EURO

Pavlos Sermpezis

"High Performance Computing (HPC) technologies" seminar

Aristotle University of Thessaloniki - April 5, 2023

EuroCC@Greece - at a glance

- **EuroCC**
  - European project to establish **National Competence Centres (NCCs)** …
  - … on **High Performance Computing (HPC)** …
  - … in **33 European countries**
  - Started in **2020**
  - Funded by EuroHPC JU & GSRI

- **EuroCC@Greece** is the **NCC** for **HPC** in **Greece**

EuroCC@Greece - at a glance

- **Members**
  - GRNET – National Infrastructures for Research and Technology *(coordinator)*
  - National Center for Scientific Research “Demokritos”
  - Foundation for Research and Technology – Hellas (FORTH)
  - Institute of Communication and Computer Systems of NTUA
  - Aristotle University of Thessaloniki

The role of EuroCC@Greece

- Mission & Role of the National Competence Centre (NCC)
  - **Point of contact** and coordination on a national level for HPC
  - **Cover needs of HPC users**
    - access to resources, technological consultancy, training courses, networking, etc.
  - Set up a cross-European network of NCCs

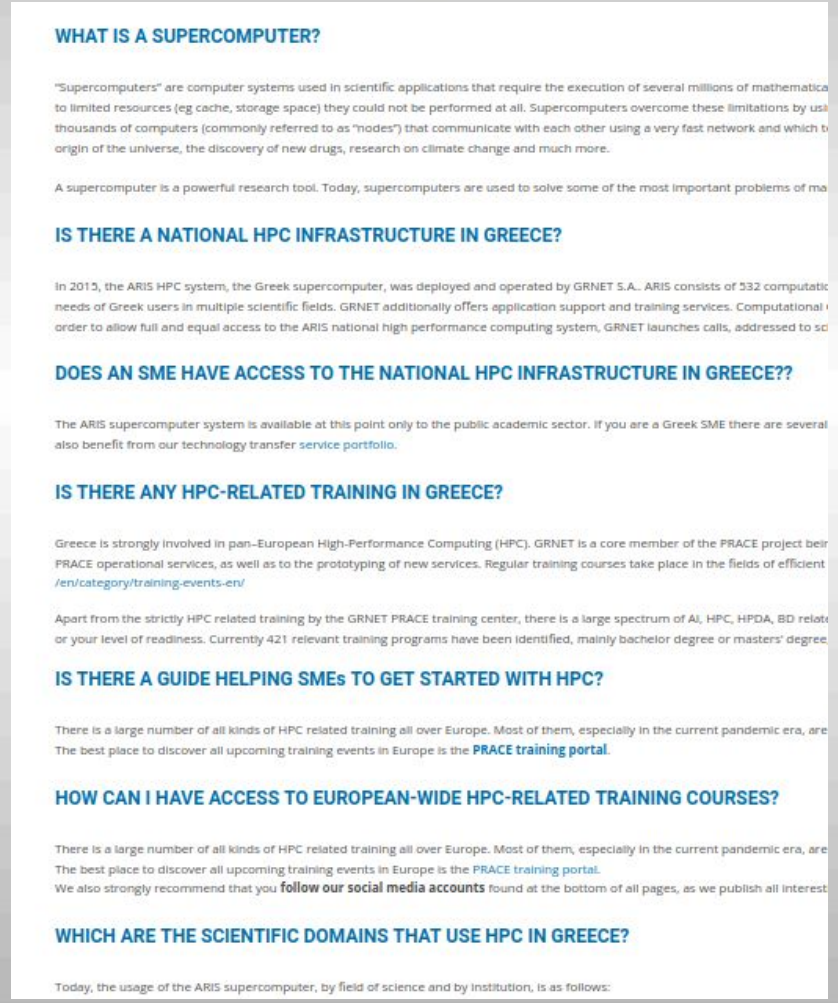
- Users
  - **Research & academic institutions**
    - e.g., to advance competitiveness
  - **Public administration**
    - e.g., to improve effectiveness
  - **Industry**
    - e.g., to promote innovation

“Services” of EuroCC@Greece

- Learn about HPC
- Access to training resources (courses, videos, tools, code, etc.)
- Access to infrastructure
- Industrial innovation (tech transfer, funding opportunities, internships)
- Mapping of competences
- HPC “marketplace”
- Information (news, newsletter, etc.)
- Event organization

Training

- Introduction to HPC



WHAT IS A SUPERCOMPUTER?

