EuroHPC Access for UK Researchers: Opportunities Beyond Local HPC

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EuroHPC Joint Undertaking (EuroHPC JU)

- Develops and operates Europe's world-class **pre-exascale and exascale** supercomputing infrastructure.
- Enables researchers and industry to access advanced HPC resources through competitive access programmes.

Free EuroHPC Compute Resources for UK Researchers

- UK researchers are eligible to apply for EuroHPC computing resources, gaining access to some of Europe's largest supercomputers.
- Resource allocation model:
  - A proportion of resources is reserved for the hosting country or consortium.
  - The remaining resources are allocated through competitive EuroHPC access calls.
- Successful proposals receive free compute allocations through EuroHPC access programmes- No direct funding required
- Current opportunity (based on recent DiRAC communication):
  - CPU-based EuroHPC resources are currently underutilized.
  - CPU Proposals have a higher likelihood of success, making this an excellent time to apply.
- EuroHPC is particularly useful when:
  - Institutional or national HPC resources cannot meet the computational requirements..
  - Access to specialised hardware (e.g. AMD MI250X, NVIDIA A100/Hopper GPUs or FPGA systems) is required.
  - Large-scale scalability studies are required.
  - Cloud resources becomes prohibitively expensive.

Access Routes & Application Process

- The application process is straightforward:
  - Create an account on the EuroHPC Access Portal.
  - Select the appropriate access call.
  - Submit a short technical proposal describing your project and resource requirements.
  - Resource allocation is reviewed.
  - If successful, receive an account and compute allocation.

Access Mode	Typical use	Deadline
Development Access	Code development, porting, optimization, and testing	Monthly
Benchmark Access	Large-scale scalability and performance benchmarking	Monthly
Regular Access	Scientific production workloads requiring substantial HPC resources	August 2026 end
Extreme Scale Access	Flagship simulations requiring the largest EuroHPC allocations	September 2026 end

https://access.eurohpc-ju.europa.eu/

AVAILABLE SYSTEM FOR ACCESS

❑ Multiple systems with diverse hardware configurations, from CPU-only to CPU+GPU and FPGA architectures.

SYSTEM	SITE (Country)	PARTITION	PROCESSOR	ACCELERATOR	**BENCH	**DEVEL
ARRHENIUS	NAISS (SE)	Arrhenius CPU	AMD Epyc	-	500	1000
		Arrhenius GPU	NVIDIA Grace	NVIDIA Hopper	300	500
Jupiter	JSC (DE)	JUPITER Booster	NVIDIA Grace	NVIDIA Hopper	2000	3500
MELUXINA	LuxProvide (LU)	MeluXina CPU	AMD Epyc	-	2000	4000
		MeluXina GPU		NVIDIA A100	400	800
		MeluXina FPGA		Intel Stratix	600	1100
LEONARDO CINECA	CINECA (IT)	Leonardo DCGP	Intel Sapphire Rapids	-	2000	4000
		Leonardo Booster	Intel Xeon	NVIDIA A100	3500	4500
LUMI	CSC (FI)	LUMI-C	AMD Epyc	-	2000	4000
		LUMI-G		AMD Instinct	2500	4500

** resources displayed in node hours

❑ Other systems currently available include: MARENOSTRUM MN5 (BSC-ES), Discover (Sofia Tech Park – BG), VEGA (IZUM Maribor-SI), DEUCALION (FCT-PT)

CASE STUDY - LUMI

- Located at the CSC Data Centre in Kajaani, Finland.
- One of Europe's flagship EuroHPC supercomputers.
- Jointly owned by 11 European countries:
  - *Finland, Belgium, Czech Republic, Denmark, Estonia, Iceland, Netherlands, Norway, Poland, Sweden, and Switzerland.*
- Module-based software environment:
  - Easily load and switch between different compilers, libraries, and development tools using the module command.
- SLURM workload manager
  - providing a familiar environment for users from most UK HPC systems.
- Training and user support
  - LUMI consortium regularly delivers free webinars, workshops and hands-on training covering system access, application porting, debugging, profiling and performance optimisation.

