



EuroHPC
User Days

Dublin Ireland
22→24
September 2026



Europe's Gateway to Supercomputing Training

Dr Daniel Opalka

Head of Research & Innovation Unit - EuroHPC JU

Getting to know EuroHPC JU

- The European High Performance Computing Joint Undertaking (EuroHPC JU) is a legal and funding entity created in 2018 and based in Luxembourg.
- The EuroHPC JU enables the European Union and participating countries to coordinate efforts and pool resources.
- Its goal is to make Europe a global leader in supercomputing.
- It strengthens Europe's scientific excellence and industrial competitiveness.
- It supports the digital transformation of the European economy.
- It contributes to ensuring Europe's technological sovereignty.
- It was created in 2018, reviewed in 2021 by Council Regulation (EU) 2021/1173, and amended in July 2024 by Council Regulation (EU) 2024/1732 and Council Regulation (EU) 2026/150.

Our Mission : “The European way for the Digital Decade”

NINE PILLARS OF EUROHPC JU



EuroHPC
Joint Undertaking

New!

Quantum Technologies



AI Gigafactories

New!

Technology



AI Factories

Skills and Usage



Infrastructure

Federation and
Hyper connectivity



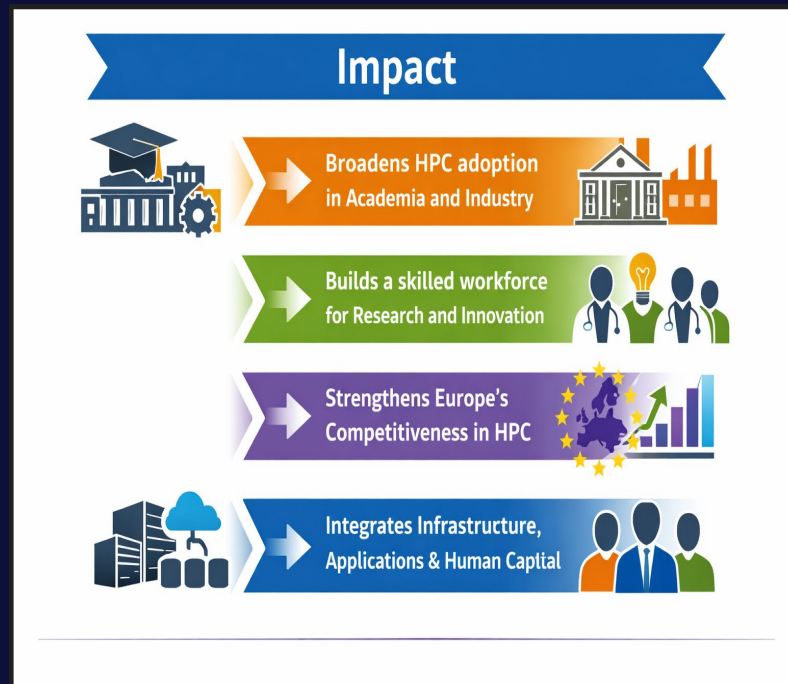
Applications

International
Cooperation



EuroHPC Skills & Usage Pillar

- The **EuroHPC Joint Undertaking (EuroHPC JU)** not only invests in world-class supercomputing infrastructure but also emphasizes the **development of skills and education** to ensure these systems are fully utilized across Europe.
- To achieve this, EuroHPC JU has launched a series of **training and education initiatives** designed to strengthen HPC capabilities, foster innovation, and build a highly skilled European workforce.



Skills & Usage Pillar: strongly integrates with academies by:

EuroHPC JU's initiatives:

- Supporting **national academic competence hubs** (NCCs) to deliver training and services to researchers;
- Funding **formal educational programmes** like the EUMaster4HPC;
- Building **Europe-wide training frameworks** with academic leadership (EVITA);
- Enabling **academic training events** such as summer schools under open calls (HPC SPECTRA, EuroIHPCSS).