"Supercomputers" are computer systems used in scientific applications that require the execution of several millions of mathematica to limited resources (eg cache, storage space) they could not be performed at all. Supercomputers overcome these limitations by usi thousands of computers (commonly referred to as "nodes") that communicate with each other using a very fast network and which t origin of the universe, the discovery of new drugs, research on climate change and much more.

A supercomputer is a powerful research tool. Today, supercomputers are used to solve some of the most important problems of ma

IS THERE A NATIONAL HPC INFRASTRUCTURE IN GREECE?

In 2015, the ARIS HPC system, the Greek supercomputer, was deployed and operated by GRNET S.A.. ARIS consists of 532 computatic needs of Greek users in multiple scientific fields. GRNET additionally offers application support and training services. Computational order to allow full and equal access to the ARIS national high performance computing system, GRNET launches calls, addressed to sc

DOES AN SME HAVE ACCESS TO THE NATIONAL HPC INFRASTRUCTURE IN GREECE??

The ARIS supercomputer system is available at this point only to the public academic sector. If you are a Greek SME there are several also benefit from our technology transfer service portfolio.

IS THERE ANY HPC-RELATED TRAINING IN GREECE?

Greece is strongly involved in pan-European High-Performance Computing (HPC). GRNET is a core member of the PRACE project beir PRACE operational services, as well as to the prototyping of new services. Regular training courses take place in the fields of efficient /en/category/training-events-en/

Apart from the strictly HPC related training by the GRNET PRACE training center, there is a large spectrum of AI, HPC, HPDA, BD relate or your level of readiness. Currently 421 relevant training programs have been identified, mainly bachelor degree or masters' degree

IS THERE A GUIDE HELPING SMEs TO GET STARTED WITH HPC?

There is a large number of all kinds of HPC related training all over Europe. Most of them, especially in the current pandemic era, are The best place to discover all upcoming training events in Europe is the **PRACE training portal**.

HOW CAN I HAVE ACCESS TO EUROPEAN-WIDE HPC-RELATED TRAINING COURSES?

There is a large number of all kinds of HPC related training all over Europe. Most of them, especially in the current pandemic era, are The best place to discover all upcoming training events in Europe is the PRACE training portal.
We also strongly recommend that you **follow our social media accounts** found at the bottom of all pages, as we publish all interest

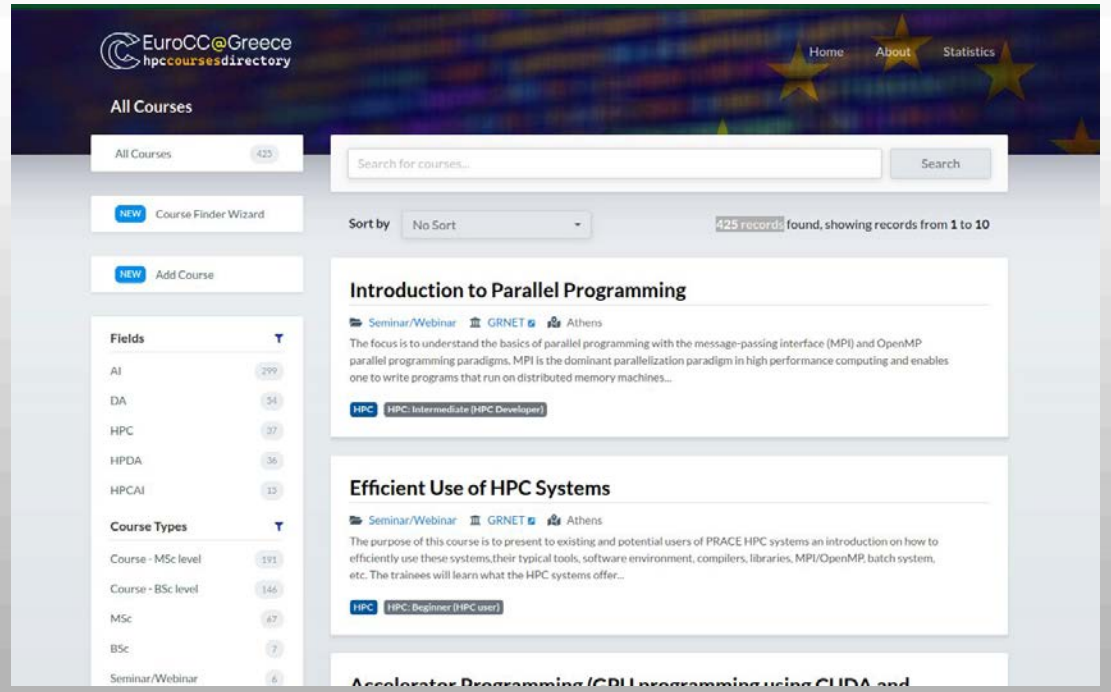
WHICH ARE THE SCIENTIFIC DOMAINS THAT USE HPC IN GREECE?

