EuroCC2
N-Ways to GPU Programming Bootcamp

Welcome

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VSC Research Center, TU Wien and EuroCC Austria

N-Ways to GPU Programming Bootcamp

Agenda

8 April	09:00–09:15	Welcome to the EuroCC 2 Bootcamp (Moderator)
	09:15–09:45	Introduction to GPU Computing (Lecture)
	09:45–10:15	Introduction to Nsight Systems (Lecture and Read-Only Lab)
	10:15–11:15	Accelerating Standard C++ and Fortran with GPUs (Lecture and Lab)
	11:15–11:30	*Break*
	11:30–13:00	Directive Based Programming with OpenACC or OpenMP on GPU (Lecture and Lab)
	13:00–14:00	*Lunch*
	14:00–15:45	CUDA C/Fortran Programming (Lecture and Lab)
	15:45–15:55	Description of the Code Challenge
	15:55–16:00	*Wrap Up and Q&A*

14:00 Group Photo

9 April	**09:00–12:00**	Code Challenge (porting a 2D regular-grid CFD simulation to GPU)
	09:00–09:30	Accelerating Python on GPUs (Lecture; optional)
	12:00–12:30	*Q&A about Code Challenge*

Zoom

Housekeeping

➤ All **hands-on exercises** will be done in groups, according to **preferred programming language**:

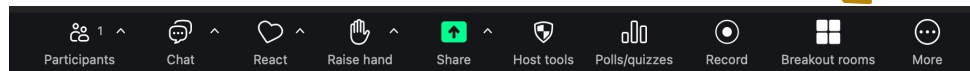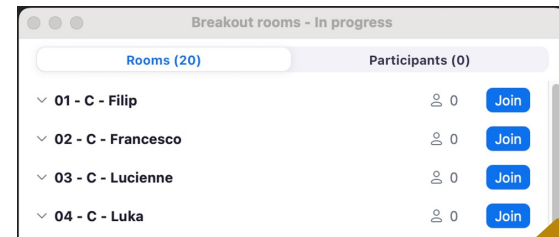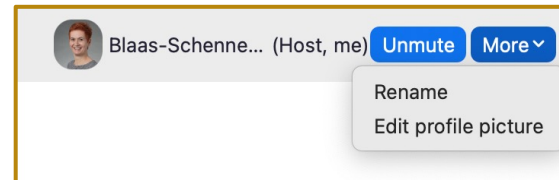   ➔ Please rename yourself in Zoom, so we can assign you to the right room:

      Your Name **(C)**   or   Your Name **(F)**

➤ **Teaching Assistants** please rename yourself:

      Your Name **(TA)**

➤ You can also **self-select a room**:

   ➔ click on the "**Breakout rooms**" button at the bottom of the Zoom window, then select a room with your preferred lang. or TA.

Blaas-Schenne... (Host, me) **Unmute** **More ⌄**

Rename
Edit profile picture

Breakout rooms - In progress

Rooms (20)   Participants (0)

01 - C - Filip   👤 0 **Join**
02 - C - Francesco   👤 0 **Join**
03 - C - Lucienne   👤 0 **Join**
04 - C - Luka   👤 0 **Join**

Participants 1 | Chat | React | Raise hand | Share | Host tools | Polls/quizzes | Record | Breakout rooms | More

Slack

Our main communication channel 🚀

#announcements - Keep an eye on this channel for all important information, messages, and links 🔊

#general - Use this channel to ask any general questions you may have ❓

#cluster-support - Use this channel to ask any questions you have on the cluster/issues you encounter 💻

#lab-questions - Ask any questions you have on the labs in this channel 🧪

#lecture-questions - Ask any questions you have on the lectures in this channel 🏫

#materials - Find all slides, supporting materials, and links to the recordings in this channel 📚

