SPACE CoE NEWSLETTER

Dear readers,
The SPACE Centre of Excellence partners have been very active over the past months, and we are pleased to bring you this year's second newsletter, highlighting the most important news from our community. We are focused on astrophysical and cosmological applications, and our main objective is to enable the most widely used European HPC codes in astronomy and cosmology to efficiently and effectively exploit the pre-exascale systems provided by EuroHPC JU, and to prepare them for the transition to exascale and beyond. We invite you to explore our latest activities, publications, and upcoming events in our newsletter and on our website.

Your SPACE CoE

Latest events

SPACE Project General Assembly, Heraklion (Greece), 27–28 May 2026

In the last week of May, the SPACE CoE consortium met in Heraklion for its General Assembly, hosted by the Foundation for Research and Technology – Hellas. The meeting provided a valuable opportunity to discuss the project's progress and align on next steps toward advancing innovation and excellence in astrophysics and cosmology at the exascale. The assembly offered all partners a valuable opportunity to engage in inspiring discussions and productive exchanges, further strengthening collaboration across the consortium.

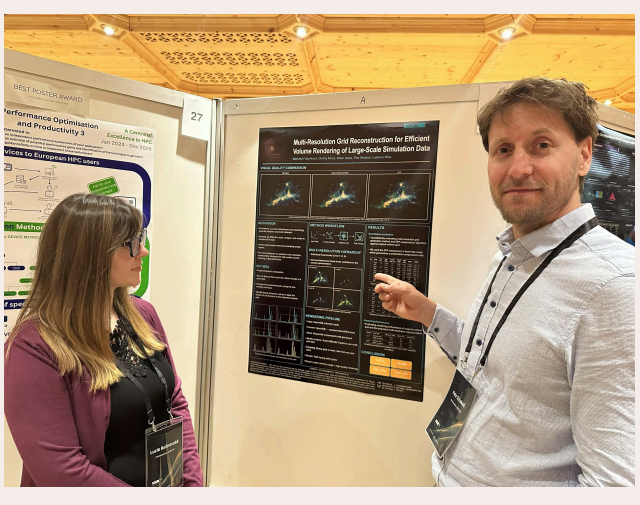
Find out more about the SPACE CoE

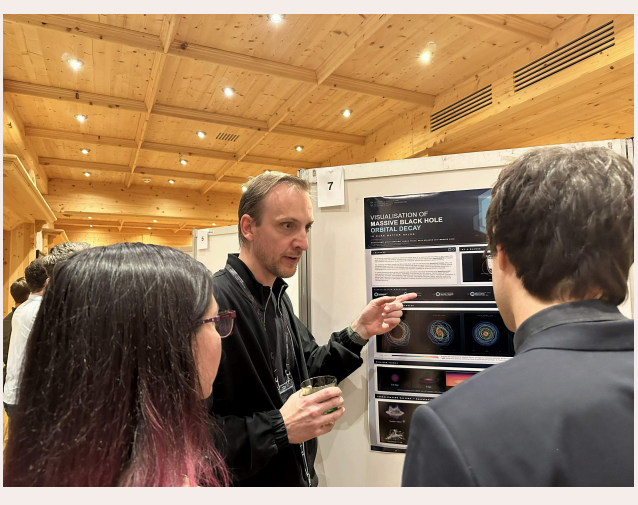
CF'26 Catania (Italy), 19–21 May 2026

The 23rd ACM International Conference on Computing Frontiers (CF'26) took place in Catania, bringing together researchers exploring emerging computing technologies and scientific breakthroughs for society. This year, CINECA hosted the first edition of the SP4Sci workshop, organised by Nitin Shukla in collaboration with colleagues from the University of Salerno, Politecnico di Milano, and E4 Computer Engineering. The workshop was aligned with several European initiatives, including SPACE CoE. A highlight of the conference was the presentation by Alessandro Romeo, titled "On the Limits of Performance Portability in Directive-Based GPU Programming".

More about CF'26

HPCSE 2026, Beskydy mountains (Czech Republic), 18–21 May 2026





IT4Innovations National Supercomputing Center organised the High Performance Computing in Science and Engineering 2026 conference, welcoming 84 attendees in the Beskydy Mountains in the Czech Republic. Petr Strakoš from IT4Innovations attended the conference and presented the poster "Multi-Resolution Grid Reconstruction for Efficient Volume Rendering of Large-Scale Simulation Data", promoting the SPACE Centre of Excellence. His colleague Milan Jaroš also presented a poster related to the SPACE project, titled "Visualisation of massive black hole orbital decay in dark matter halos".

