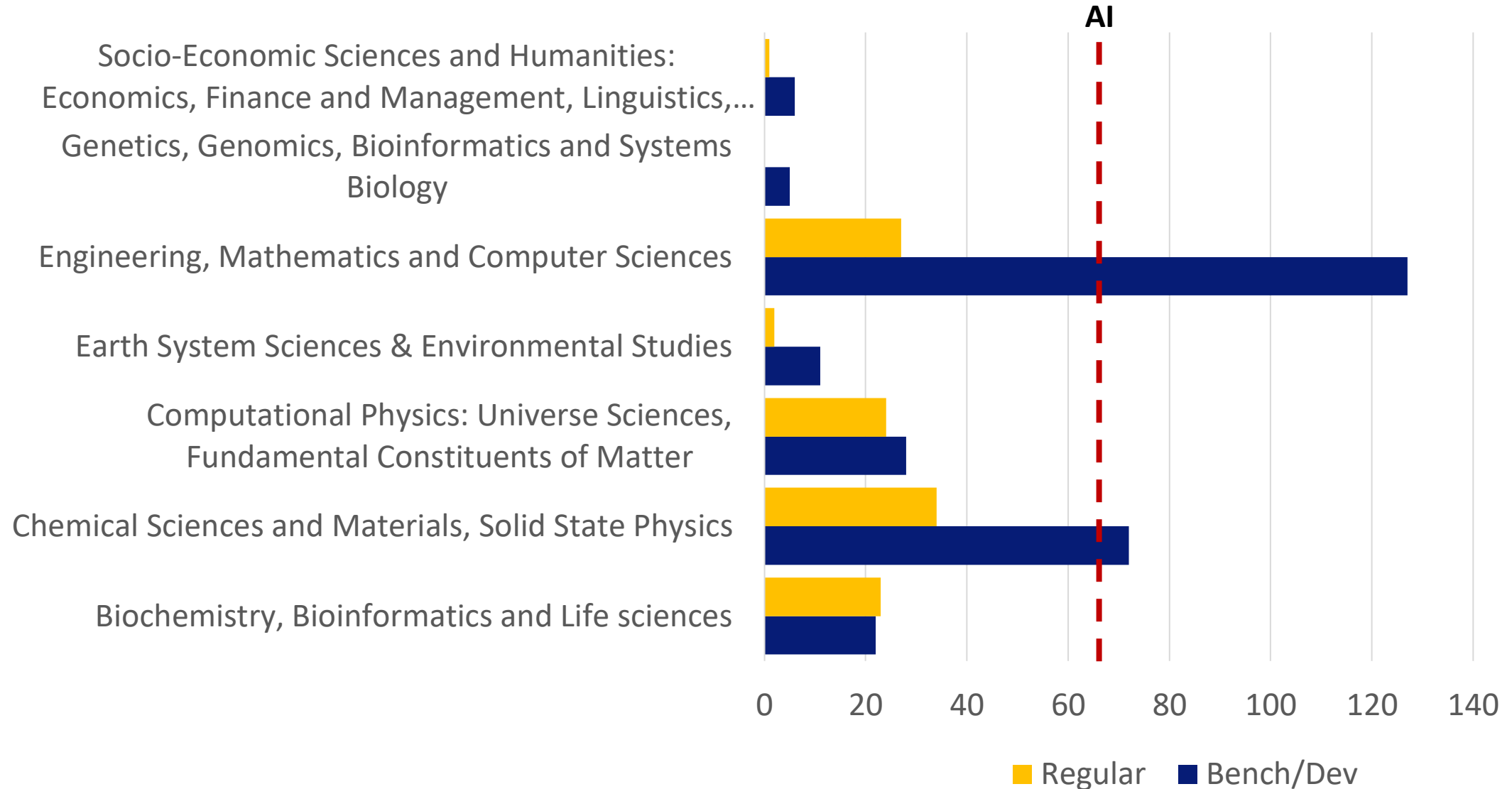


Image by vectorjuice on Freepik

Number of Applications per Discipline by December 2022

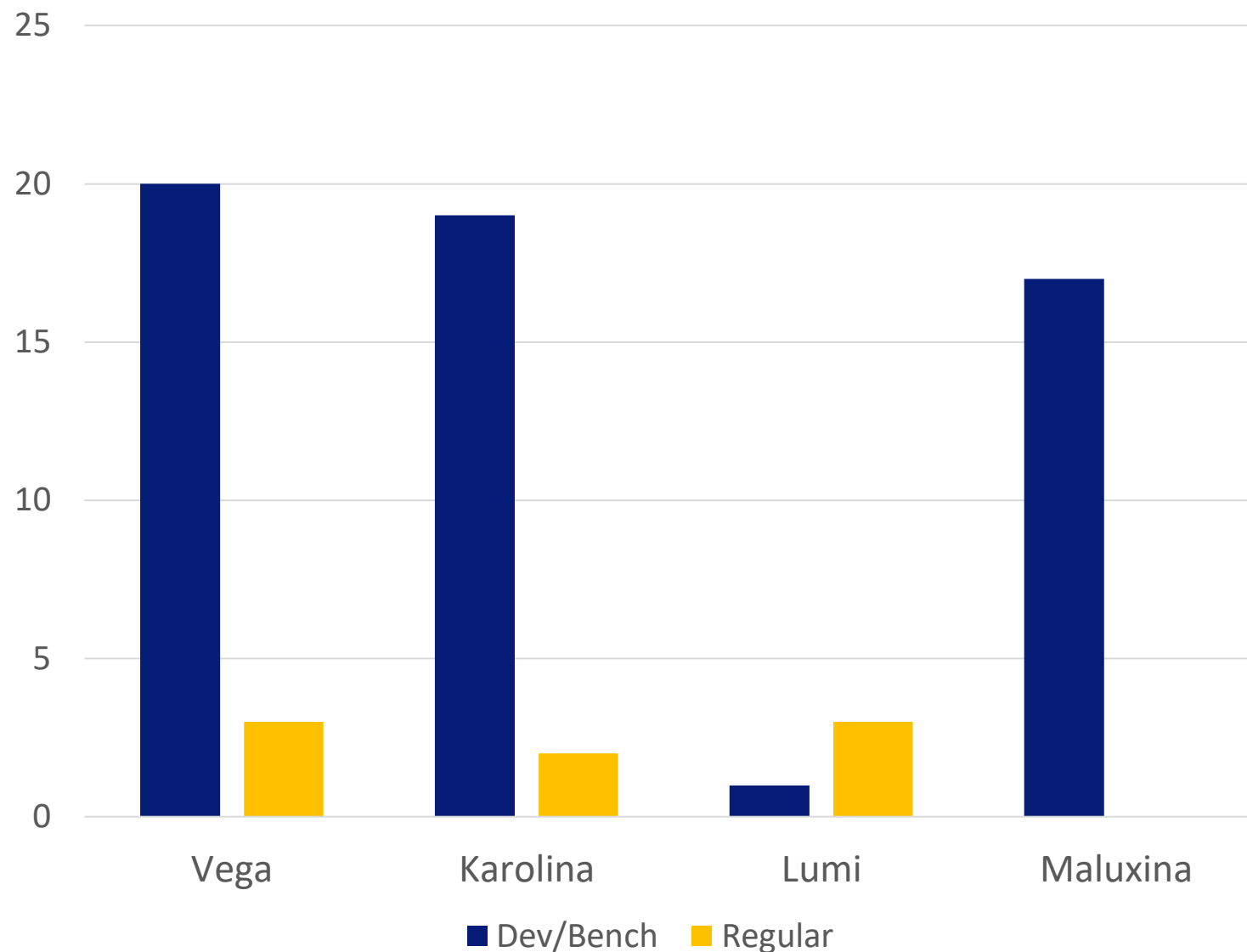