#introduce-yourself - Don't forget to tell us a bit about yourself and introduce yourself to the other participants! 👩‍🏫
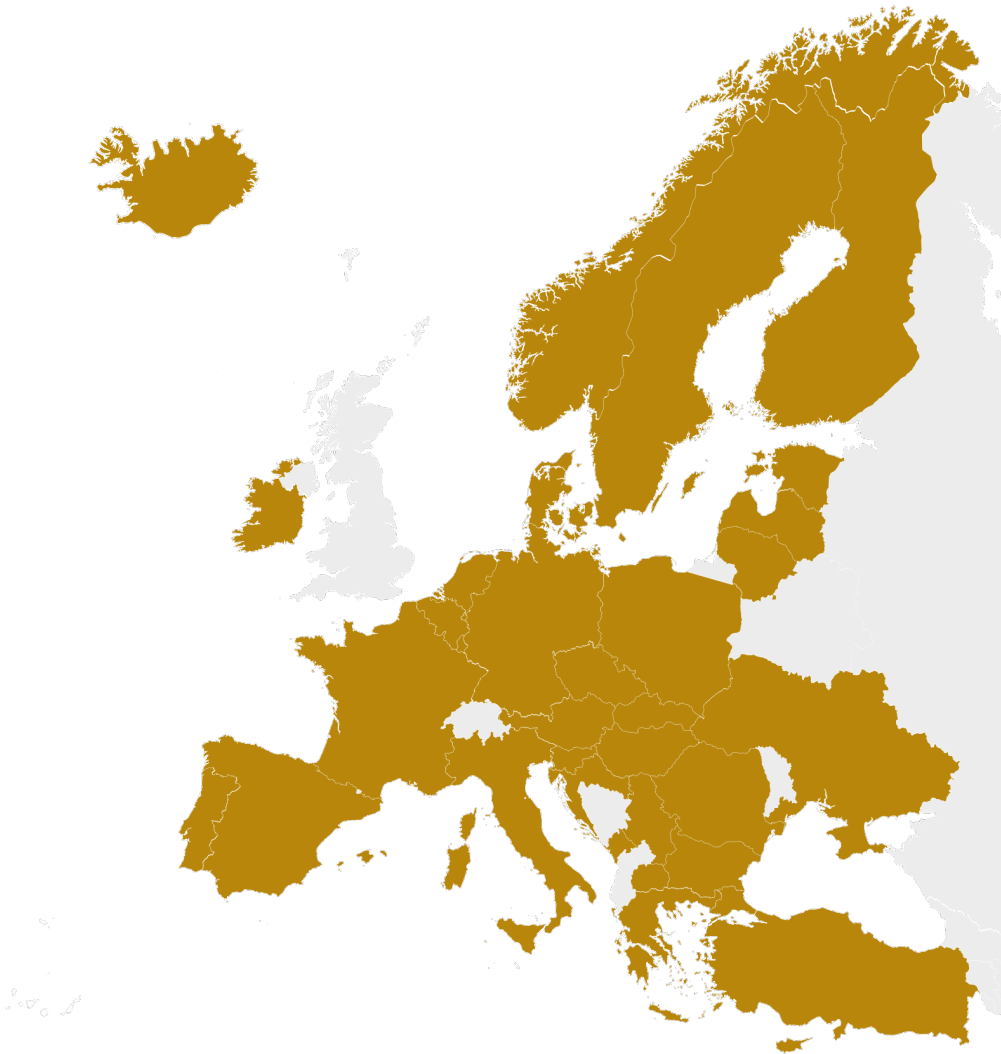
Please add after your **name (akronym of your institution, country)** - you'll see it will get crowded here 💯