More about HPCSE 2026

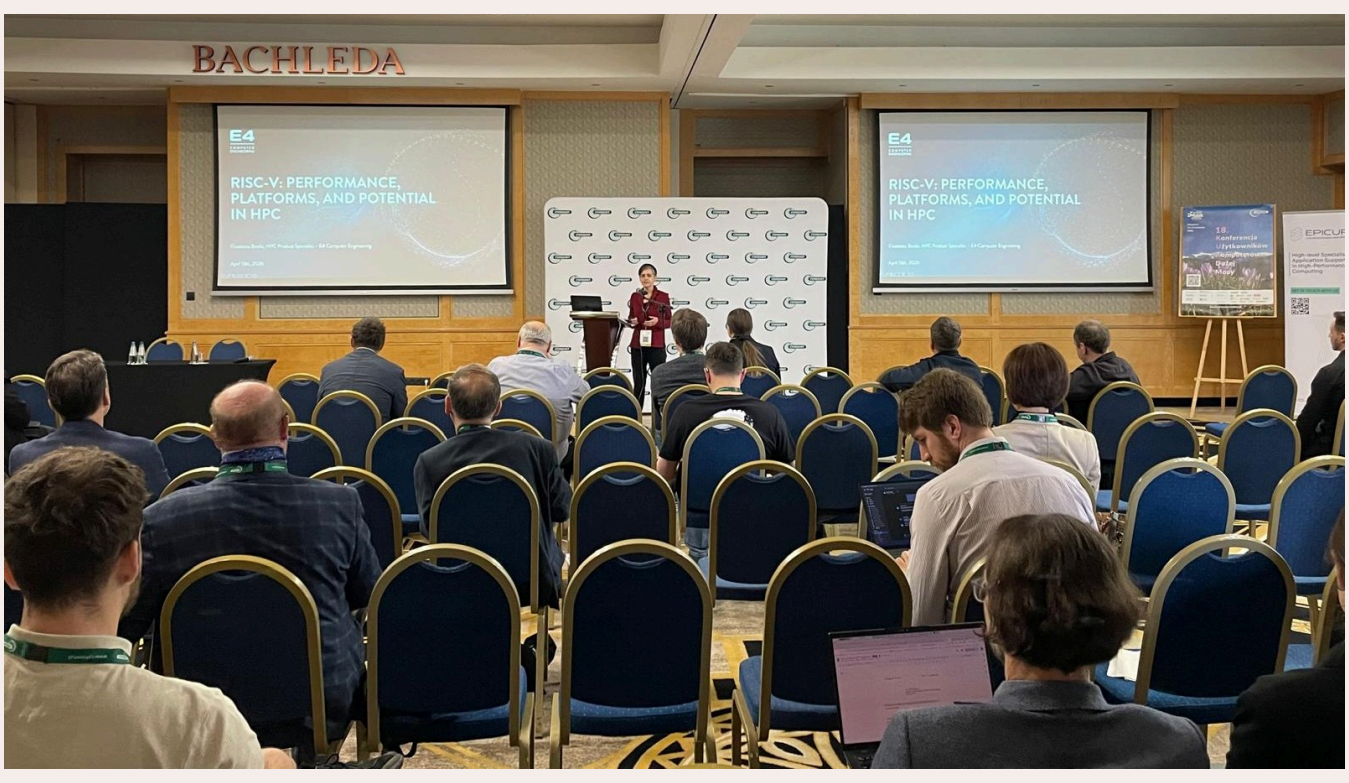
Introduction to HPC and ML/DL for Astrophysics, Bologna (Italy), 29 September – 1 October 2025 and 11–14 May 2026

CINECA organised two editions of the course "Introduction to HPC and ML/DL for Astrophysics", dedicated to PhD astrophysics students in Bologna. The courses took place in autumn 2025 and spring this year. As part of the programme, SPACE CoE was presented through dedicated sessions on HPC applications for astrophysics, including introductions and tutorials on the gPLUTO and OpenGadget codes. The first edition welcomed 13 students, while the second edition was attended by 19 students.

Course 1

Course 2

KUKDM 2026, Zakopane (Poland), 13–15 April 2026



The HPC Users' Conference (KUKDM) took place in mid-April and focused on large-scale computing and simulations, novel algorithms in computer science, tools and techniques for high-performance computing, artificial intelligence methods, and the analysis of large data sets. The programme featured plenary and poster sessions, panel discussions, and opportunities to meet suppliers of computing hardware and software. A highlight of the conference was the series of

presentations delivered by invited speakers and sponsors, including Elisabetta Boella from E4 Computer Engineering, who presented the activities of the SPACE CoE in her talk, “RISC-V: Performance, Platforms, and Potential in HPC.”

