



PRESS RELEASE

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EUROPE-JAPAN COLLABORATION IN HIGH-PERFORMANCE COMPUTING HIGHLIGHTED AT HIGH-LEVEL SYMPOSIUM

From January 13 to 15, 2025, Barcelona hosted the High-Level Symposium (HLS) on "EU-Japan Collaboration in High-Performance Computing (HPC)", a landmark event for strengthening research and technological ties between Europe and Japan in the fast advancing field of supercomputing.

Porto, January 23, 2025

Organised by the HANAMI project and hosted by the Barcelona Supercomputing Center (BSC) in Castelldefels, the symposium brought together leading researchers, policymakers, and stakeholders from both regions to discuss the future of HPC and the role of international collaboration in addressing global challenges, like climate change, next-generation materials and biomedical advancements.

Over the course of three days, the event featured more than 50 talks with over 80 participants from both regions, underscoring the importance of cross-continental collaboration to accelerate innovation in HPC.

Accelerating innovation through EU-Japan collaboration

The symposium provided a unique platform for European and Japanese researchers to exchange ideas, share expertise, and discuss joint innovations.

Kosuke Nakano from the National Institute for Materials Science (NIMS) in Japan highlighted the event value: "This conference was exceptional because it brought together Japanese and European researchers who had previously collaborated individually; now we are discussing future projects collectively."

Nakano also emphasised the HANAMI project role in fostering collaboration: "With HANAMI, we can exchange common knowledge to accelerate collaboration between Europe and Japan. Doing so through our research activities, which is quite nice, is a very good opportunity to exchange our knowledge."

The cooperation can have a major role in "advancing knowledge in critical fields such as climate, biomedicine and materials science, areas of the utmost importance for the prosperity of both societies", added Andreia Passos, Manager of the International Relations Service of INESC TEC.

Erik Lindahl, a Professor of Biophysics at KTH in Stockholm, echoed this sentiment, mentioning the unique advantages of working with Japan: "The HANAMI project gives a chance to work with some of the most skilled professionals in the world in this field, who happen to be in Japan - an area that is historically overlooked. There are so many collaborations with the US, but the teams tend to forget that there's an equal amount of proficiency in Japan".

Lindahl further elaborated on the complementary strengths of both regions: "Japan has always defined the country's own paths and science development. Their computer architectures are completely different from the rest of the world. They have far better scaling tools. On the other hand, I think that we have been more proficient when it comes to porting things or accelerators, for instance, thus creating a very beneficial and neutral exchange of ideas".

Key opportunities and challenges across scientific domains

The symposium featured specialised sessions in climate modelling, biomedical applications and materials science, showcasing the areas where EU-Japan collaboration can make the greatest impact.

Lindahl praised Japan's multidisciplinary expertise in biomedical sciences: "Both Japan and Europe are exceptionally skilled in life sciences; we developed some of the leading tools in the world. Concerning Japan, what amazed me the most during this conference was the vast competence of their professionals, not just in understanding molecules, but also other biological aspects, like understanding and predicting diseases, as well as the development of cells. Also important was to witness how much concrete work is already taking place between Europe and Japan".

Alfonso Valencia, from the Barcelona Supercomputing Center, highlighted his team's longstanding collaboration with Japanese researchers in genomic projects, including cancer research under the International Cancer Genome Consortium: "This collaboration allows us to combine genomics with advanced simulation and machine learning methods, unlocking new insights into the origins of cancer and potential treatments".

Concerning the climate area, Samuel Hatfield, from the European Centre for Medium-Range Weather Forecasts (ECMWF), discussed the technical challenges and opportunities in optimising performance across European and Japanese supercomputers: "When I seek to benefit from computer hours on a Japanese supercomputer, I must learn a slightly different set of procedures from the European equivalents. They [the Japanese] also tend to procure slightly different hardware from the European machines. So, even if I develop a code that runs very well on a European supercomputer, it will not automatically run very fast on a Japanese supercomputer.

Ensuring a proper performance portability across both requires strong collaboration with folks on the Japan side”.

Addressing global competitiveness in HPC

The symposium also addressed the growing competitiveness of HPC in Europe, Japan, and the United States. Rio Yokota, from the Institute of Science Tokyo and an expert in HPC and Artificial Intelligence (AI), highlighted the importance of collaboration to counterbalance the dominance of American tech giants: “Europe and Japan have very large supercomputers; but with the current state of AI, the US - especially the big tech companies - are the leaders when it comes to the most powerful machines. In fact, their machines are much powerful than our supercomputers. It's very important to us, especially in Japan, to collaborate with your European countries and share our resources to compete with these dominant AI companies”.

A unified vision for the future

The symposium concluded with a strong call for sustained and expanded cooperation between Europe and Japan for the future of HPC.

Regarding the biomedical sciences field, Europe and Japan are collaborating and exchanging codes both ways. “One of the best examples is that, historically, we've been happy with scaling our codes, but that is breaking down. Now, with the algorithms that we had before, it would have been virtually impossible to scale up to a million cores. In this sense, the Japanese professionals have developed some tools that will enable that, and they are now porting these tools into our European code in GROMACS - which would never have happened without HANAMI. It is an incredible example of the opportunity that HANAMI provides to the future of HPC”, said Lindahl.

Fabrizio Gagliardi, Head of International partnership at BSC, expressed his satisfaction with the event outcomes: “I'm very pleased because, from my perspective, we had a lot of discussion and interaction within the work packages, but also with the wider audience, reviewing collaboration and exploring opportunities with the Japanese institutions that participated in the event”.

Gagliardi also highlighted the improved collaboration, especially in the life science area as a key achievement, particularly through bilateral activities, despite the unbalanced funding resources in Japan.

This event featured two co-located events: the CEA-RIKEN School: Kokkos Training, focused on Kokkos' programming capabilities, with lectures and hands-on training from top-level Kokkos experts to the several students from Japan and Europe, who participated in the event. In addition, the HANAMI Sustainability Workshop on "Europe-Japan Strategic Dialogue on High-Performance Computing Collaboration" brought together national policymakers, funders, and key stakeholders to explore the pivotal role of Europe-Japan collaboration in advancing HPC international collaboration. This hybrid event was attended by over 60 participants from different institutions and authorities, such as the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan, the French embassy to Japan and contributions from European EuroHPC centers, like GENCI.

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