Welcome

EuroCC & EuroCC 2

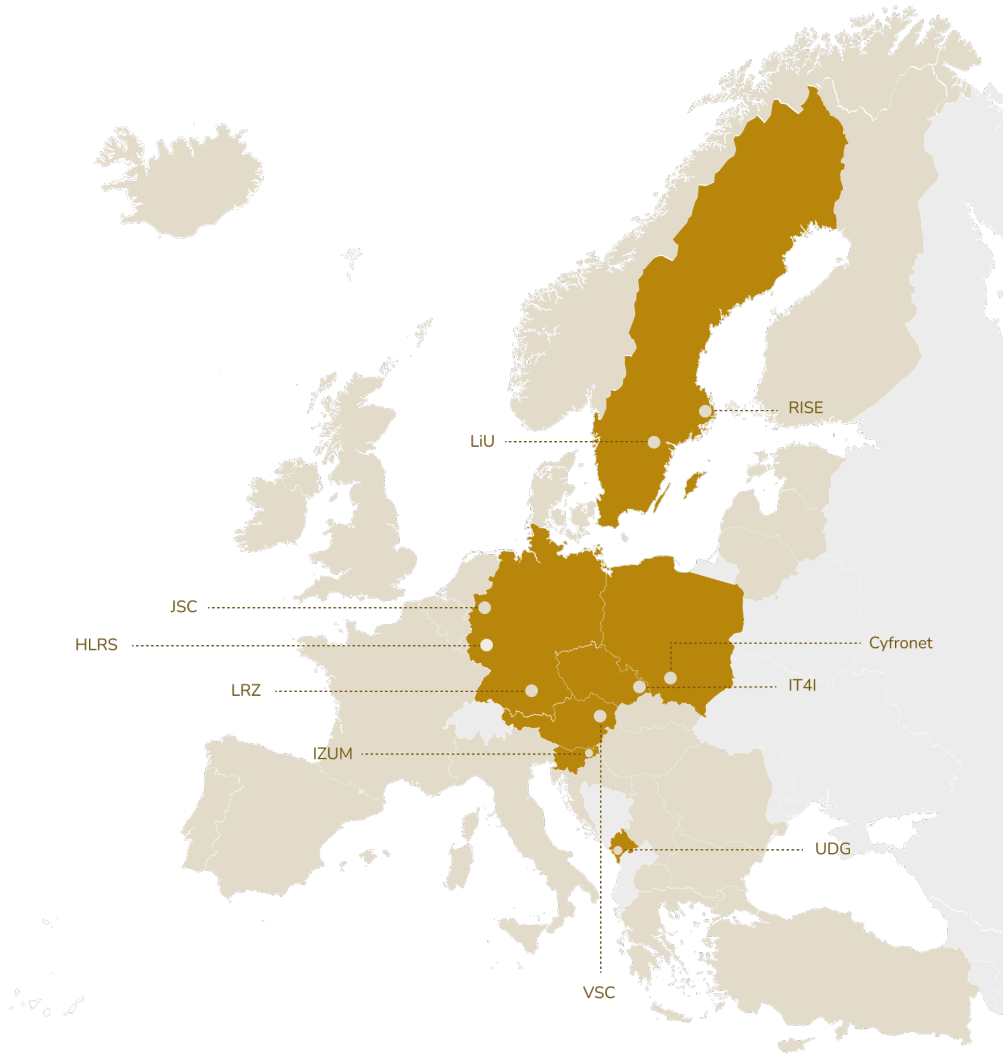- National Competence Centres (NCCs) for HPC/HPDA/AI

Welcome

EuroCC & EuroCC 2

- National Competence Centres (NCCs) for HPC/HPDA/AI

- N-Ways to GPU Programming

  - EuroCC Austria
  - EuroCC Czechia
  - EuroCC@GCS (Germany)
  - EuroCC Montenegro
  - EuroCC Poland
  - EuroCC Slovenia
  - ENCCS (Sweden)

  7 NCCs

  10 HPC centres

  + NVIDIA & OpenHackathons

Welcome

EuroCC & EuroCC 2

- National Competence Centres (NCCs) for HPC/HPDA/AI

- N-Ways to GPU Programming

  - EuroCC Austria
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  + NVIDIA & OpenHackathons