KUKDM 2026

HPCMS at PDP 2026, Cluj-Napoca (Romania), 25–27 March 2026

We are pleased to inform you that the paper “Accelerating the Particle-In-Cell code ECsim with OpenACC” received the Best Paper Award in the High Performance Computing in Modelling and Simulation session at the PDP 2026 conference on parallel, distributed, and network-based processing. The paper, authored by Elisabetta Boella, Nitin Shukla, Filippo Spiga, Mozhgan Kabiri Chimeh, Matt Bettencourt, and Maria Elena Innocenti, brings together expertise from academia and industry to push the boundaries of high-performance computing.

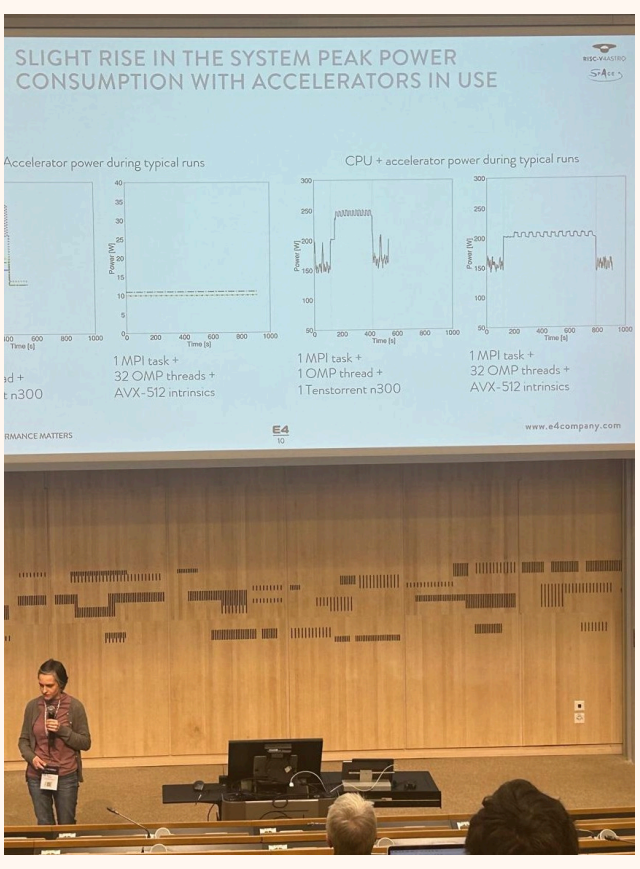
PDP 2026

USC-C General Assembly, Trieste (Italy), 9–13 March 2026

The SPACE Centre of Excellence was featured at the INAF Computing General Assembly in Trieste, where two presentations highlighted key tools and developments supporting astrophysical research and high-performance computing. Luca Tornatore presented OpenGadget3, a cosmological simulation code used to model the formation and evolution of cosmic structures. The talk showcased ongoing developments aimed at improving its performance and scalability on exascale systems. Nicola Tuccari introduced VisIVO, a powerful visualisation and data analysis environment designed to handle the increasingly large and complex datasets produced by modern astrophysical simulations.

USC-C General Assembly

2026 CERN openlab Technical Workshop, Geneva (Switzerland), 4–5 March 2026



The 2026 CERN openLab Technical Workshop took place at CERN in early March. It provided a perfect opportunity for the industrial partners to meet with the students and fellows working on various projects. The event featured technical talks, networking sessions, and a technology track dedicated to industrial partners. Elisabetta Boella from E4 Computer Engineering presented the results of the SPACE CoE in her presentation “Porting and Performance Assessment of a Gravitational N-body code on the RISC-V-Based Tenstorrent Wormhole accelerator".

2026 CERN openlab Technical Workshop

Astroinformatics 2026, Cologne (Germany), 23–27 February 2026

The Astroinformatics 2026 conference was hosted by the University of Cologne during the last week of February. Focused on the Dynamics of the Universe and DYNAVERSE, the event was dedicated to the latest advances in computational methods for processing and analysing astronomical data. Partners from the Heidelberg Institute for Theoretical Studies contributed to the conference programme. Romain Chazotte took part in the “Confronting Models with Data” session, where he presented a talk titled “Improved O(2) Equivariance via Embedding in Zernike Polynomial Space”. His colleague Bernd Doser introduced a SPACE CoE poster focused on representation learning for Gaia XP DR3.