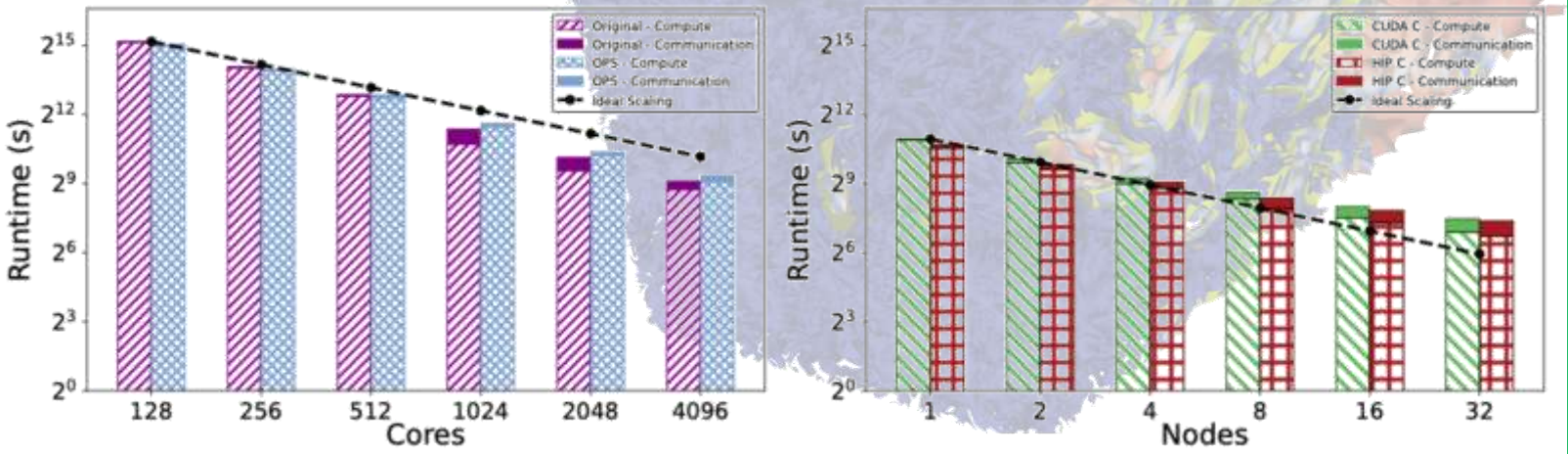
LUMI-C	LUMI-G
AMD EPYC 7763	AMD EPYC 7A53 + AMD MI250X
2 X 64 cores	1 X 64 cores + 4 X GPUs
256 GB/node	512 GB + 128 HBM GB/GPU
HPE Cray Slingshot-11 1 X 200 Gb/s	HPE Cray Slingshot 50 GB/s bi-direc./GPU
2048 X compute nodes	2978 X Compute nodes

My Experience on LUMI

- Successfully secured multiple EuroHPC allocations across two institutions.
- Utilized the LUMI system to develop and optimize the OPS-DSL Fortran backend targeting AMD GPUs.
- Ported, tested and benchmarked the SENGA-OPS combustion application.
- Observed good strong scaling on CPU and GPU systems.
- Weak Scaling shows consistently stable compute time, with slight increase in communication time at higher node count.

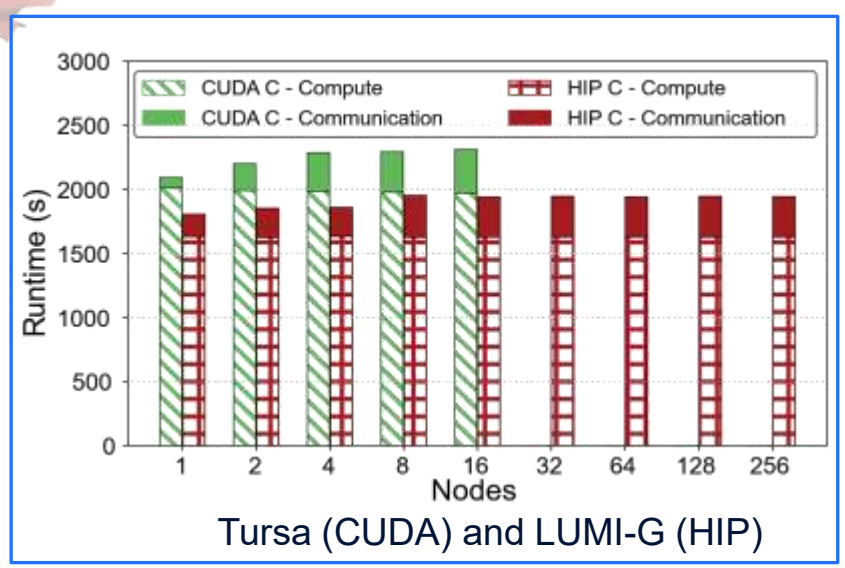
Institution	Access Type	System	Award **
University of Warwick	Development	LUMI-C	4,000
University of Warwick	Development	LUMI-G	4,500
University of Warwick	Benchmark	LUMI-C	2,000
University of Warwick	Development	LUMI-G	4,500
Queen's University Belfast	Development	LUMI-C	4,000
Queen's University Belfast	Development	LUMI-G	4,500

** resources displayed in node hours



LUMI-C (CPU) | Tursa (CUDA) and LUMI-G (HIP)

Strong Scaling



Tursa (CUDA) and LUMI-G (HIP)

Weak Scaling

How RSEs Can Help

- ❑ Identifying the most suitable EuroHPC access route.
- ❑ Selecting suitable system/partition (CPU vs GPU).
- ❑ Preparing competitive EuroHPC proposals.
- ❑ Estimate the compute requirements.
- ❑ Porting and optimizing scientific applications.
- ❑ Performance benchmarking and scalability studies.
- ❑ Getting started with LUMI and other EuroHPC systems.

Thank You

Any Questions?