



**CERENA**

Centro de Recursos  
Naturais e Ambiente

# NEWSLETTER

OCTOBER 2025

**Science in motion:  
highlights from our  
events, labs, and  
people**

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# September Events Highlights

## CERENA Seminar : The Modern Mining Engineering Transformations

On 25 September 2025, CERENA hosted a seminar exploring the transformative role of digital innovation in Mining Engineering. The session focused on how Industry 4.0 technologies, including artificial intelligence (AI), data analytics, automation, and the Internet of Things (IoT) are reshaping the mining value chain by enhancing efficiency, safety, and sustainability.

Professor [Amílcar Soares](#) presented on the application of spatial data science for mineral resource prediction and the integration of risk into production scheduling through stochastic mine planning. His insights highlighted the power of data-driven approaches in resource estimation and operational decision-making.

Eng. António Salvador discussed the digitization of underground mining operations, emphasizing how smart technologies can improve safety and productivity. His talk covered key aspects such as communication systems, automation, and the role of IoT in creating more competitive and economically viable mining environments.





# September Events Highlights

## CERENA at NEI2025: Science in Action for a Sustainable Future

As part of the European Researchers' Night 2025 (NEI2025), held on September 26<sup>th</sup>, CERENA actively engaged the public across three venues – Marina de Oeiras, the National Museum of Natural History and Science, and the Jardim do Príncipe Real.

Throughout the day, visitors were invited to explore science and innovation through interactive activities:

- “Scars of a Fire: Tales in the Stone” – showcasing how understanding the impact of fire on stones can help protect historic buildings and cultural heritage.
- “Processing Rare Metals” – a hands-on experiment revealing how critical raw materials are separated and concentrated, underlining their importance in driving the energy and climate transition.
- “Clima Tic Tac” – an interactive game designed for children, raising awareness about global warming in a playful yet meaningful way, encouraging reflection on climate challenges and sustainable actions.
- “From Waste to Resource: What We Leave Behind” – demonstrating how waste can be transformed into valuable resources through reuse and innovation, reinforcing the idea that individual choices shape a more sustainable future.

CERENA warmly thanks all team members, including members and students, for their dedication and excellent work in making this initiative a success.



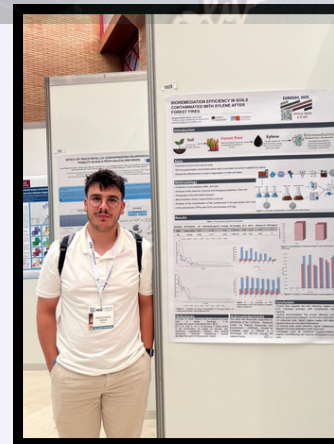


# News about CERENA's community

## CERENA Student Presents Research at Eurosoil 2025 in Seville

From September 8<sup>th</sup> to 12<sup>th</sup>, **Gonçalo Pereira**, a master's student from FEUP, participated in the **VII Eurosoil 2025 & X Iberian Congress of Soil Science**, held in Seville, Spain. During the event, he presented a poster based on his master's thesis, titled **"Bioremediation Efficiency in Soils Contaminated with Xylene After Forest Fires."**

Gonçalo described the experience as a milestone in both his academic and personal journey, highlighting the opportunity to engage with researchers from diverse scientific backgrounds and countries such as Chile, Turkey, Iceland, Spain, and Italy. He expressed his gratitude to his supervisor, Professor [Maria Cristina Vila](#), to his host laboratory CERENA – Centro de Recursos Naturais e Ambiente, and to the Faculty of Engineering of the University of Porto, for supporting his participation in this international event.



## Information for all

### EQUIPAR+2: National Investment for the Strengthening of Scientific Equipment in R&D Units

CERENA submitted an ambitious proposal under FCT's EQUIPAR+2 call with a budget of approximately 2.2M€. Our proposal follows the strategic plan for 2025–2029 and aims to strengthen and increase CERENA's laboratory facilities in its three host institutions across our three main scientific areas: environment, raw materials and energy.

## Key Dates & Events – October Highlights

- **27<sup>th</sup> and 28<sup>th</sup> October** – PhD Open Days 2025, held at the Técnico Innovation Center (TIC), is organized by the Técnico Doctoral School, a key component of Técnico Lisboa  
<https://phdopendays.tecnico.ulisboa.pt/>
- **30<sup>th</sup> October** – CERENA Seminar, 12:30, IST (Central Building) – Room C13 / FEUP – Room F405.  
Title: Applied Research and Development in Textile Industry: a traditional tool operating in an unfamiliar framework.  
Speakers: [Ana Clara Marques](#) (IST) / Rui Dias (Former R&D project leader at Fisipe)



# Pre-Award

## CERENA Community: September Submissions

Our community has returned from the summer break full of energy. In September alone, a total of 12 applications were submitted across different Horizon Europe opportunities, representing an approximate requested amount of over €4 million for CERENA.