AI Applications per System by December 2022



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AI: Machine learning/NLP



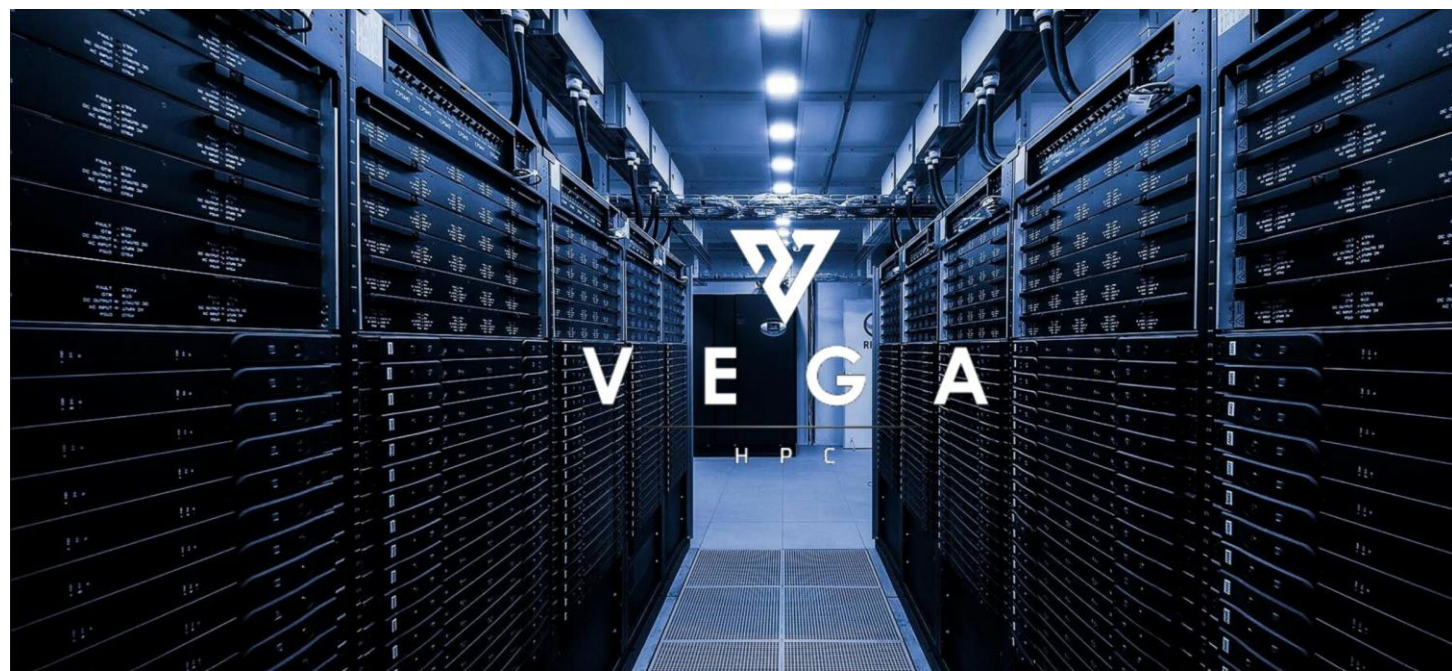