- 200+ participants from 20 countries
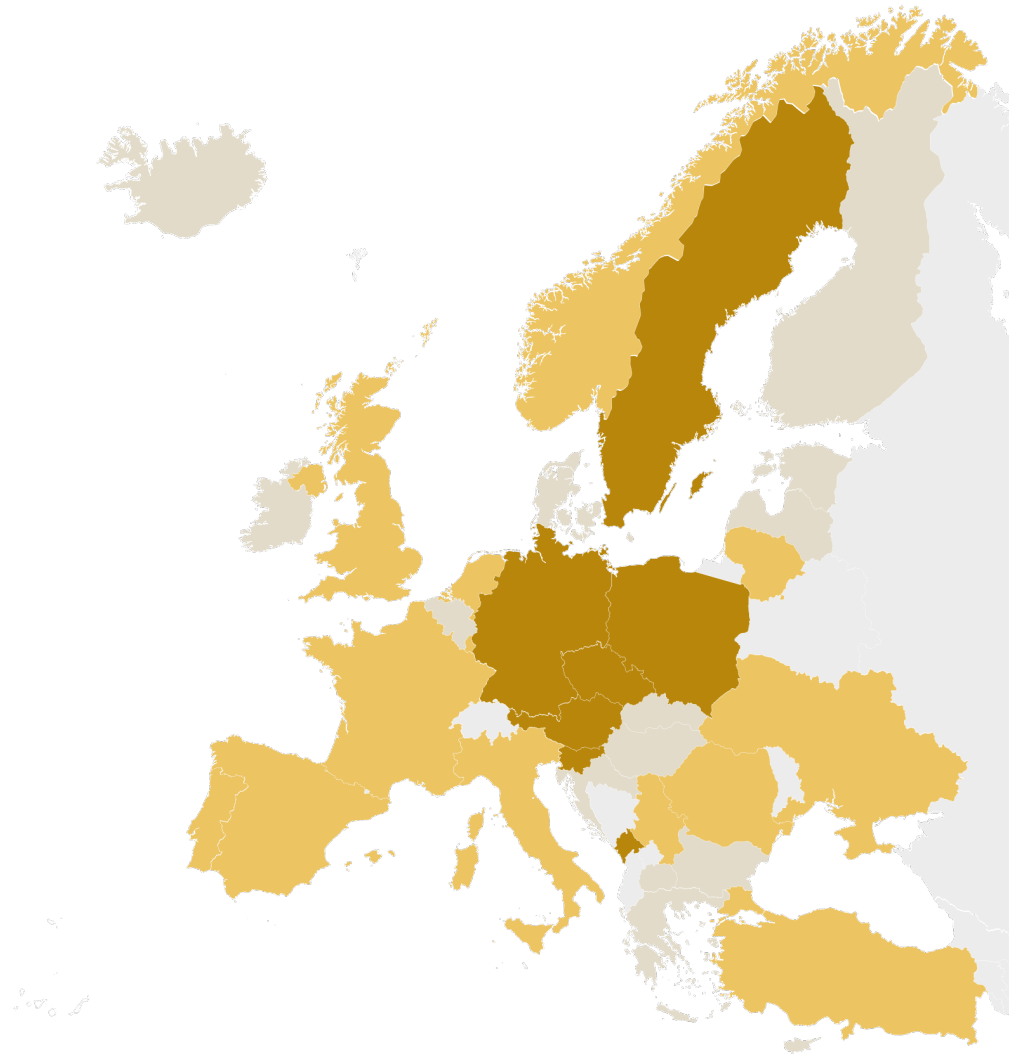
N-Ways to GPU Programming Bootcamp

Helping you to use GPUs

Paul Graham (NVIDIA; **instructor**)
Claudia Blaas-Schenner (VSC; **moderator**)

Teaching Assistants:

Ivan Vialov (VSC)
Moritz Siegel (VSC)
Siegfried Höfinger (VSC)

Filip Vaverka (IT4I)
Oskar Klimas (Cyfronet)

Lucienne Dettki (HLRS)
Maksym Deliyergiyev (HLRS)
Tobias Haas (HLRS)