Today, the usage of the ARIS supercomputer, by field of science and by institution, is as follows:

Training

- HPC PRACE training center
  - seminars: Parallel Programming, GPU programming, CUDA, biomolecular modeling in HPC, ML/AI in HPC, Meteorological and climate modeling, etc.

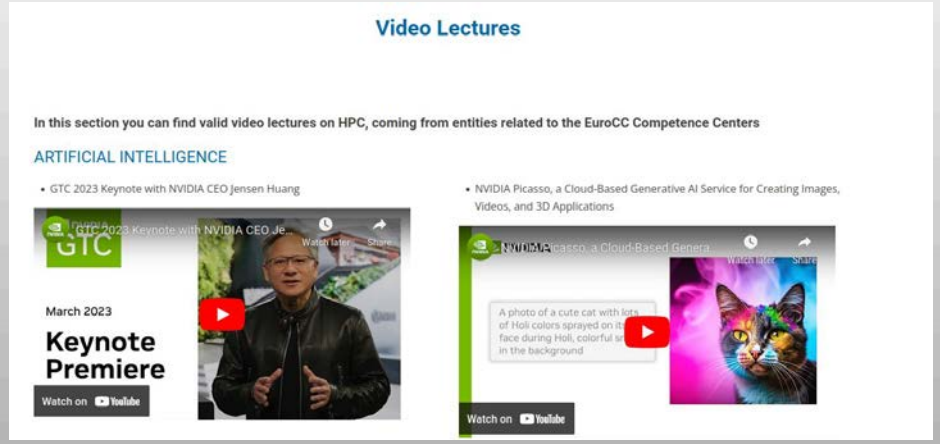
- Repository of HPC training courses
  - http://hpc-courses.chemeng.ntua.gr/
  - 425 courses (BSc, MSc, seminars, summer schools, etc.)



Training

- Repository of video lectures (YouTube)
  - Topics: HPC, AI, Biomolecular, CFD, Computational chemistry, Energy, Material sciences, Seismology

- Links to external repositories of training resources



Training

- Several training events every year

EUMaster4HPC

- Applications are open!!! next deadline 14 April

Access to HPC resources

- HPC infrastructures in Greece
  - GRNET - “ARIS”
  - AUTH - “Aristotelis”
  - ICS-FORTH
  - Demokritos

- External infrastructure
  - MELUXINA
  - Leonardo

contact us!!