Astroinformatics 2026

World RISC-V Days, Turin (Italy) and worldwide, 23–27 February 2026

Elisabetta Boella took the stage at World RISC-V Days, held at Politecnico di Torino at the end of February. Speaking to an enthusiastic audience of students, educators, developers, and industry leaders, she showcased the latest work on RISC-V-based CPUs and accelerators developed within the framework of the RISCV4ASTRO, MaX, and SPACE projects. As a proud partner of RISC-V International, E4 Computer Engineering believes in the strategic value of RISC-V, not only as a driver of innovation in high-performance computing but also as a key enabler of European technological sovereignty.

World RISC-V Days

iPIC3D, Leuven (Belgium), 4–6 February 2026

The conference on Modelling Astrophysical Plasmas with iPIC3D: First Conference on Implicit PIC Simulations and Beyond took place at KU Leuven at the beginning of February. SPACE CoE partners Pranab Deka, Fabio Bacchini, Rostislav-Paul Wilhelm, and Nicolas Moens from KU Leuven prepared a hands-on training session introducing participants to the latest version of iPIC3D for CPUs and GPUs. The session guided attendees through installing and running the code, creating their own input parameters, and visualising simulation data.

iPIC3D

Upcoming events

18th International Workshop on Science Gateways

IWSG 2026

16–19 June 2026 | Catania (Italy)

The IWSG 2026 will focus on science gateways as user-friendly platforms that make large-scale computing, data, and advanced digital infrastructures more accessible to research communities. With science gateways increasingly integrating technologies such as cloud, edge computing, IoT, AI, and blockchain, IWSG 2026 will provide a space to discuss current challenges, share innovative solutions, and explore future directions for wider adoption across diverse scientific domains.

Find out more

ISC High Performance

ISC High Performance 2026

22–26 June 2026 | Hamburg (Germany)

ISC 2026 will bring together the global communities of high-performance computing, artificial intelligence, and quantum technologies. Under the theme “Connecting the Dots”, the event will offer five days of tutorials, conference sessions, workshops, networking opportunities, and Europe’s largest HPC exhibition. The activities of the SPACE CoE will be presented by Daniele Gregori from E4 Computer Engineering and Erwan Raffin from BULL at the EuroHPC JU booth (J30) on 25 June at 2 PM. Come by and find out more about the SPACE CoE!

Stay tuned

MACHINE LEARNING FOR ASTROPHYSICS
3RD EDITION VALLETTA, 31 AUG - 4 SEP, 2026

ML4ASTRO3

31 August – 4 September 2026 | Valletta (Malta)

The 3rd International Conference on Machine Learning for Astrophysics will explore the growing role of machine learning and artificial intelligence in addressing key challenges in astrophysical research. The event will focus on advanced machine learning and deep learning methods for analysing both observational and simulation data in the big data era. Through oral presentations and poster flash talks, ML4ASTRO3 will showcase recent developments, new approaches, and innovative applications at the intersection of AI and astrophysics.

Register

Training opportunities

PLUTO/OpenGadget3 Symposium 2026

PLUTO/OpenGadget3 Symposium

15–18 June 2026 | Heidelberg (Germany)

The HPC Summer School will be held as part of the first joint PLUTO/OpenGadget3 Symposium at the House of Astronomy in Heidelberg. The Symposium will offer a space for experienced users to present the capabilities of both codes to the wider community, while also supporting new users interested in learning how to use them efficiently and make the most of their performance.

Find out more

Have you missed any previous training? Do not worry! The majority of our training events can be found on the SPACE CoE YouTube channel.

Latest publications

SPACE-Timers – A stack-based hierarchical timing system for C++

Accelerating the Particle-In-Cell code ECsim with OpenACC

Out-of-core aware multi-GPU rendering for large-scale scene visualization

Exascale computing to accelerate discoveries in astrophysics and space plasma physics

Hybrid Streaming Workflows for Scalable Visualization in Astronomy and Cosmology

Simulating the Invisible: How Supercomputing Advances Black Hole Research

If you want to contact us, please write to info@space-coe.eu.

Follow us

LinkedIn Youtube

Acknowledgement

Centres of Excellence for HPC Applications – Horizon-EuroHPC-JU-2021-COE-01

Funded by the European Union. This work has received funding from the European High Performance Computing Joint Undertaking (JU) and Belgium, the Czech Republic, France, Germany, Greece, Italy, Norway, and Spain under grant agreement No. 101093441.

Co-funded by
the European Union