EURO-LABS Newsletter

ISSUE No.4 | JUNE 2025

Group photograp at the 2024 Hands-on training school on operation, test and repair of HPGe detectors

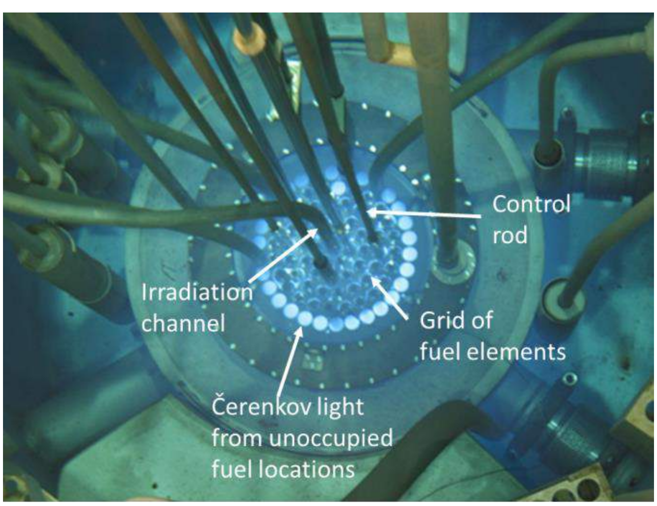

Photo of the TRIGA reactor core at full power

EDITORIAL

M. COLONNA, INFN

CONTENT

Visit our website: https://web.infn.it/EURO-LABS/

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

EDITORIAL

Maria Colonna
For the EURO-LABS Team

Dear Readers,
We are pleased to present the fourth edition of the EURO-LABS Newsletter, which comes at a significant moment for our project. This issue follows the completion of our second periodic report — an important milestone that offered a valuable opportunity to reflect on the progress made so far.
The preparation of the report allowed us to assess the tangible results achieved across the EURO-LABS program and to evaluate the growing synergy and collaboration among the three core communities involved: Nuclear Physics, High-Energy Accelerators, and High-Energy Detector R&D. Enhancing the level of integration between these communities has been one of the defining successes of the project, fostering interdisciplinary cooperation and driving innovation across the board.
This edition of the newsletter features several of the relevant accomplishments and developments that emerged during this period. While it is difficult to capture the full breadth of the project's achievements in a single issue, we present a few to illustrate the impact and potential of EURO-LABS.
The selected topics cover a range of developments, from new advancements in communication tools to initiatives aimed at enhancing the coordinated use of beam time and key instrumentation across Europe.
These also highlight recent progress in addressing critical challenges—such as radiation damage-in High-Energy Accelerator and Detector R&D. Finally, this edition concludes with an article describing the advanced training school on accelerators recently held at CERN. A brief summary is provided below.
The project has recently improved its presence on the social media platforms LinkedIn and Instagram. For collaborative and innovation-driven initiatives like EURO-LABS, social media is an essential tool for bringing to a wider audience the goals and showcasing our achievements. Regularly sharing content on social platforms not only keeps our community informed but also promotes transparency, enhances integration and encourages wider public engagement and participation.
Within the Work Package 2 (WP2) of EURO-LABS, the CLEAR distributed facility is a significant step toward the goal of fostering closer collaboration and integration of pan-European accelerator facilities. It is a consortium of three installations: ATOMKI in Debrecen, CNA in Seville, and IST in Lisbon. Through the EURO-LABS framework, CLEAR provides access to stable-ion and neutron beams, enhancing transnational collaboration and scientific research. The article in this issue describes representative examples of key instrumentation and highlights important scientific outputs of the Transnational Access (TA) provided at CLEAR.
Service improvement is an integral part of EURO-LABS, to improve the opportunities at the participating facilities. Among them, the INTRANS task focuses on optimizing the use of experimental setups for nuclear spectroscopy within EURO-LABS research

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

EDITORIAL

infrastructures. By offering training and facilitating knowledge exchange in spectroscopic methods and instrumentation, INTRANS aims to raise the quality of scientific output. Particular attention is paid to Germanium detectors, a cornerstone of nuclear spectroscopy, both in fundamental nuclear physics and nuclear astrophysics.

As next-generation accelerator target facilities become more powerful and intense—such as those used in High Energy Physics—they face major technical challenges, particularly related to radiation damage and thermal shock. These issues comprise on performance and reduce the lifespan of target systems. To face these cross-cutting challenges, the RaDIATE Collaboration (Radiation Damage In Accelerator Target Environment) unites expertise from over 20 international institutions, including CERN. Within the framework of EURO-LABS Work Package 3 (WP3), several thermal shock studies have been conducted at CERN's HiRadMat (High-Radiation to Materials) facility, advancing our understanding of material tolerance and contributing to the development of more resilient high-power target systems.

In high-energy physics experiments, radiation damage is a critical issue also for silicon detectors used in charged particle tracking.

Displacement of silicon atoms by neutrons, protons, or other high-energy particles significantly degrades detector performance, with neutrons playing a particularly dominant role. The Ljubljana reactor is a key facility for studying radiation effects on particle detectors. Through Work Package 4 (WP4) of EURO-LABS, researchers benefit from TA for conducting irradiation experiments essential for advancing detector technology.