- **5 MSCA Postdoctoral Fellowships** – These career development fellowships are designed to attract talented researchers currently abroad to continue their careers in Portugal, under the supervision of leading experts in top research fields. This year, our applicants were supported by four supervisors within the CERENA community ([Ana Clara Marques](#), [Leonardo Azevedo](#), [Ricardo Araújo](#) e [Rui Galhano](#))
- **2 large coordination proposals (Carbon4Fuel and NEXUS-PRO)** to Cluster 4 and Cluster 5, led by [Miguel Oliveira](#) (ISQ) in collaboration with IST-ID researchers.
- **2 partnership proposals** to Clusters 4 and 5 (**AI-ORACLE** and **MINIMINE**) coordinated internally by [Manuel Ribeiro](#) and [Helga Jordão](#) (including one 2-stage application).
- 1 Mission proposal, coordinated internally by [Maria Cristina Vila](#).

This active start demonstrates the ambition and collaborative strength of our community as we move into the final quarter of 2025.

## New Resource: Project Pre-Screening Guide

We are pleased to share a **new practical tool** that can help you prepare stronger Horizon Europe proposals: the **Project Pre-Screening Guide**.

Developed under the **NCP\_WIDERA.NET project**, this guide has just been updated to cover the **Work Programme 2025 calls**. For many of you, this will be the **first time accessing it** – and it can make a real difference in shaping competitive applications.

The guide is designed for **applicants, research managers, and support staff**, and helps you:

- **Decode** the Work Programme and proposal template.
- Access **key policy documents** directly linked to the calls.
- Use **step-by-step checklists** to ensure proposals are complete and compliant before submission.

 Access the updated guide [here](#)

SharePoint: [Pre Award](#) – You can learn more about funding, get involved in networking events, and connect to other relevant stakeholders.



# Inside Our Labs

## Gas Adsorption Analyzer- Fully Operational!



Our **Gas Adsorption Analyzer** (Autosorb 6100) is working best every day.

This technique allows you to determine the specific surface area of solid materials and analyze the pore size distribution for micro- and mesoporous structures.

Ideal for applications in catalysis, porous materials, adsorbents, and more.

To carry out your analysis, please provide the following sample information:

- Degassing temperature and time — must be below the material's degradation temperature. (If unknown, this can be determined via TG analysis.)
- Solvent-free — residual solvents may cause internal corrosion of the equipment.
- Sample quantity — only 50-100 mg is needed. (This is a non-destructive technique.)

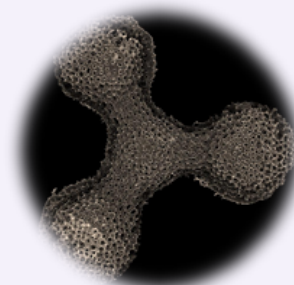
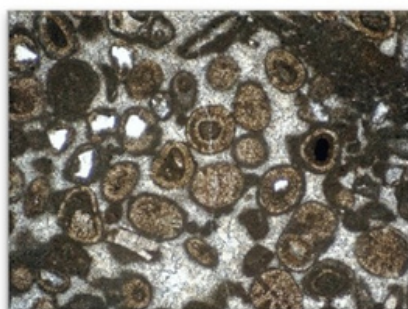
**Gas pycnometer** – An equipment to explore to support nondestructive characterization of your samples, the Gas Pycnometer is available for use. This instrument enables accurate determination of the density of powders and solids, as well as volume measurements based on gas displacement.

For further details on its capabilities and potential applications in your research goes to [+Gas pycnometer](#).



Both equipment are located at **ChemLab** (laboratory 0.6-2 at South Tower - IST).

A **new equipment is coming to MIL** — one that sees what others miss, revealing what lies just beyond the visible. Details will be revealed soon... stay tuned.