Luis Cifuentes (JSC)
Luka Filipovic (UDG)

Momme Allalen (LRZ)
Saheed Bolarinwa (LRZ)
Volker Weinberg (LRZ)

Ashwin Mohanan (RISE)
Francesco Fiusco (RISE)
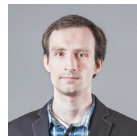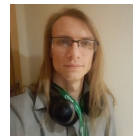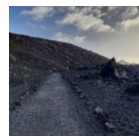

Paul

Claudia

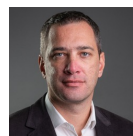Ivan

Moritz

Siegfried

Filip

Oskar

Lucienne

Maksym

Tobias

Luis

Luka

Momme

Saheed

Volker

Ashwin

Francesco

Bootcamps & Hackathons

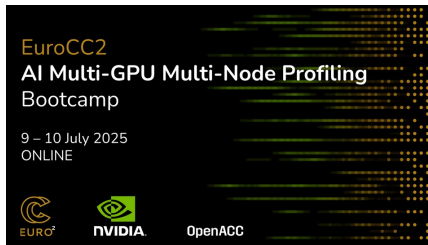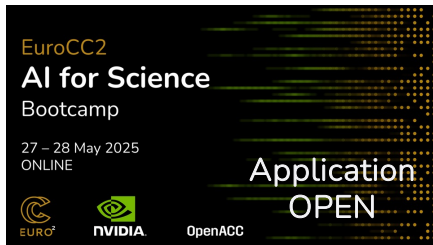**https://www.openhackathons.org**/s/upcoming-events