Finally, training the next generation of scientists is one of the core missions of EURO-LABS. The second edition of CERN's Advanced Training School on Accelerators (ATSOA) took place in spring 2025, bringing together nineteen early-career scientists and engineers from ten countries for an intensive week of hands-on learning in accelerator science. Hosted at CERN, ATSOA offered a unique educational experience that blended foundational academic lectures with practical training and direct exposure to real-time beam operations across four of CERN accelerator facilities. The school received very positive feedback. Trainees emphasized the benefits of integrating theoretical lectures with practical, hands-on sessions, and appreciated the unique opportunity to engage directly with operating accelerators. Many expressed a strong interest in returning to CERN for additional training or future collaboration.

We hope you enjoy reading about these activities and continue to follow the progress of EURO-LABS as we move forward.

Contact information
Maria Colonna, INFN-LNS, Catania (Italy)
colonna@lns.infn.it

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

Amplifying impact: sharing EURO-LABS updates on Social Media

Stefania Melandri, Barbara Pezzotta

In today's interconnected digital landscape, visibility is not just a benefit—it's a necessity. For initiatives like EURO-LABS, which thrive on collaboration, innovation, and public engagement, social media is a vital tool for amplifying our mission and achievements. Sharing content regularly across platforms such as LinkedIn and Instagram not only keeps our community informed but also fosters transparency and broader participation.

Social media serves as a dynamic bridge between the scientific community and the general public. By posting timely updates, project milestones, and behind-the-scenes insights, EURO-LABS makes complex research accessible to a wider audience. This is especially crucial for European-funded projects, where dissemination is very important.

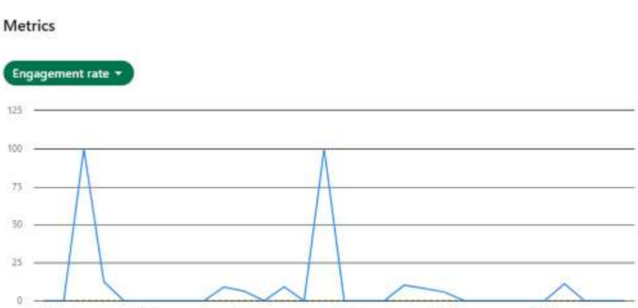

Figure 1: Engagement rate on LinkedIn

Moreover, consistent social media activity enhances the visibility of EURO-LABS. Tagging institutions, acknowledging contributors, and sharing multimedia content—such as infographics, short videos, and testimonials—can significantly boost engagement. It also opens doors for new partnerships, funding opportunities, and invitations to participate in high-level discussions and events. To support this effort, the EURO-LABS communication team has been developing a content calendar to ensure coherence and updates across all posts. Contributors are fundamental to submit updates, photos, and event highlights to be featured on our official channels. Whether it's a breakthrough in a point-of-care technology, a successful meeting, or a new dissemination plan, every story adds value to our collective narrative.

Let's harness the power of social media to showcase the impact of EURO-LABS. Every post is a chance to inspire and inform. We look forward to more of you joining this endeavor.

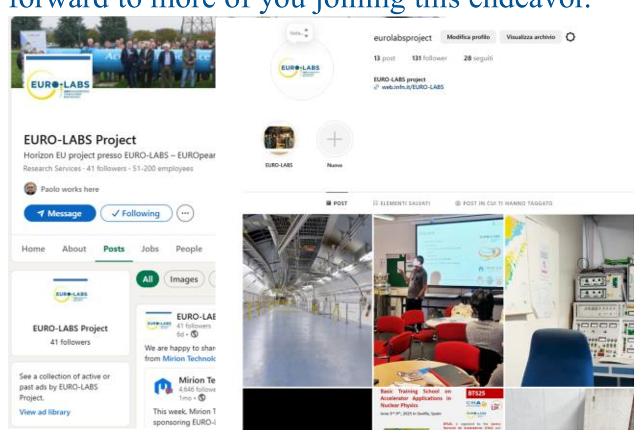

Figure 2: Social media platforms

Contact information

Barbara Pezzotta, INFN
barbara.pezzotta@bo.infn.it
Stefania Melandri, Tinexta Innovation Hub
Stefania.melandri@tinextainnovationhub.com

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

CLEAR: CLUSTER of LOW ENERGY ACCELERATORS for RESEARCH

Joaquín Gómez-Camacho, Sandor Biri, Victoria Corregidor

One of the overall objectives of EURO-LABS, as well as the preceding European projects ENSAR2 and ENSAR, is to achieve a closer collaboration and integration of the European nuclear physics facilities. The distributed facility CLEAR represents an important step in that direction. CLEAR is a consortium of three installations: ATOMKI in Debrecen, CNA in Seville and IST in Lisbon, offering access to stable-ion and neutron beams, in the framework of the EURO-LABS project.