DG CONNECT managed projects:

- **ACHIEVE** – Accelerating HPC & AI skill development across Europe
- **LEADS 2030** – Developing leadership and digital competencies for the HPC workforce of the future
- **DigiQ** – Promoting digital and quantum literacy through training programmes for academia and industry
- **Quantum Virtual Academy** – Supporting the coordination of quantum education and skills development across Europe, from school education to professional upskilling.

Panel speakers:

Vilma Djala

EDUCATION LEAD
ACHIEVE project



Maria-Ribera Sancho

PROFESSOR, HEAD OF EDUCATION & TRAINING & PROJECT COORDINATOR
UPC, Barcelona Supercomputing Centre, EVITA Project



Marko Rancic

COORDINATOR
EUMaster4HPC



Julie Byrne

ASSISTANT PROFESSOR
Trinity College Dublin & LEADS*2030



Aurél Gábris

DEPUTY-HEAD OF DEPARTMENT OF PHYSICS & WORK PACKAGE LEADER
Czech Technical University in Prague & DigiQ Masters Programme



Thank you!

For more information, feel free to visit our website and social media:



eurohpc-ju.europa.eu



[@euroHPC_JU](https://twitter.com/euroHPC_JU)



[eurohpc-ju](https://www.linkedin.com/company/eurohpc-ju)



[@eurohpc-ju](https://www.youtube.com/@eurohpc-ju)



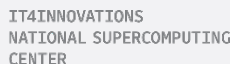
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Maria Ribera Sancho
Project Coordinator

8 Consortium Members





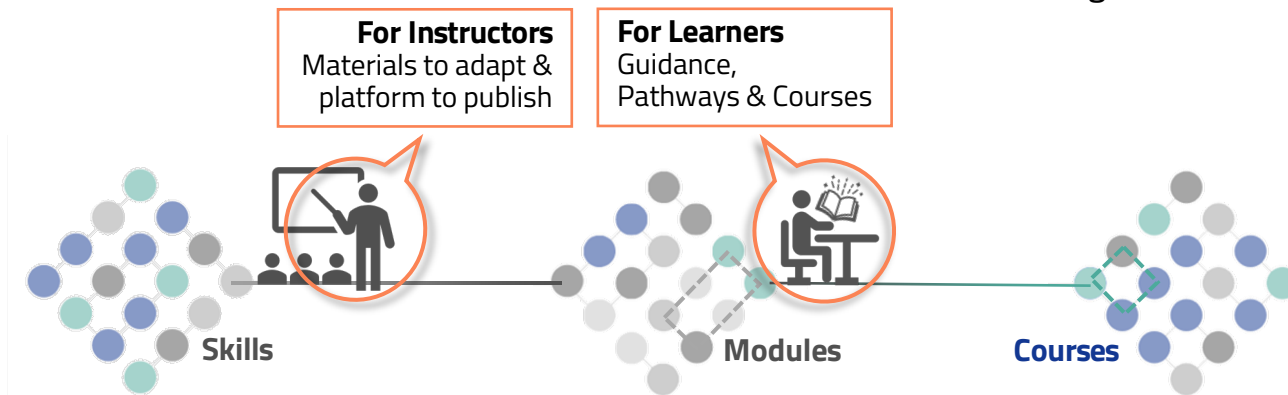
EuroHPC Virtual Training Academy

Main objective

Build a framework for high-quality HPC education & training in Europe, for industry, academia, & public administration

Main contribution

Harmonisation of HPC training in a **Competence & Qualification Framework** supported by broad access to new and existing curricular materials