EuroCC2
AI for Science
Bootcamp
27 – 28 May 2025
ONLINE
Application OPEN

EuroCC2
AI Multi-GPU Multi-Node Profiling
Bootcamp
9 – 10 July 2025
ONLINE

EuroCC2
AI Hackathon
14 – 23 October 2025
ONLINE

EuroCC2
N-Ways to GPU Programming
Bootcamp
8 – 9 April 2025
ONLINE

EuroCC2
Multi-GPU Programming
Bootcamp
17 – 18 June 2025
ONLINE
Application OPEN

https://vsc.ac.at/training

https://events.plgrid.pl/event/78/

EuroHPC Supercomputers

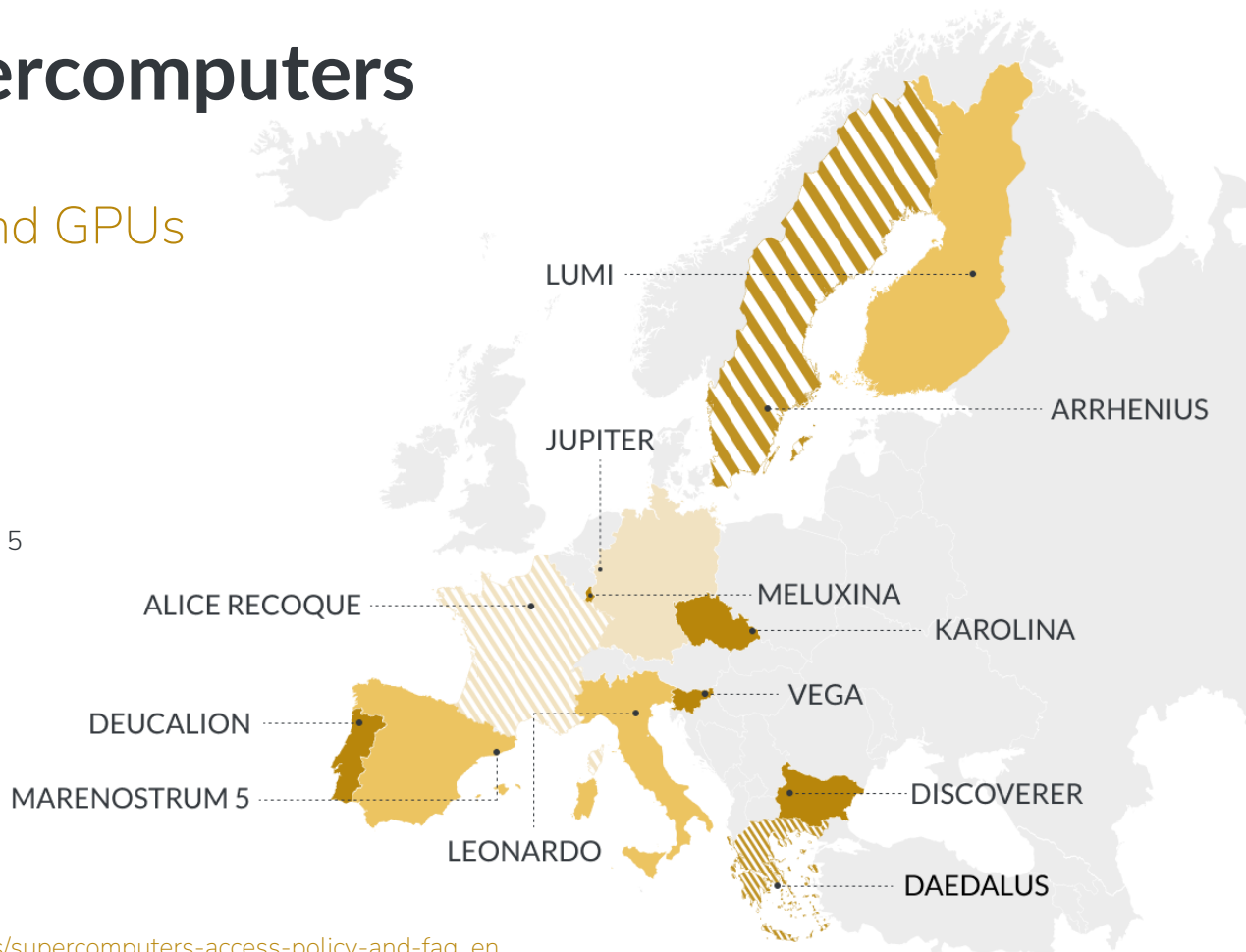## Get access to CPUs and GPUs

1(+1) exascale systems
JUPITER, (ALICE RECOQUE)
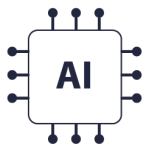
3 pre-exascale systems
LUMI, LEONARDO, MARENOSTRUM 5

5(+2) petascale systems
DEUCALION, DISCOVERER,
MELUXINA, KAROLINA,
VEGA, (DAEDALUS),
(ARRHENIUS)

LUMI

ARRHENIUS

JUPITER

ALICE RECOQUE

MELUXINA

KAROLINA

VEGA

DEUCALION

MARENOSTRUM 5

LEONARDO

DISCOVERER

DAEDALUS

https://eurohpc-ju.europa.eu/supercomputers/supercomputers-access-policy-and-faq_en

EuroHPC Key Facts & Figures

13
AI Factories

12
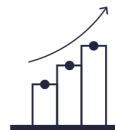Supercomputers

10
Quantum Computers

55
R & I Projects

35
Participating States

7
Billion EUR Total Budget

EuroCC Austria
National Competence Centre for Supercomputing, Big Data and AI

Consulting & project support

- Consulting & support
- Free Proof of Concept (PoC)
- Securing state funding
- Help with finding project partners & experts
- Business plan development

Training with VSC

- Parallel programming
- GPU programming
- AI / Machine learning
- Data analytics
- Python, C++, MPI, OpenMP
- Best practices for better code performance

HPC infrastructure

Access to supercomputers, including help with the application process and programming support:

- Vienna Scientific Cluster
- MUSICA, Leonardo
- Other EuroHPC Systems

EURO AUSTRIA

STAY IN TOUCH

eurocc-austria.at

vsc.ac.at

THANK YOU

EURO²

EuroHPC
Joint Undertaking