CLEAR offers the research community a variety of accelerators. ATOMKI provides a 2 MV Tandem, 18 MeV Cyclotron, and an ECR ion source. CNA provides a 3 MV Tandem, a 18 MeV Cyclotron, and a 1 MV Tandetron for Accelerator Mass Spectrometry (AMS). IST provides a 2.5 MV Van de Graaff. These accelerators provide multiple ion beams: protons from 0.5 keV to 20 MeV, deuterons up to 9 MeV, alphas up to 20 MeV, low energy heavy ions, neutrons up to 10 MeV, electrons of 8-12 MeV and photons of 4-10 MeV. CLEAR offers its users a variety of equipment, including a variety of detectors and the associated electronics and data acquisition.

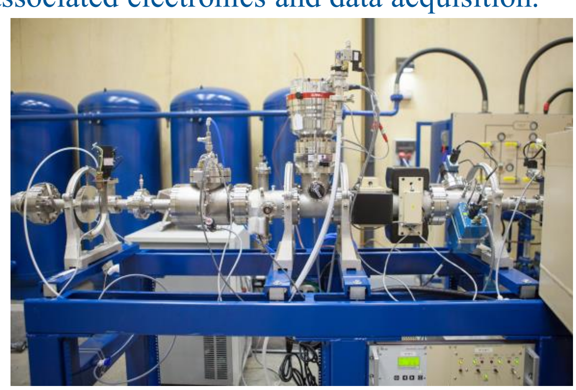

Figure 3: Neutron beam line at the TANDEM accelerator at CNA

Details can be seen in the CLEAR web page. We outline here examples of some unique equipment provided.

CNA provides a neutron beam line, depicted in Figure 3. It generates neutrons through specific (p,n), (d,n), (alpha, n) reactions. The beam line has systems for chopping and bunching the beam. This allows to obtain the energies of the outgoing neutrons through time of flight measurements.

ATOMKI provides an ECR ion source, shown in Figure 4. This infrastructure enables fundamental and applied plasma physics studies through non-invasive multi-diagnostics systems, with implications for ion source R&D. X-ray diagnostics emerge as a very powerful tool for monitoring plasma parameters, and confinement dynamics. IST provides a nuclear microprobe, shown in Figure 5. This allows to focus the charged particle beam up to micrometer dimensions and raster the surface of the sample to be analysed. Several ion beam analytical techniques are simultaneously done providing thus elemental compositional maps and depth information.

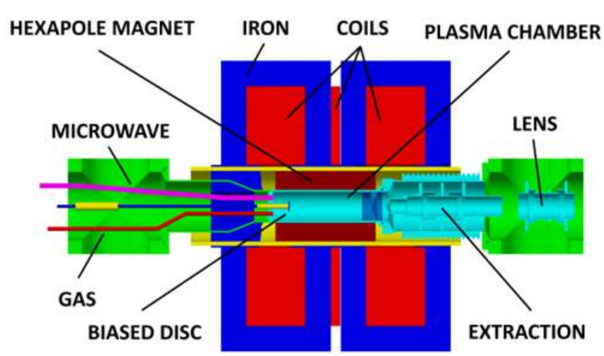

Figure 4: Schematic representation of the ECR ion source at ATOMKI

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

CLEAR: CLUSTER of LOW ENERGY ACCELERATORS for RESEARCH

The consortium has a common Program Scientific Committee, which selects the proposals to be carried out in the three facilities, and allocates the transnational funds. The committee meets after the open calls, which are held three times a year. The information of the open calls, as well as the experiments selected are available on the CLEAR web page. Some examples of research associated with the EURO-LABS funded proposals are described below.

CLEAR-CNA used its 3 MV Tandem to characterize novel He-rich targets, which are then used in other EURO-LABS facilities such as ISOLDE and LNL for astrophysical applications. The AMS system was employed to determine traces of trans-uranid isotopes, which allow to determine the impact of human produced radioactivity in the Baltic area.

CLEAR-ATOMKI used the ECRIS with a novel diagnostic setup – combining a 400 µm Pb pinhole, a 4 MP X-ray CCD camera (0.6-30 keV range), and a millisecond-resolution X-ray shutter. Coupled with single photon counting algorithm and advanced trigger systems, this enabled energy-, space-, and time-resolved X-ray spectroscopy to study plasma transients, including ignition, afterglow decay, and turbulence. The obtained results highlight the broad potential of X-ray diagnostic techniques for applications in ECRIS operation and plasma physics research.

Figure 5: Nuclear microprobe at IST

CLEAR-IST used the nuclear microprobe to determine the elemental composition, including trace elements, of different samples, such as phosphogypsum (a by-product from phosphoric acid production), CdZnTe and CdZnSeTe semiconductors (for radiation detectors) or bismuth chalco-halide solid solutions, to tailor optoelectronic properties for energy applications. Also, ion beam techniques were very useful to study the side effects generated by high energy proton beam on cellulosic based materials and to check the thickness homogeneity of ^{208}Pb self supported targets.

Contact information

Joaquin Gomez Camacho, gomez@us.es
Sandor Biri, biri@atomki.hu
Victoria Corregidor, ctn.tecnico.ulisboa.pt
CLEAR web page:
https://institutional.us.es/clear

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

Training in spectroscopic methods and instrumentation

Araceli Lopez-Martens

The INTRANS service improvement subtask of EURO-LABS is dedicated to provide expertise on the optimal use of experimental setups for nuclear spectroscopy in the research infrastructures of EURO-LABS. Training and sharing knowledge in spectroscopic methods and instrumentation is a way to enhance the quality of the scientific output of the experimental programs carried out within EURO-LABS.