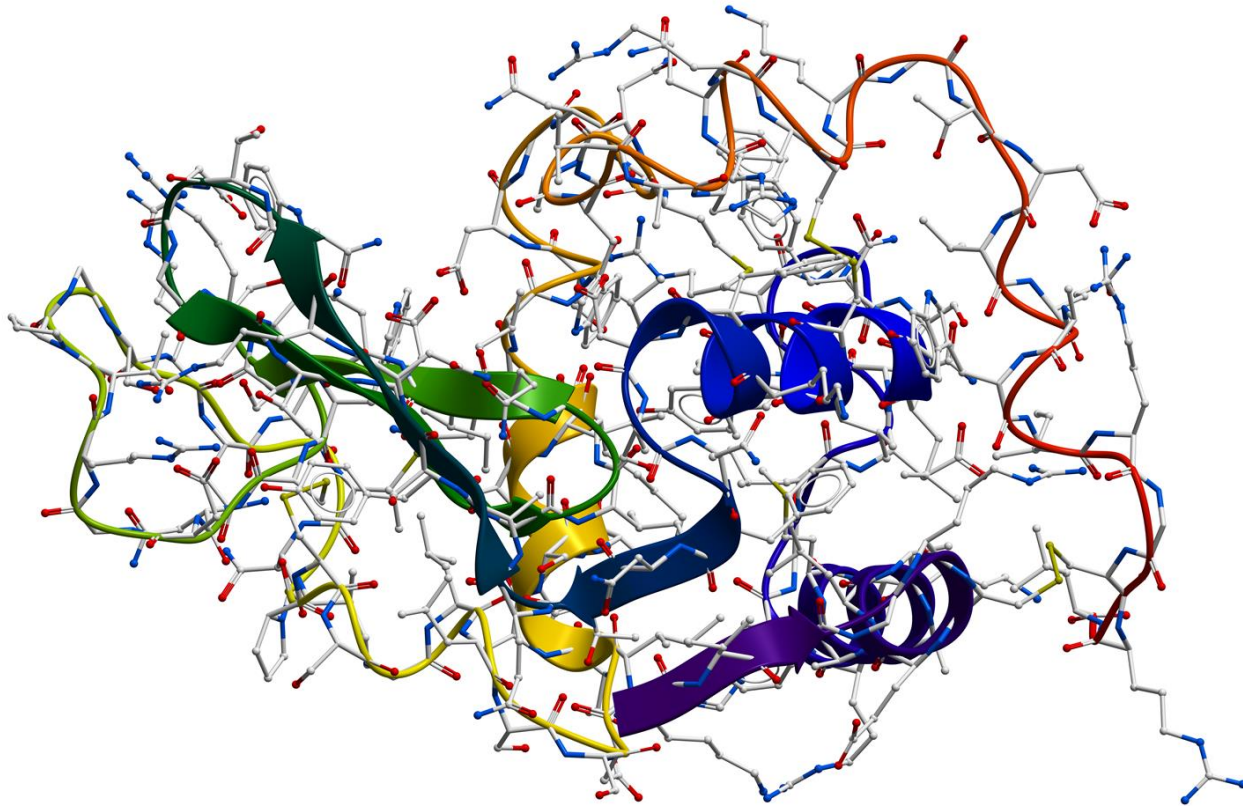
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Simulations of the electrochemistry relevant for battery development