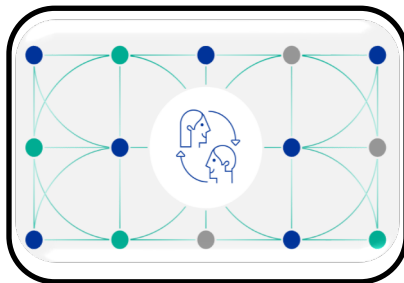




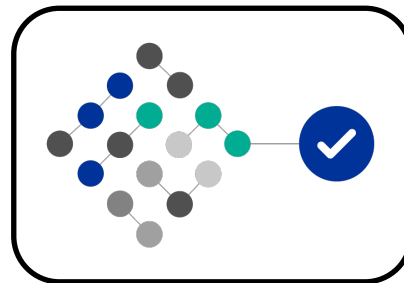
EVITA Project Action Pillars



@evitahpc



Competence &
Qualification Framework



Modular Training
Materials



Certification Scheme



Online Training Platform



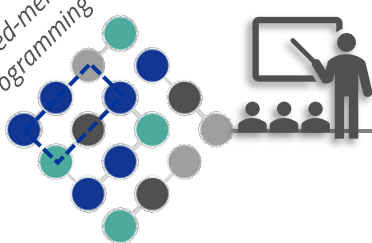
Competence & Qualification Framework (CQF)

Learning Pathway: Parallel Programming on Heterogeneous Systems

Prerequisite:
Sequential
programming

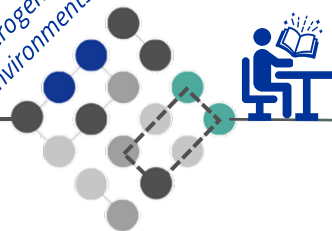


Course:
Shared-memory parallel
programming



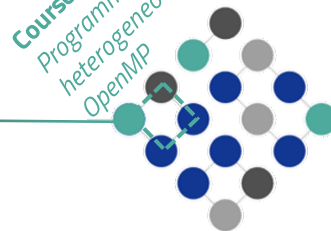
Skill: Parallel algorithms
Module: Shared memory applications using OpenMP
Learning outcome: Use OpenMP to program applications

Course:
Heterogeneous system
environments



Skill: Hardware Architectures
Module: Heterogeneous systems concepts
Learning outcome: Describe the structure of an Heterogeneous System

Course:
Programming
heterogeneous systems with
OpenMP



Professional Profile:
HPC Heterogeneous
Parallel Programmer



Online
Exams for
Certification



Modular Training Materials for HPC

- Common template for **1-4 hr** modules
- Contain skill, outcome, hands-on exercises, assessment, instructor guide, initial setup
- Funded through **3 open calls**
- Proposals evaluated by **external experts**



EVITA
EuroHPC Virtual Training Academy

High Performance
Data Analytics in
Python

Q Search

SOFTWARE SETUP

Setting Up Programming
Environment

EPISODES

Motivation

Efficient Array Computing

Efficient Array Computing (in
Markdown)

Efficient Array Computing (in
PDF)

Quiz

Your title here

Array operations and manipulations

All the familiar arithmetic operators in NumPy are applied elementwise:

```
# 1D example

import numpy as np
a = np.array([1, 2, 3])
b = np.array([4, 5, 6])

print(f"a + b = {a + b}\n a / b = {a / b}")
```

a + b = [5 7 9]
a / b = [0.25 0.4 0.5]

1	2	3
---	---	---

 +

4	5	6
---	---	---

 =

5	7	9
---	---	---

1	2	3
---	---	---

 /

4	5	6
---	---	---

 =

0.25	0.4	0.5
------	-----	-----

Exercise

Run the code below to get familiar with indexing in a 2D example.

```
# 2D example

import numpy as np
a = np.array([[1, 2, 3], [4, 5, 6]])
b = np.array([[10, 10, 10], [10, 10, 10]])

print(a+b)
```

ON THIS PAGE

Why can Python be slow?

NumPy

Arrays

Creating NumPy arrays

Array operations and manipulations

Array indexing

I/O with NumPy

Random numbers

Pandas

Data analysis workflow

Missing/invalid data

Scipy

Exercises

European Master For High Performance Computing



EUMaster4HPC

Prof. Dr. Marko Rančić
University of Luxembourg
Principal investigator



Funded by
the European Union



EuroHPC
Joint Undertaking

This project has received funding from the European High-Performance Computing Joint Undertaking under grant agreement No 101256784.

This presentation reflects only the author's view and EuroHPC Joint Undertaking is not responsible for any use that may be made of the information it contains.