Because of their effective balance between high detection efficiency and high energy resolution, germanium detectors are the workhorse of nuclear spectroscopy for basic nuclear physics and nuclear astrophysics research but also for many applications (nuclear imaging and therapy, activation analysis, environmental monitoring, nuclear security,…). Germanium detectors are complex devices comprising one or more high-purity germanium (HPGe) crystals in a cryostat cooled at liquid nitrogen temperatures. They require high voltages of up to many kV to be applied to one or more electrodes as well as specific instrumentation and methods for signal processing, data acquisition and spectral analysis. Moreover, germanium detectors are fragile and expensive and require specific handling, maintenance and trouble- shooting diagnostics.

The **Hands-on training school on operation, test and repair of HPGe detectors** was held in Legnaro (Italy) in September 2024 and was specifically addressed to physicists, engineers and technicians involved in HPGe detectors in use in Europe, from the simple tapered single crystal to the more complex clusters of the Advanced GAmma Tracking Array (AGATA). This school included 10 different hands-on laboratories and led to the creation of a "HPGe experts community". The **Germanium detector school**, organized in Liverpool (UK) in April 2025, was aimed at postgraduate students, postdoctoral researchers and electronics engineers who are not experts in germanium detectors. The school gave an introduction to germanium detector systems and provided 4 practical training sessions in essential measurement techniques. An invited talk was presented by Michael Ginsz from Mirion Technologies, who discussed specialist detector manufacturing. AGATA is the largest European gamma-ray detector and its only

Figure 6: Group photograph at the 2024 Hands-on training school on operation, test and repair of HPGe detectors.

equivalent is GRETA in the USA. AGATA is used in experiments at both stable and radioactive ion beam facilities in Europe, to study the interactions of atomic nuclei as well as their structure as a function of angular momentum, isospin, and temperature at the

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

Training in spectroscopic methods and instrumentation

limits of their stability. AGATA is based on the principle of gamma-ray tracking, which is made possible by the advent of segmented high-purity germanium crystals, advanced digital electronics, and pulse-shape analysis. By using these technologies, the precise energy and 3-dimentional position of each of the interaction points of the Compton scattered gamma rays can be determined and gamma-ray tracking algorithms can be used to reconstruct the full energy and the first interaction point of the gamma rays that hit the spectrometer. The **AGATA Data Analysis schools** organized in Legnaro (Italy) in September 2023 and in Lyon (France) in January 2025 were dedicated to help young researchers and PhD students familiarize themselves with the complex AGATA data pipeline and efficiently process the data taken during experiments carried out with AGATA coupled to various ancillary devices. The schools lasted a week and focused on the analysis methods and tools that have been developed by the AGATA collaboration with lectures in the mornings and hands-on sessions in the afternoons.

Figure 7: Participants of the 2025 AGATA Data Analysis school in front of the servers of the CC-IN2P3, where a copy of all the AGATA data is stored.

Contact information

Araceli Lopez Martens
Araceli.lopez-martens@ijclab.in2p3.fr

More information on INTRANS activities at https://web.infn.it/EURO-LABS/intrans/

RaDIATE Collaboration Thermal shock studies

Frederique Pellemoine on Behalf of the RaDIATE Collaboration

As next-generation accelerator target facilities (High Energy Physics, Spallation Sources, …) become increasingly more powerful and intense, high power target systems face key technical challenges, such as radiation damage and thermal shock. These ultimately degrade the performance and lifetime of targets and have been identified as the leading cross-cutting challenges of high-power target facilities. In order to operate reliable beam-intercepting devices in the framework of energy and intensity increase for next generation accelerators, the RaDIATE Collaboration (Radiation Damage In Accelerator Target Environment) [1], established in 2012 and managed by Fermilab, brings together existing expertise in nuclear material and accelerator targets from 20 international institutions, including CERN, to execute a coordinated strategy for high power targetry R&D. In this context, several thermal shock studies were performed at CERN's HiRadMat (High-Radiation to Materials) facility, representing a key step towards improving our knowledge on target damage tolerance. Three experiments have been carried out so far. The first experiment HRMT-24, completed in 2015, successfully validated the Johnson-Cook strength model developed at Southwest Research Institute (SwRI) on beryllium S200FH (used for beam window material), providing a better confidence in simulating the thermal shock response of current and future S200FH beryllium components [2].

HRMT-43, completed in 2018, tested various materials (Be, C, SiC, Si, Ti and ceramic nanofiber). It was a first and unique test which included pre-irradiated specimens from high energy proton beam irradiation to identify thermal shock response differences between non-irradiated and previously irradiated materials. Real-time measurement of dynamic thermomechanical response of graphite helped to benchmark numerical simulations. HRMT-60, completed in 2022 with a significant support from EURO-LABS, tested about 120 specimens with non-irradiated (C, Ti, Be, novel materials, SiC-SiC, W) and pre-irradiated material (C, Ti, Be). Preliminary results shows that most of the specimen didn't present visible indication of beam damage except for the nanofiber specimen and Sigraflex (C) that was predicted through heat transfer simulations in nanofiber medias.