Use of classical and reactive molecular dynamics and quantum chemical simulations to devise bottom-up design strategies for improved batteries.

northvolt





Skin permeability

- Atomistic model of the main barrier in human skin
- Predict drug permeability using molecular dynamics simulations (GROMACS)

1 920 000 CPU Core Hours

384 000 GPU Core hours

Using EuroHPC JU Vega System by the Croatian SME Called TIS



System for Early Neurological Deviation Detection

A unique **AI** solution for assessing the quality of spontaneous movements (fidgeting).

The target:

Children in early infancy (2-3m)

The purpose:

Detecting infants at high risk of neurodevelopmental disorders or expected normal outcome in a group of neuro risky children

Goal: **AI system** automatically detects neurological risk infants

FF4EuroHPC: AI/ML COMPUTER VISION FOR THE NEXT GENERATION POULTRY FARMS



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Researchers from this consortium have engaged a large number of poultry farms of different sizes. The main goal of the engagement was to understand their business challenges and to present an IoT based poultry farm management solution, supported by a set of sensors for environmental monitoring. The use of HPC and deep learning AI was used to create prediction models that can be deployed on the edge devices equipped with camera sensors for the use in IoT/AI solutions in the poultry sector.

SECTOR: Agriculture

TECHNOLOGY USED: HPC, Machine Learning, Edge Computing

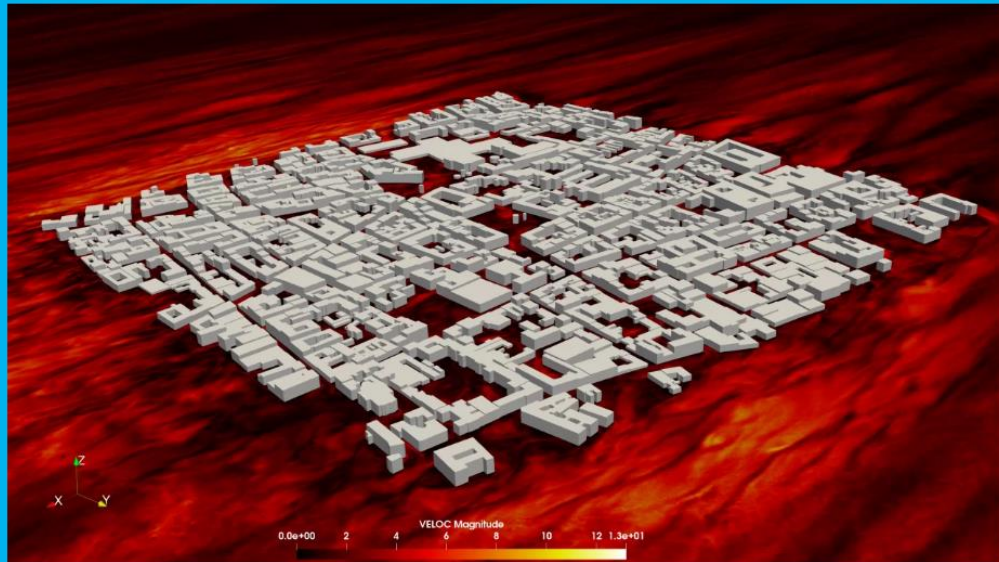
COUNTRY: Montenegro

 [1003_Success Story Flyer](#)

AI-AIDED WIND FLOW AND GAS DISPERSION SIMULATIONS IN CITIES



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Nowadays, the distribution of pollutants at street and urban level is not completely understood because the sources of the emissions of the gas concentrations may change fast at a given location and between nearby sites. In this context, HPC and Computational Fluid Dynamics (CFD) are key tools for tracking the dispersion of pollutants with high resolution. The goal of this experiment is to train Generative Adversarial Networks that mimic the output of HPC-CFD simulations at an affordable cost and to add them to Bettair's map generation pipeline.

SECTOR: Environmental

TECHNOLOGY USED: CFD Simulations

COUNTRY: Spain

 [1012_Success Story Flyer](#)

Thank you!

Questions?