22.09.2026





23

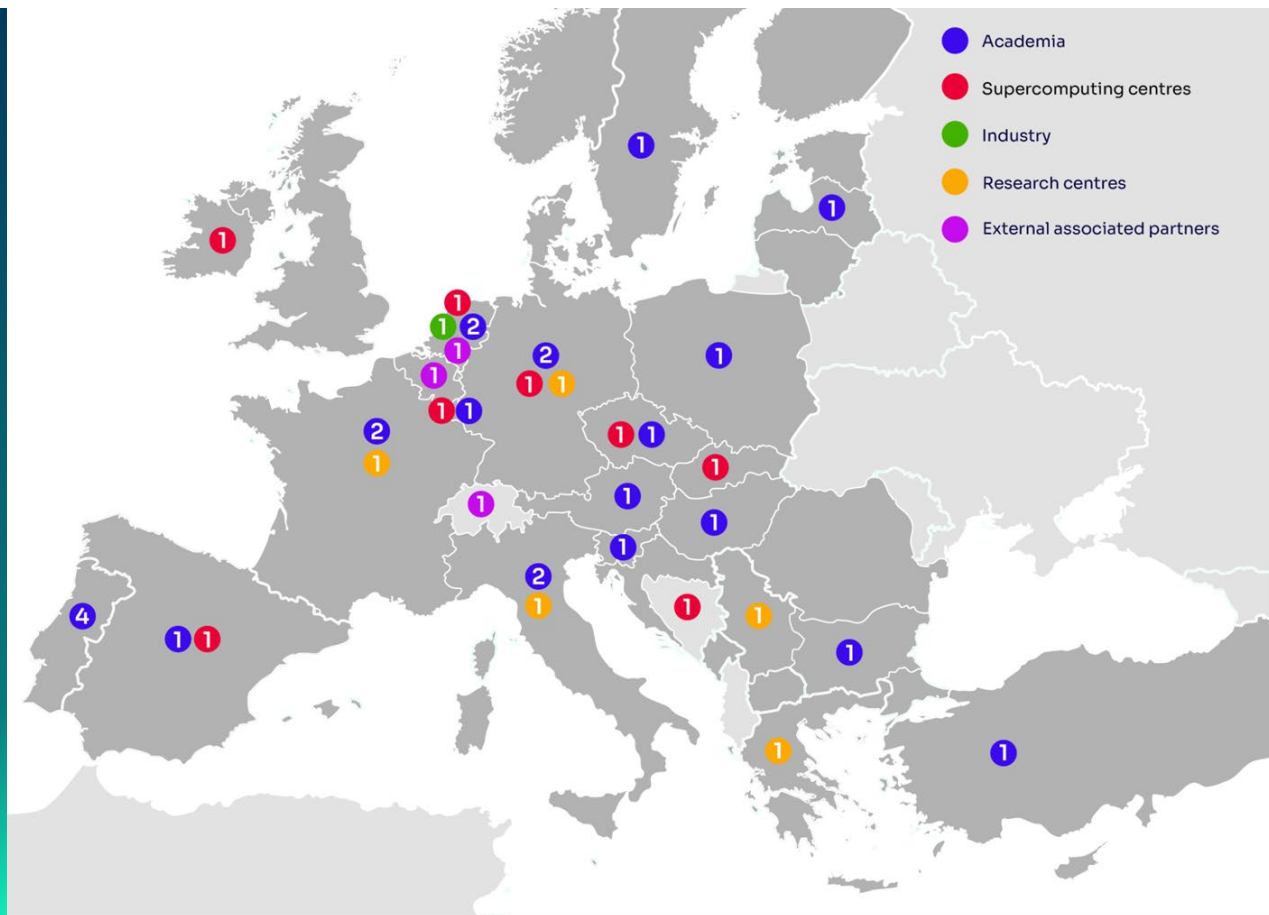
Countries

100+

Partners from
Academia, Industry,
SME's, SCC, Research
centres

158

Students recruited

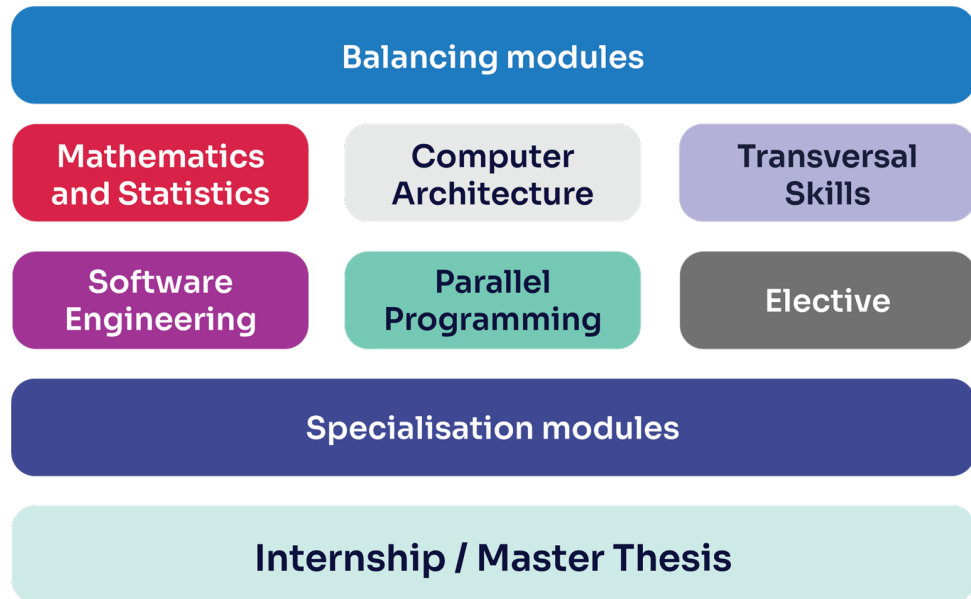




Calls inviting universities to apply to become
awarding universities will be launched
throughout the project lifecycle.

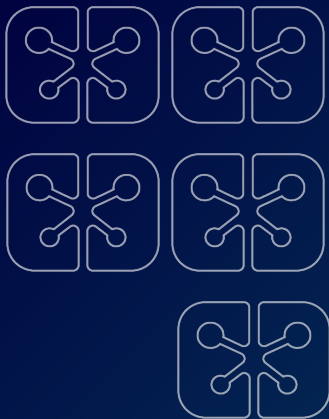


The EUMaster4HPC Curriculum



6 Specialisations

- Numerical and Data Specialist for Science Domains
- Performance Analyst and Advisor
- System Architect
- System Development and Support
- Artificial Intelligence
- Quantum Computing



EUMaster4HPC



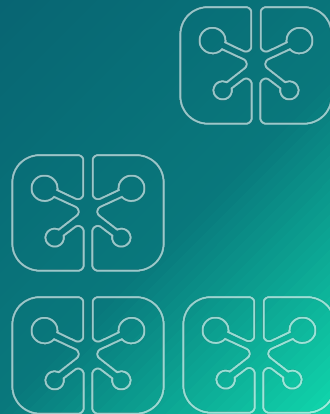
Learn more and apply
on eumaster4hpc.eu

Follow the project on Social Media



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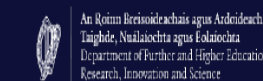


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ACHIEVE

Advanced Cloud and High-Performance Computing
Education for a Valiant Europe

Vilma Djala — Project Manager, ACHIEVE 28DIGITAL (EIT Digital) ·
Grant 101190015

Parallel session: Europe's Gateway to Supercomputing Training · Tuesday 22
September, 16:30–18:00



Europe is scaling compute faster than capability

The bottleneck is no longer FLOPS. It is engineers who can deploy HPC into real operational environments.