All samples have been sent to Pacific Northwest National Laboratory, USA, and Material Research Facility, Culham-UK, for further Post Irradiation Examination. The results will greatly improve our knowledge of thermal shock behavior in target materials and will guide for more robust design of next-generation accelerator target systems. All the results obtained during these 3 experiments benefit the different RaDIATE collaborators around the world.

RaDIATE collaboration has been researching radiation effects on design properties; identifying damage tolerance limits of material will be very beneficial for future generation accelerator development. A future test at the HiRadMat facility, planned in 2025, is under discussion to investigate the dynamic fracture toughness limits of target materials under beam pulse loading environment.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

RaDIATE Collaboration Thermal shock studies

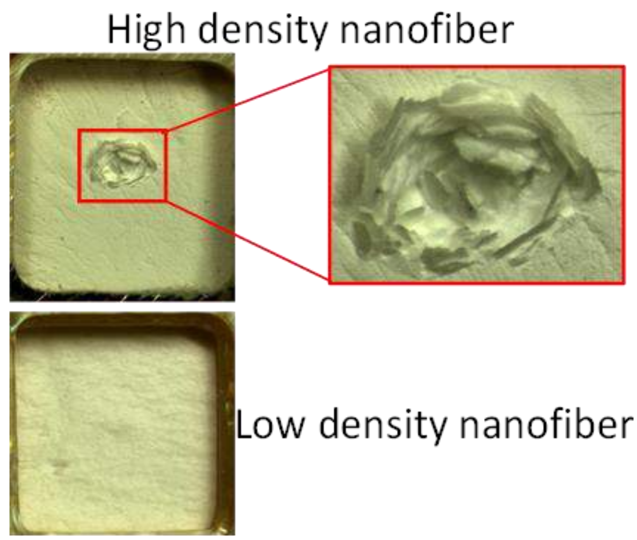

Figure 8: Left: HRMT-60 set up installed on HiRadMat beam line. Right: Damages observed from HiRadMat single pulse on ceramic nanofiber specimen. The high density nanofiber shows large damage while low density nanofiber shows no visible track of damage.

[1] www.radiate.fnal.gov
[2] K. Ammigan, S. Bidhar et al., PRAB 22, 044501 (2019)

Contact information

Frederique Pellemoine on Behalf of the RaDIATE Collaboration,
Fermi National Accelerator Laboratory,
fpellemo@fnal.gov

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

Irradiation to extreme fluences

Igor Mandić

Radiation damage is a major challenge for using silicon detectors in charged particle tracking at high-energy physics experiments. A key performance-degrading effect is the displacement of silicon atoms by neutrons, protons, or other high-energy particles. This displacement damage is proportional to the particle fluence and is typically expressed as the equivalent fluence (Φ_{eq}) of 1 MeV neutrons causing the same effect. Silicon detectors in the innermost layers at High Luminosity Large Hadron Collider (HL-LHC) experiments must withstand up to $\Phi_{eq} = 2\times10^{16}$ cm^{-2}. Achieving this radiation hardness required decades of research, including extensive irradiations using various sources. One such source is the 250 kW TRIGA reactor at the Jožef Stefan Institute (JSI) in Ljubljana, Slovenia, where neutron irradiations are performed. Neutrons play a major role in displacement damage in silicon in particle physics experiments. The Ljubljana reactor is a key facility for studying radiation effects in particle detectors, with EURO-LABS providing TA for irradiations under WP4.

As outlined in the Newsletter issue No.3, the 2020 European Strategy for Particle Physics (ESPP) proposes that Europe's next collider be an electron-positron Higgs factory, followed in the longer term by a high-energy proton-proton collider (FCC-hh). At FCC-hh, the most exposed silicon detectors will have to endure fluences up to 1×10^{18} cm^{-2}. This radiation level is considered extremely high, and current detector technologies cannot operate under such conditions. Little is known about silicon detector behavior after such intense irradiation.

Although FCC-hh may seem far in the future, detector development takes decades, making early research essential. Irradiations to extreme fluences are part of the WP4 program, with the first such irradiation carried out at the JSI reactor in August 2024.

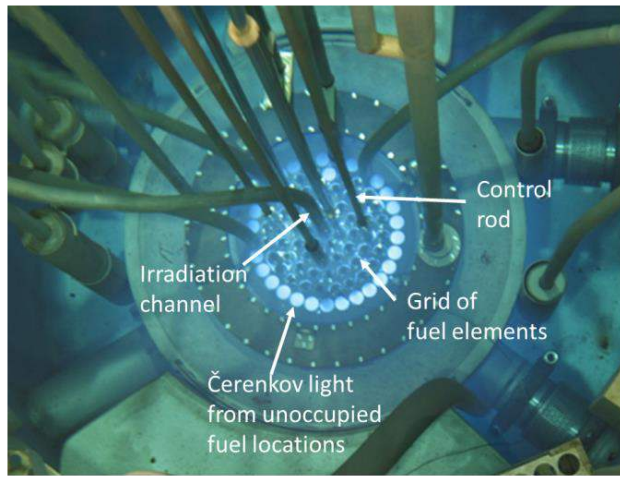

Figure 9: Photo of the reactor core at full power.