# Our Publications

1. Amorim, A., Filipe, R.M., Matos, H.A. (2025). [Analysis of integrated calcium looping alternatives in a cement plant](#). Chemical Engineering Science,313.
2. Marques, L.M., Mota, S.M., Teixeira, P. and 2 more (...) (2025). [Decarbonisation of cement industry: Calcium looping with white mud and limestone as CaO-based sorbents for industrial flue gas treatment](#). Chemical Engineering and Processing – Process Intensification,213.
3. Marques, L., Monteiro, M., Cenci, C. and 2 more (...) (2025). [Review of Post-Combustion Carbon Capture in Europe: Current Technologies and Future Strategies for Largest CO<sub>2</sub>-Emitting Industries](#). Energies,18(13).
4. Ferreira, L.F.V., Ferreira Machado, I., Gomes, R.V. and 2 more (...) (2025). [An Archaeometric Study of Twelve Porcelain Chinese Sherds Found at the Santana Convent in Lisbon—16th to 18th Centuries](#). Heritage,8(7).
5. Wang, N., Li, Y., Paneiro, G.A. and 7 more (...) (2025). [Distribution characteristics and value range of numerical simulation mechanical parameters in coal seam mining](#). Meitan Xuebao/Journal of the China Coal Society,50(7) 3400-3423.
6. Tiago, G.A.O., Martins-Dias, S., Marcelino, L.P. and 1 more (...) (2025). [Promoting LDPE microplastic biodegradability: The combined effects of solar and gamma irradiation on photodegradation](#). Journal of Hazardous Materials,492.
7. Nascimento, T., Ramos-Andrés, M., Galhano dos Santos, R. and 2 more (...) (2025). [A mild acidic oxidative process for lignin-derived functionalized monomers under catalyst, solvent, and pressure-free conditions](#). Biomass and Bioenergy,199.
8. Lobarinhas, R., Dionísio, A., Paneiro, G. (2025). [Unveiling the Fire Effects on Hydric Dynamics of Carbonate Stones: Leeb Hardness and Ultrasonic Pulse Velocity as Capillary Coefficient Predictors](#). Applied Sciences (Switzerland),15(15).
9. dos Reis Barradas, D., Pinto, M.L., de Pinho, M.N. and 1 more (...) (2025). [Adsorptive membranes of cellulose acetate CA/SiO<sub>2</sub>/UiO-66\(Zr\) for the removal of protein bound uremic toxins](#). Separation and Purification Technology,363.
10. Attaei, M., Condeço, J., Mateus, M.M. and 2 more (...) (2025). [Amine-based additives to enhance the carbonation rate of cement-based materials: A pathway to CO<sub>2</sub> neutrality](#). Journal of Cleaner Production,520.
11. Pacheco-Menor, M.C., Pereira, M.F.C., de Brito, J. and 1 more (...) (2025). [Diabase fine waste for its use in cement-based mortar: Technical remarks, characterization and benefits for the industry](#). Construction and Building Materials,489.
12. Milinovic, J., Santos, P., Marques, J.E. and 4 more (...) (2025). [Spectroscopic signatures for expeditious monitoring of contamination risks at abandoned coal mine sites](#). Geochemistry,85(3).
13. Figueiredo, F.M.J., Leal, J.P., Bordado, J. and 3 more (...) (2025). [A comprehensive review on Y and Eu recovery from cathode-ray tube phosphors](#). Resources, Conservation and Recycling,223.
14. Narciso, D.A.C., Sachio, S., Papathanasiou, M.M. (2025). [A novel framework for flexibility assessment in design spaces defined by a set of affine bounds](#). Computers and Chemical Engineering,200.



## New Members

CERENA is pleased to welcome three new PhD researchers and one Postdoctoral researcher who have recently joined our team:

### Waqar Ahmad

Marie Skłodowska-Curie Actions (**MSCA**) **Doctoral Networks Fellow** under the [CRITERIA](#) project, Waqar is currently conducting research at CERENA focused on sustainable resource engineering, real-time mining, and digital transformation for the extraction and processing of Critical Raw Materials (CRMs). He is supervised by [Helga Jordão](#).

### Jakub Skiba

Also an **MSCA Doctoral Networks Fellow** within the [CRITERIA](#) project, Jakub's research explores the optimization of mining activities through stochastic mine planning, with a focus on energy efficiency and the mitigation of socio-environmental impacts related to raw material extraction. He is supervised by [Leonardo Azevedo](#).

### Miguel Vitoriano Teixeira

**PhD student** under the [SIMIACCI](#) project, Miguel holds a Master's in Biomedical Engineering from the University of Aveiro. His research at CERENA centers on biomaterials for regenerative medicine, nanostructured materials for tissue healing, and biomedical applications of medical physics, building on his experience in material characterization and bioactivity assays. He is supervised by [Abeer Al Mohtar](#).

### Kjidaa Bouthanya

**Post-doctoral researcher**, working under supervision of [Maria de Lurdes Dinis](#), within the scope of the [ValorWaste](#) project.

Bouthayna holds a PhD in Physical Chemistry and Materials from Ibn Zohr University in Agadir, Morocco. Her doctoral research focused on the development of sustainable biomaterials for water treatment and environmental remediation, with a particular emphasis on the valorisation of marine waste.

## What's Coming Next – November Preview

- **27<sup>th</sup> November** – CERENA Seminar, 12:30, IST – Room C13 / FEUP – Room F405.

Title: To be confirm.

Speakers: [Henrique Matos](#) (IST) and Mário Jorge Pinho (Senior Consultant at Bondalti).



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Thank you for reading. Stay tuned  
for more updates in our next  
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Fundação  
para a Ciência  
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CERENA is financially supported by FCT -  
Foundation for Science and Technology  
under the project UID/04028/2025.