What ACHIEVE is

A pan-European education programme for cloud, networking infrastructure and HPC

FUNDING

Digital Europe
Programme DIGITAL-
2023-SKILLS-05 Grant
101190015

COORDINATOR

28DIGITAL (EIT Digital)

CONSORTIUM

17 partners 8
universities 6 countries

MANDATE

Quality and volume of
EU higher education in
HPC and cloud
infrastructure

Two entry points

Full degrees for new talent, modular certification for people already in post

MASTER'S PROGRAMMES

Cloud and Networking Infrastructure and HPC
(CNIHPC)

Double degree · ISCED 7 · 120 ECTS · entry and exit
university in two different countries

Master in HPC Engineering

Politecnico di Milano — new programme created inside
ACHIEVE

SELF-STANDING LEARNING MODULES

Advanced Cloud & High-Performance Computing

Self-paced online modules on HPC, cloud and networking
infrastructure

Each module taken independently · certificate of
completion on assessment

Hosted on the ACHIEVE Education learning platform

Applied by design

Industry in the curriculum, entrepreneurship across every pathway

- Curriculum input from AWS and Infineon Technologies
- Internship embedded in the master's thesis, in a real operational setting
- Transversal Innovation & Entrepreneurship minor on every pathway
- Open expert article series from POLIMI, KTH, Novi Sad and Infineon

The consortium

17 partners across higher education, industry and research

HIGHER EDUCATION

Aalto University · KTH Royal Institute of Technology · Politecnico di Milano · University of Trento · University of Rennes · Babeş-Bolyai University · University of Novi Sad · Middle East Technical University

INDUSTRY & RESEARCH

Amazon Web Services · Infineon Technologies · RISE Research Institutes of Sweden · TÜBİTAK · ODTÜ Teknokent · Techvalley Management · Evolutionary Archetypes Consulting

COORDINATION

28DIGITAL (EIT Digital) · 28DIGITAL Spain



Why this matters

Sovereign compute is only sovereign if Europe has the people to run it

- The gap is structural. Skills, not FLOPS, now constrain Europe's compute investment
- AI and HPC have converged. AI Factories need schedulers, accelerators and cloud in one head
- One pipeline, two speeds. Modules reskill people in post; master's build the next generation
- Written with industry. AWS and Infineon shape the curriculum for deployment-readiness

Europe funds the machines. Europe's Gateway to Supercomputing Training is about the capability to use them.

Where ACHIEVE sits in the gateway

EuroHPC
investment

Infrastructure & AI
Factories deployed

Operational skills
gap

ACHIEVE degrees
& modules

Workforce that can
run it

- Two doors into the same gateway: a full double degree, and single certifiable modules
- Complementary to EuMaster4HPC and the national competence centres, not duplicative
- Aligned with the Digital Europe Programme and the Pact for Skills advanced-digital-skills objectives

Thank you

Two things you can do this week

Take a module. Self-standing online modules in Advanced Cloud & HPC — each independently certified.

Send us candidates. CNIHPC double-degree master's, with scholarships — Cycle 3 applications open autumn 2026.

28digital.eu/eu-collaborations/achieve

Vilma Djala · Project Manager, ACHIEVE · 28DIGITAL

Funded by the European Union under the Digital Europe Programme, grant agreement
101190015





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DigiQ and European Quantum Academy

Pan-European efforts for quantum education, workforce training,
and ecosystem



Aurél Gábris



DIGITALLY ENHANCED QUANTUM
TECHNOLOGY MASTER

EuroHPC and Quantum

Capacity building in academia and industry

Core Challenge: Bridging theory to massive hybrid workflows

Two-way skills gap

Academic research

- Develop new algorithmic primitives
- Assess and analyse scaling and efficiency
- Hybrid workflow design



Practical implementation

- Coding for heterogeneous HPC clusters
- Optimize hardware and scheduling
- Algorithmic intuition, QPU co-processing

Move beyond Jupyter notebooks to software engineering

Scaling the Quantum Workforce

DigiQ model

Master's level education

DigiQ
2022-2027

- **Curriculum development:** modules development and integration
- **Student mobility:** events and internships with European universities, RTOs, and quantum startups
- **Student networks**