To irradiate samples with neutrons, they are inserted into the reactor core through irradiation channels (see Figure 9). The core is submerged in 5 meters of water, which serves as both a neutron moderator and radiation shield. Samples are placed in aluminum irradiation containers (Figure 9) and lowered into the core through the channel. Once in the core, they are exposed to neutrons. The highest neutron flux at the JSI reactor is $\varphi_{eq} = 6.7\times10^{12}$ cm^{-2}s^{-1} at the core center. Reaching $\Phi_{eq} = 1\times10^{18}$ cm^{-2} requires at least 40 hours of irradiation—equivalent to five full days of continuous reactor operation for a single container. Due to the reactor's busy schedule, such long irradiations must be planned well in advance and cannot be performed frequently. For the 2024 campaign, samples were provided by 12

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

Irradiation to extreme fluences

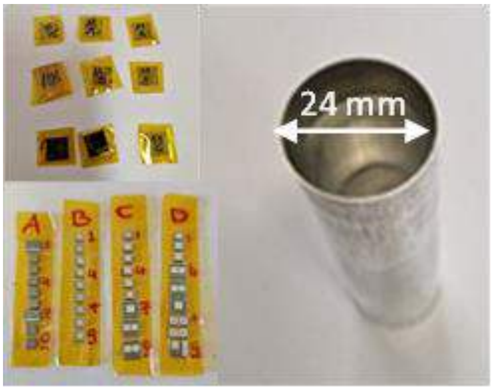

Figure 10: Various detector structures placed into the container.

groups collaborating with institutions across Europe, the USA, and China. These included structures made of Si, SiC, ZnTe, and GaN. Only small, bare sensor samples were accepted. All samples were placed in a single container and irradiated together (see Figure 10). The long irradiation led to significant sample activation, requiring special handling and extended cool-down periods. Nevertheless, most samples were distributed to test sites by November 2024.

Among the irradiated silicon structures were trench 3D detectors. In 3D technology, electrodes are formed in holes etched through the silicon – see Figure 11. Unlike planar detectors, 3D designs allow electrode spacing to be smaller than the wafer thickness, which is advantageous under high radiation damage, where charge carrier trapping times are very short.

As shown in Figure 11, there is almost no difference between the charge collection distributions measured before and after irradiation to $\Phi eq = 1\times10^{17}\ cm^{-2}$—a truly remarkable result. In laser Transient Current Technique (TCT) measurements with 3D trench detectors, responses were recorded

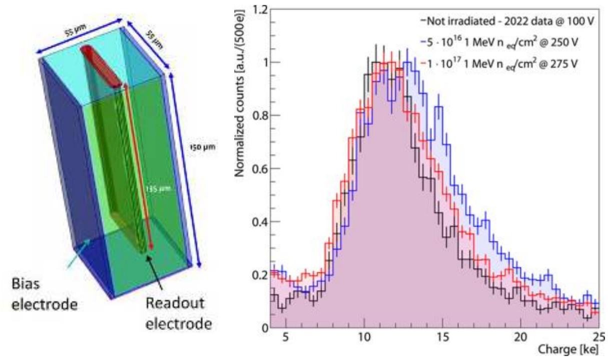

Figure 11: Scheme of trench 3D detector structure (left). Distribution of collected charges measured in the test beam before and after irradiation (right). From [1].

with devices irradiated to $\Phi eq = 5\times10^{17}\ cm^{-2}$ and even $\Phi eq = 1\times10^{18}\ cm^{-2}$ [2]. These are very promising first steps toward developing detectors for FCC-hh. The next extreme-fluence irradiation is planned for October 2025, and we look forward to more exciting results.

References

[1] M. Addison et al., "Characterisation of 3D trench silicon pixel sensors irradiated at 1·1017 1 MeV neq cm−2" https://doi.org/10.3389/fphy.2024.1497267
[2] A. Lai, "Could we efficiently operate 3D silicon pixel-based tracking detectors irradiated with neutron fluences up to 1E+18 1 MeVneq/cm2", Presented at VCI2025, https://indico.cern.ch/event/1386009/contributions/6279107/attachments/3018194/5324038/3D10e18_VCI2025_ALai.pdf

Contact information

Igor Mandić, Jožef Stefan Institute, Ljubljana, Slovenia
igor.mandic@ijs.si

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

CERN's Advanced Training School on Operation of Accelerators – ATSOA 2025: A Hands-On International Learning Experience, May 12-16, 2025

Maria-José G. Borge and Ilias Efthymiopoulos

The second edition of CERN's Advanced Training School on Accelerators (ATSOA25) took place in spring 2025, bringing together nineteen early-career scientists and engineers from ten different countries for an intensive, week-long training on accelerator science and operations. Organized under the EURO-LABS project and hosted at CERN, ATSOA offered a unique learning experience that combines introductory academic lectures, practical hands-on sessions, and direct access to beam operations at four different CERN facilities. The school was designed to provide participants with foundational knowledge of high-energy accelerator systems and exposed them to real-world challenges in their daily operation.