HPC marketplace

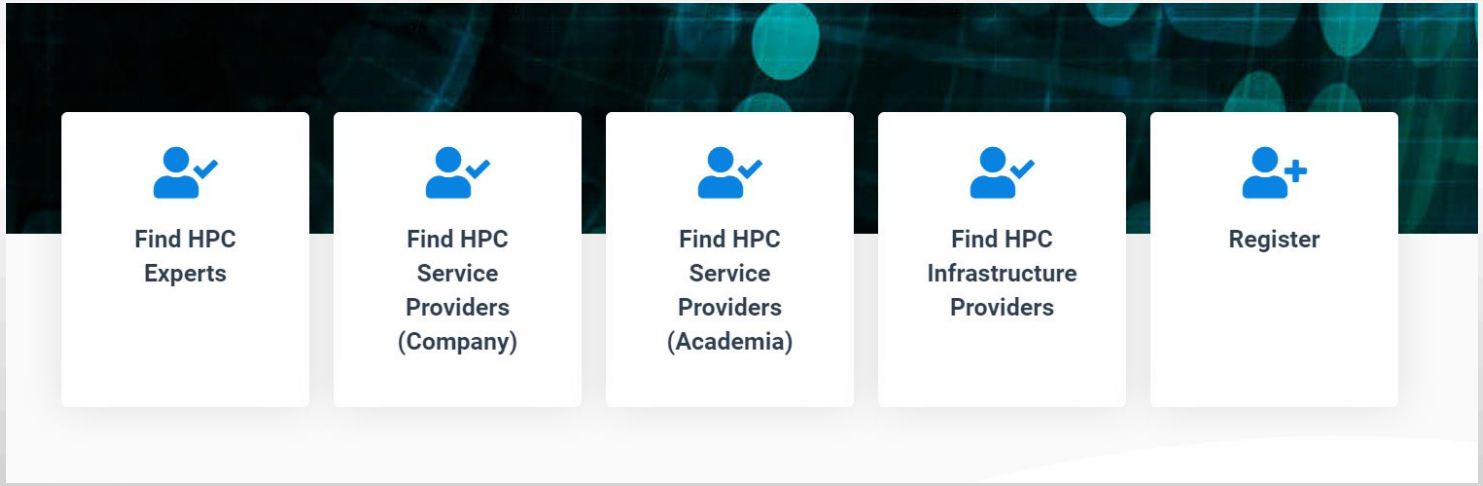
- **HPC marketplace**: database (or “yellow pages”) of HPC providers in Greece

- **“HPC providers”**
  - HPC service providers (industry & academia)
  - HPC infrastructure providers
  - HPC experts (independent professionals)
  - … that provide any type of HPC and/or Big Data and/or AI services

https://hub.eurocc-greece.gr/

HPC marketplace

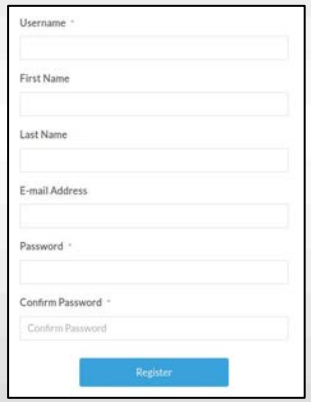
- Can be seen as a marketplace…
  - **Providers** of HPC services … that **register** their organizations & services
  - **Users** of HPC services … that **search** for a provider to cover their needs

