Europe's HPC Talent Challenge:

Key Insights from the EuroHPC Summit 2025 Panel

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Half a year after the EuroHPC Summit 2025 in Krakow, it's worth looking back at one of the most engaging sessions held in Krakow (at least for me and for the ACHIEVE project). Moderated by Linda Gesenhues (Programme Manager at EuroHPC-JU), a panel tackled a central question for Europe's digital future: how to attract and retain top HPC talent. This document provides a short summary of the discussion for those who could not attend the event, as well as for students and professionals interested in gaining a clearer understanding of the current landscape. The full video is available on the EuroHPC JU YouTube channel: https://youtu.be/bT-5HsAo1SM?si=mE-cc6tmEQR3l16z

Overview

High-Performance Computing (HPC) is increasingly seen as a strategic asset for Europe's competitiveness in innovation, research, and industry. This discussion took place against a backdrop of global competition (notably from China, Japan, and the United States) and a recognized skill shortage that threatens Europe's ability to capitalize on HPC-driven advances in AI, data analytics, quantum computing, and more.

Recent statistics show that four out of five SMEs in Europe face difficulties in finding qualified HPC professionals. Demand for HPC skills continues to grow faster than universities and training programs can supply new graduates. Meanwhile, Europe generates

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a considerable pool of HPC-capable talents, especially through specialized master's and doctoral programs, but struggles to retain them in the region. During the panel discussion, it was underlined that while attracting HPC talent is essential, ensuring its retention is equally important.

EU Initiatives

Within Europe, several initiatives are ongoing to foster the development of a new workforce in HPC and to support reskilling, with the aim of attracting and retaining talent in this strategic field. Examples are the following:

- **Union of Skills.** The European Commission has launched the "Union of Skills" to address skill gaps across the continent. This initiative supports upskilling and reskilling and aims to standardize recognition of qualifications across EU borders.
- **National Competence Centers.** National Competence Centers were highlighted as a powerful way to support SMEs in applying HPC and to address the need for practical, industry-driven skill development.
- **The "EuroHPC Academies".** This initiative can be divided into three sub-actions, all linked to the EuroHPC project. These sub-actions target both in-person activities and self-paced learning opportunities.
    - *HPC SPECTRA*, which aims at improving the EuroHPC JU's training strategy by developing an innovative EuroHPC Training Platform (an intuitive gateway to a comprehensive database of European HPC training activities) and co-organising the HPC Summer School (IHPCSS). https://www.eurohpc-ju.europa.eu/research-innovation/our-projects/hpc-spectra_en
    - The *EuroHPC Virtual Training Academy (EVITA)* which aims to develop a standardised European training framework in HPC. EVITA aspires to create an interconnected community of learners, educators, and industry professionals who are empowered with cutting-edge HPC knowledge and skills. https://www.eurohpc-ju.europa.eu/research-innovation/our-projects/evita_en
    - *EUMaster4HPC* **-** a collaboration among a large number of universities, supercomputing centers, and companies to develop a specialized curriculum that better aligns with industry needs and ensures graduates are "job-ready" specifically for the HPC fields. https://www.eurohpc-ju.europa.eu/research-innovation/our-projects/eumaster4hpc_en

Despite not being explicitly mentioned during the panel, because still not fully active, among the European initiatives, we cannot forget also the ACHIEVE project (Advanced Cloud & High-performance computing Education for a Valiant Europe, https://www.eitdigital.eu/eu-collaborations/achieve/) and its related Master Program in Cloud Computing and High-Performance Computing (HPC), with a strong focus on innovation and entrepreneurship. The program falls under the EIT Digital Master School and is designed to improve the quality of EU higher education in the domain of IT infrastructures.

Panelist Insights

In addition to outlining the European initiatives, within this document we want also to share selected perspectives from the panelists covering SMEs, large enterprises, and the student community. The following points summarize the main highlights of their remarks, without fully reproducing their interventions.

- **Jan-Mark Denies (Viridien)** pointed out that a decade or so ago, the HPC talent shortage was barely on the radar. Today, it has become evident that HPC professionals are essential for Europe's technological and economic sustainability, and this shift in awareness needs to be accelerated.
- **Valentin Plugaru (LUXProvide)** shared his experience explaining that around 5–10 years ago they launched a brand-new HPC facility. While setting up the infrastructure was a significant endeavor, the greatest challenge proved to be hiring and retaining the specialized team needed to run it effectively. This underscores the broader issues faced across Europe in recruiting skilled HPC professionals in a competitive, rapidly evolving market.
- **Fabrizio Magugliani (E4)** emphasized that HPC is not solely about massive supercomputers tackling grand challenges. Even a small bug in firmware or a BIOS line of code can make an entire system unbootable, illustrating the breadth of expertise required, from low-level hardware to complex software.
- **Perspectives from Students (Patrik Rác, PhD, and Majesa Trimmel, MSc).** The students noted that one retention challenge is the breadth of knowledge HPC demands (hardware, software, domain science, etc.). Many talented individuals leave when confronted by the enormous scope of skills required. Another point highlighted was about salary levels (especially compared to AI and mainstream data

science roles) and the difficulty in finding concrete information about actual HPC job opportunities.

Key Challenges & Proposed Solutions

Thanks to the support of some live polls, the panelists reflected on the key challenges that still need to be addressed in the field. For each of these challenges, panelists and experts have put forward possible solutions, which are summarized in the following points.

- **Salary Competitiveness.** A recurring theme was that Europe's HPC salaries often fall behind AI and data science roles, making HPC less attractive financially. Companies and policy makers must explore alternative incentives—such as faster career growth, exciting projects, and research–industry collaborations.
- **Visibility and Promotion of Opportunities.** Lack of awareness about the variety of HPC opportunities, especially for students, means many do not even consider HPC careers. A central European HPC job platform could help showcase available roles, projects, and career paths.
- **Bridging Academia and Industry.** Panelists noted that master's programs often do not fully match industry's needs. Closer ties between universities, research centers, and corporations can ensure the curriculum remains relevant and that students receive practical, up-to-date training.
- **Avoiding Overspecialization.** Some voiced concern that if companies dominate curriculum design, training may become too narrow. A balance is needed to produce graduates who can think creatively and approach HPC challenges from multiple angles, since "*10% incremental improvements are no longer enough; we need innovative leaps*."
- **Micro-Credentials.** The concept of micro-credentials was introduced as a way to attract individuals who may not have a traditional HPC background. Short, specialized courses could help them "try out" HPC, build initial expertise, and potentially transition into the field more smoothly.

Conclusions from the panel

The “Attracting HPC Talent in Europe” panel underscored that HPC skills are crucial for Europe’s competitiveness in emerging technology fields. While salary competitiveness remains a challenge, the panelists and audience also highlighted the importance of:

- *Comprehensive Career Pathways* and growth opportunities within HPC roles;
- *Strong Academic–Industrial* Partnerships to ensure relevant, practical training;
- *Visibility of HPC Opportunities*, including a centralized job platform;
- *Flexible, Modular Education* (e.g., micro-credentials) to attract new talent;
- *Well-structured EU-wide initiatives*, such as the EuroHPC Virtual Academy and EUMaster4HPC, to standardize and promote HPC skill recognition.

By collaborating across academia, industry, and European institutions, there is the hope to narrow the skills gap, inspire the next generation of HPC professionals, and ensure that Europe remains at the forefront of HPC innovation.

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