A Structured Week of Immersive Learning

The school began on Monday morning with a series of introductory sessions. After a welcome and an overview of the CERN accelerator complex and the school goals and organization by Ilias Efthymiopoulos, participants received detailed introductions to each facility featured in the program:

PS Booster (PSB) – Presented by Foteini Asvesta and Tirsi Prebibaj, offering insights into its four-ring design and beam cycle optimization.

ISOLDE – Introduced by Alberto Rodríguez, and Miguel Lozano, focusing on its role in producing radioactive ion beams for nuclear physics and related research.

ELENA – Described by Davide Gamba, and Laurette Ponce, who explained the intricacies of deceleration and electron cooling of antiprotons for low-energy experiments.

CLEAR – Presented by Pierre Korysko, and Roberto Corsini, with a focus on high-energy electron beams and their applications in accelerator R&D. These introductory lectures laid the groundwork for the practical component of the school. The trainees were divided into four groups, each spending one and a half days at a primary facility—from Monday afternoon through Tuesday—and then rotating to a second facility from Wednesday morning through Thursday. During these hands-on sessions, students mentored by the facility experts worked directly with beam parameters, control systems, and operational procedures, gaining first-hand experience in real accelerator environments. On Wednesday afternoon, all participants visited the two remaining facilities not assigned to their hands-on blocks, ensuring full exposure to all four accelerator facilities.

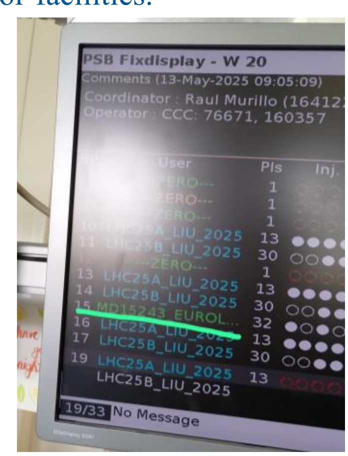

Figure 12: The EURO-LABS dedicated cycle in the PSB fixed display.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

CERN's Advanced Training School on Operation of Accelerators – ATSOA 2025: A Hands-On International Learning Experience, May 12-16, 2025.

Student Reports and Reflections

The final day, Friday, was dedicated to preparing and delivering summary presentations. Each group shared their main takeaways, challenges encountered, and the relevance of the experience to their future work. These presentations were not only a wrap-up exercise but also a platform for exchange and networking between the participants and CERN experts.

Figure 13: Trainees at the AD/ELENA control room

Feedback from trainees highlighted the value of combining theoretical lectures with hands-on training, as well as the rare opportunity to interact directly with operating accelerators. Many expressed interest in returning to CERN for further training or collaboration.

A Glimpse Behind the Scenes

In the accompanying images, you can see the trainee groups working in the facility control rooms and beamlines. These hands-on sessions are a hallmark of ATSOA25 and reflect its practical, experience-based approach.