European Quantum Academy

Education, training, and ecosystem

EQA
2026-2030

- Master's & Bachelors curricula
- PhD and experimental lab
- Industry training, micro-credentials
- High school & Outreach
- Regional Quantum Academies: ecosystem development



26 institutions, 20+ collaborating entities

72 institutions → 100+ collaborating entities

EQA: Ecosystem Platform

Gap identification: mapping academic coverage and industry needs

Pan-European platform

- Connecting academic master's programs, education providers with regional ecosystems
- Surveying enterprise and SME skill requirements
- Targeted curriculum development

Educational lead time: 3-5 years

- a. Meeting current demands
- b. Anticipating future needs: beyond NISQ

EQA + EuroHPC

- Mapping and gap analysis
- Content development, dissemination
- Co-design curricula
- User needs and expectations



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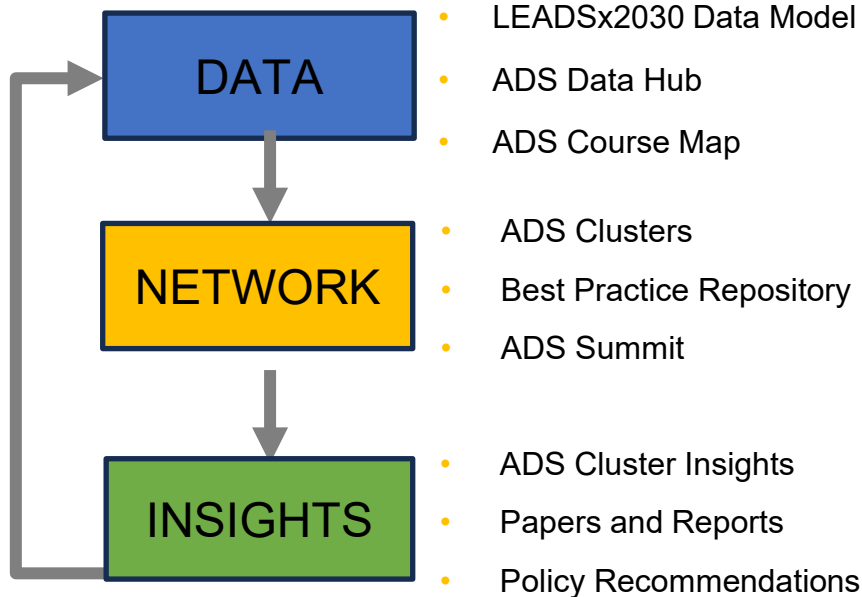


EuroHPC
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Building Talent Pipelines in Advanced Digital Skills

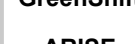
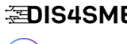
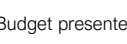
Dr Julie Byrne, Trinity College Dublin, Ireland
LEADSx2030



Join us in Dublin October 15-16

<https://digitaltalentdays.eu/>

About LEADSx2030

SPECIALISED EDUCATION PROGRAMMES 2021	SPECIALISED EDUCATION PROGRAMMES 2022	SPECIALISED EDUCATION PROGRAMMES 2023	SPECIALISED EDUCATION PROGRAMMES 2025	SHORT-TERM TRAINING COURSES	CYBERSECURITY SKILLS ACADEMY	REINFORCING SKILLS IN SEMICONDUCTORS	OTHERS
TOTAL BUDGET* €400M	TOTAL BUDGET* €400M	TOTAL BUDGET* €35M	TOTAL BUDGET* €400M	TOTAL BUDGET* €400M	TOTAL BUDGET* €400M	TOTAL BUDGET* €400M	TOTAL BUDGET* €400M
8 PROJECTS	12 PROJECTS	5 PROJECTS	9 PROJECTS	12 PROJECTS	5 PROJECTS	2 PROJECTS	1 PROJECT
      	       	 	       	         	    	      	

*The featured projects have different funding rates ranging from 50 to 100%. The Total Budget presented hereafter accounts for the project budget plus EU contributions.

Advanced Digital Skills SO4 Cluster

Cluster insights

Building
the
pipeline



Recommendations

Support

Scaling

Sustainability