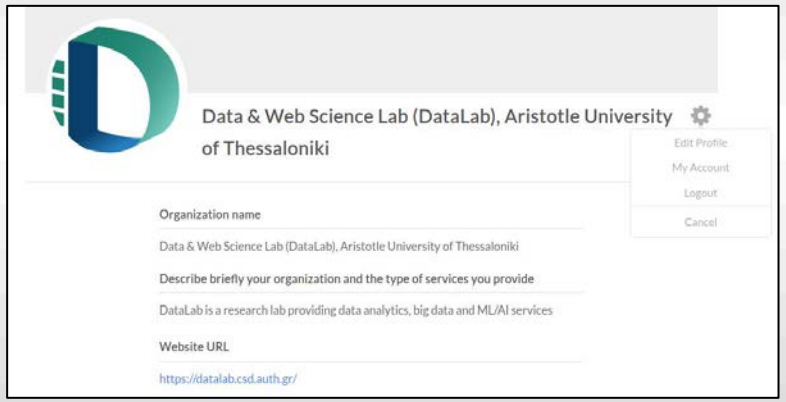


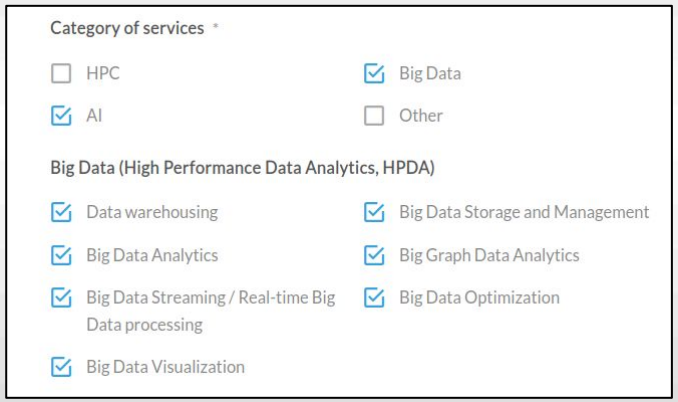
https://hub.eurocc-greece.gr/

HPC marketplace

- Simple registration process



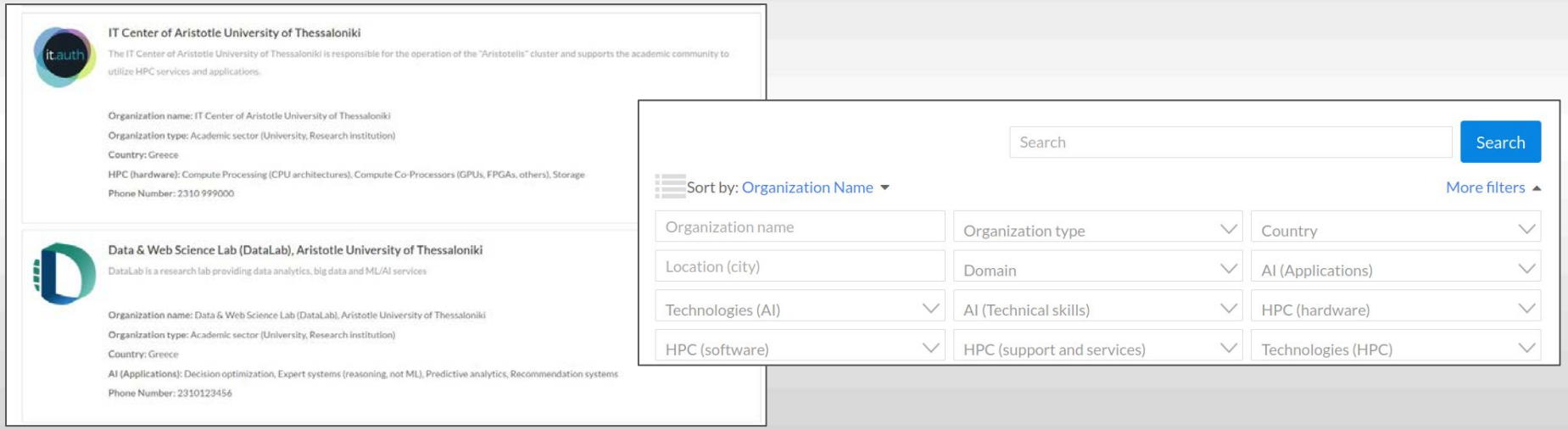




https://hub.eurocc-greece.gr/

HPC marketplace

- Filtered search



https://hub.eurocc-greece.gr/

Tech transfer & Industry hub

- **Services to industry**
  - Access to HPC infrastructure
  - Access to funding
  - Tech transfer services
  - Consultation in HPC, AI and HPDA technologies
  - Mentoring on business aspects
  - Networking
  - Facilitation of industrial internships

Tech transfer & Industry hub

- Support of the submission of 10 proposals (15 SMEs) in ff4eurohpc
- Support the implementation of 4 projects (5 SMEs)
- Contacts of various types with 27 SMEs
- Handbook for HPC adoption by SMEs
- Industrial Internship Program
- Support of 100+ academic projects on the National HPC infrastruture

Where you can find us

Web: https://eurocc-greece.gr/

Twitter: @EuroCC_Greece (https://twitter.com/EuroCC_Greece)

LinkedIn: eurocc-greece (https://www.linkedin.com/company/eurocc-greece/)

YouTube: @euroccgreece9501 (https://www.youtube.com/@euroccgreece9501)

Email: contact@eurocc-greece.gr

Newsletter: https://eurocc-greece.gr/newsletter/

Thanks!

Don’t forget to…

@all: visit the website
& register to the newsletter

@students: check the training material
& EUMaster4HPC

@industry: register at the marketplace
& contact us for access to resources

EuroHPC
Joint Undertaking

This project has received funding from the European High-Performance Computing Joint Undertaking (JU) under grant agreement No 951732. The JU receives support from the European Union’s Horizon 2020 research and innovation programme and Germany, Bulgaria, Austria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Poland, Portugal, Romania, Slovenia, Spain, Sweden, United Kingdom, France, Netherlands, Belgium, Luxembourg, Slovakia, Norway, Switzerland, Turkey, Republic of North Macedonia, Iceland, Montenegro