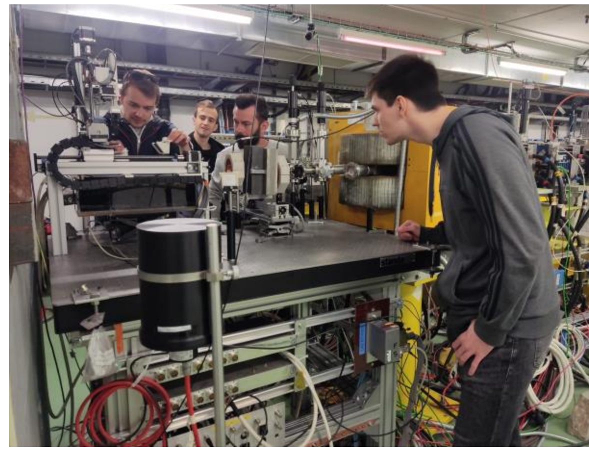

Figure 14: at the CLEAR beam line

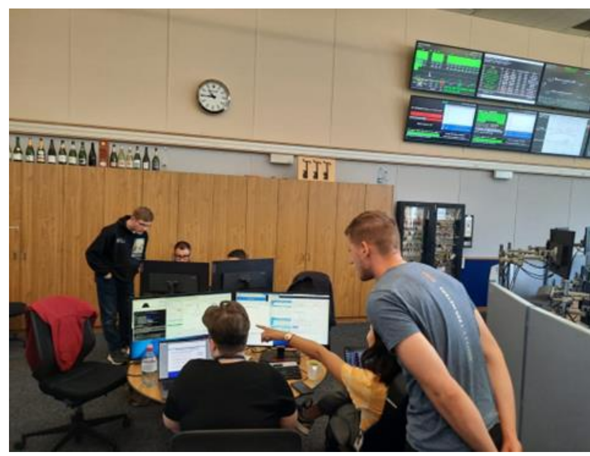

Figure 15: at the CERN Control Center–PSB

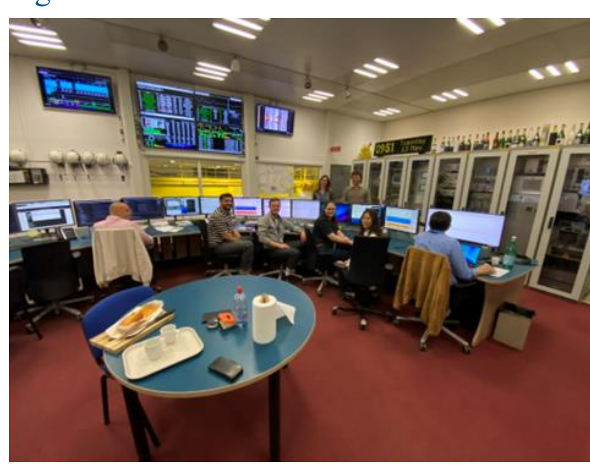

Figure 16: at the AD/ELENA control room

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

CERN's Advanced Training School on Operation of Accelerators – ATSOA 2025: A Hands-On International Learning Experience, May 12-16, 2025.

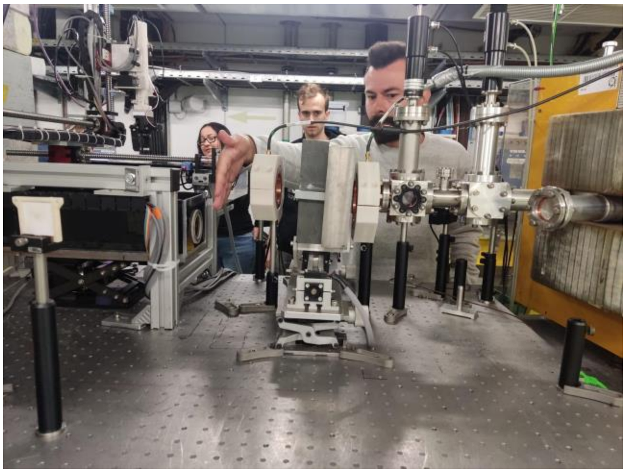
Figure 17: at the CLEAR beam line

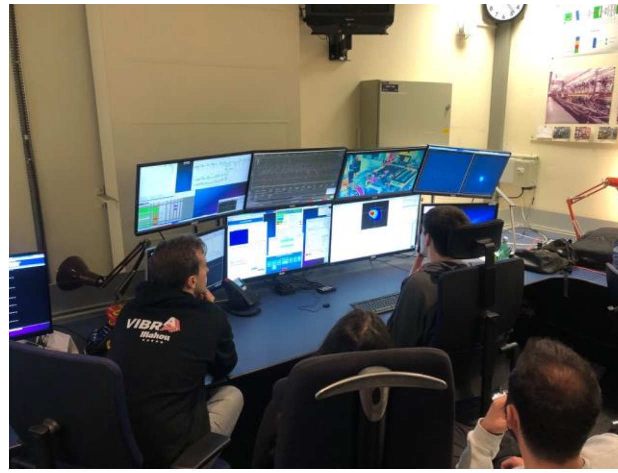
Figure 19: at the CLEAR control room


Figure 18: at the ISOLDE control room

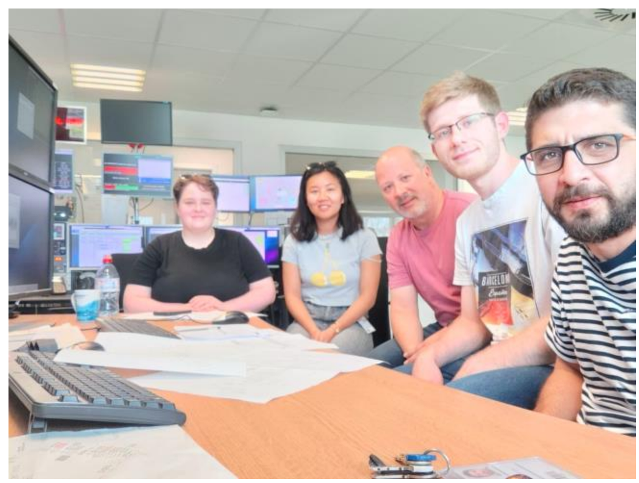
Figure 20: at the ISOLDE control room

Contact information
Maria-José G. Borge
mj.borge@csic.es

Ilias Efthymiopoulos
Ilias.Efthymiopoulos@cern.ch

For more details on ATSOA 2025, please visit: https://indico.cern.ch/e/atsoa2025

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.

FAME 2025: EURO-LABS Fourth Annual Meeting Heads to Ljubljana

We are pleased to announce that the **Fourth Annual Meeting of EURO-LABS (FAME)** will take place at the Jožef Stefan Institute in Ljubljana, Slovenia, from 29th September to 1st October 2025.

Following the tradition of previous gatherings, FAME 2025 will serve as a pivotal moment to reflect on the progress of the EURO-LABS project, showcase recent achievements, and align on strategic goals for the final year. This year's meeting will place a strong emphasis on the presentation and discussion of recent results stemming from the use of Transnational Access (TA) facilities—highlighting the tangible impact of collaborative research across Europe.

We look forward to welcoming all participants to Ljubljana for what promises to be an inspiring and productive meeting. **Mark your calendars and prepare to contribute to shaping the Fourth Annual Meeting of EURO-LABS**!

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101057511.