Facing the future
Navigating the challenges ahead

CERENA

Centro de Recursos
Naturais e Ambiente

Welcome to the seminar cycle '23/'24 entitled "Facing the Future - Navigating the Challenges Ahead." In an era of rapid change and uncertainty, anticipating and adapting to the challenges that lie before us is more crucial than ever. This series of seminars has been prepared to provide you with the insights and strategies that some of CERENA's researchers are developing to confront the evolving landscape of our world with confidence and resilience.

As we journey through this seminar cycle, we will dive into various topics, from technological advancements and environmental concerns to societal shifts and global developments. We will explore how these factors shape the future and, most importantly, how we can proactively engage with these changes to create a more promising tomorrow for yourself, your community, and future generations.

We invite you to embark on this journey with us not only to understand the challenges ahead but also to harness them as opportunities for growth, innovation, and future collaborations.

Joining us on this seminar cycle, let's face the future together!!!

The Organizing Comittee
Abeer Mohtar
Amir TavallaieNejad
Pedro Castro
Rui Galhano dos Santos

CERENA'S SEMINARS 23/24
October 26th '23 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

Automatic image processing for structural characterization of biofilms

"Programming as a tool to support laboratory work, promoting speed and objectivity in image processing and boosting R&D activities"

DIOGO NARCISO

Graduated in 2003 from Instituto Superior Técnico (Lisbon) in Chemical Engineering. Received his PhD degree from Imperial College London in 2009 in the field of Process Systems Engineering with a focus on optimization and control. From 2009-2014 worked as a Consultant at Process Systems Enterprise (London) on a wide range of projects dealing with the design, simulation, optimization, and troubleshooting of chemical engineering plants. In 2018, joined the Faculty of Engineering at Porto University, focusing on a variety of research subjects, including Energy Efficiency, Machine Learning and Data Analysis, Multiparametric Optimization, and Biotechnology (focus on developing algorithms for image processing). Since 2023, working as a teaching assistant, and as a researcher in the field of green ammonia.

Facing the future of stone-built heritage: Navigating the challenges ahead

"Stone-Built Heritage: working for sustaining the future"

AMÉLIA DIONÍSIO

Amélia Dionísio is Assistant Professor at Instituto Superior Técnico, Lisbon's University. Her research activity is mainly focused on building stone decay and also promotion of knowledge and sustainable economic value for natural stone. Her research interests concerns non-invasive diagnosis tools, water-rock interaction and microbe-mineral interaction. She has directed several master's and doctoral dissertations in the area of Conservation and Restoration of Stone Cultural Heritage. She is the author and co-author of several scientific publications, as well as a reviewer of scientific articles, in peer-review national and international journals.

CERENA'S SEMINARS 23/24
December 21th '23 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

Global Optimization of Quadratically Constrained Problems

"Do you want a good or the best solution to a complex optimization problem?"

PEDRO CASTRO

Pedro Castro is an Associate Professor at the Department of Chemical Engineering of Instituto Superior Técnico (IST), University of Lisbon (UL). His research interests are at the interface between Chemical Engineering, Industrial Engineering and Operations Research, known as Process Systems Engineering (PSE). He has tackled real-life industrial problems from a variety of sectors: pulp and paper; chemicals; cement and steel; plastics and petroleum. He is known for his mixed-integer linear programming (MILP) models and MILP-based algorithms for process scheduling and global optimization of non-convex problems with bilinear terms. These have been based on the Resource-Task Network (RTN), Multiparametric Disaggregation and Generalized Disjunctive Programming. A study by Stanford University listed him in 2023 as One of the World's top 2% Scientists Ranked 411 (5th in Portugal) in the subject field of Chemical Engineering.

CERENA'S SEMINARS 23/24
January 25th '24 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

Bio-based membranes for Hydrogen purification (BioMem4H2)

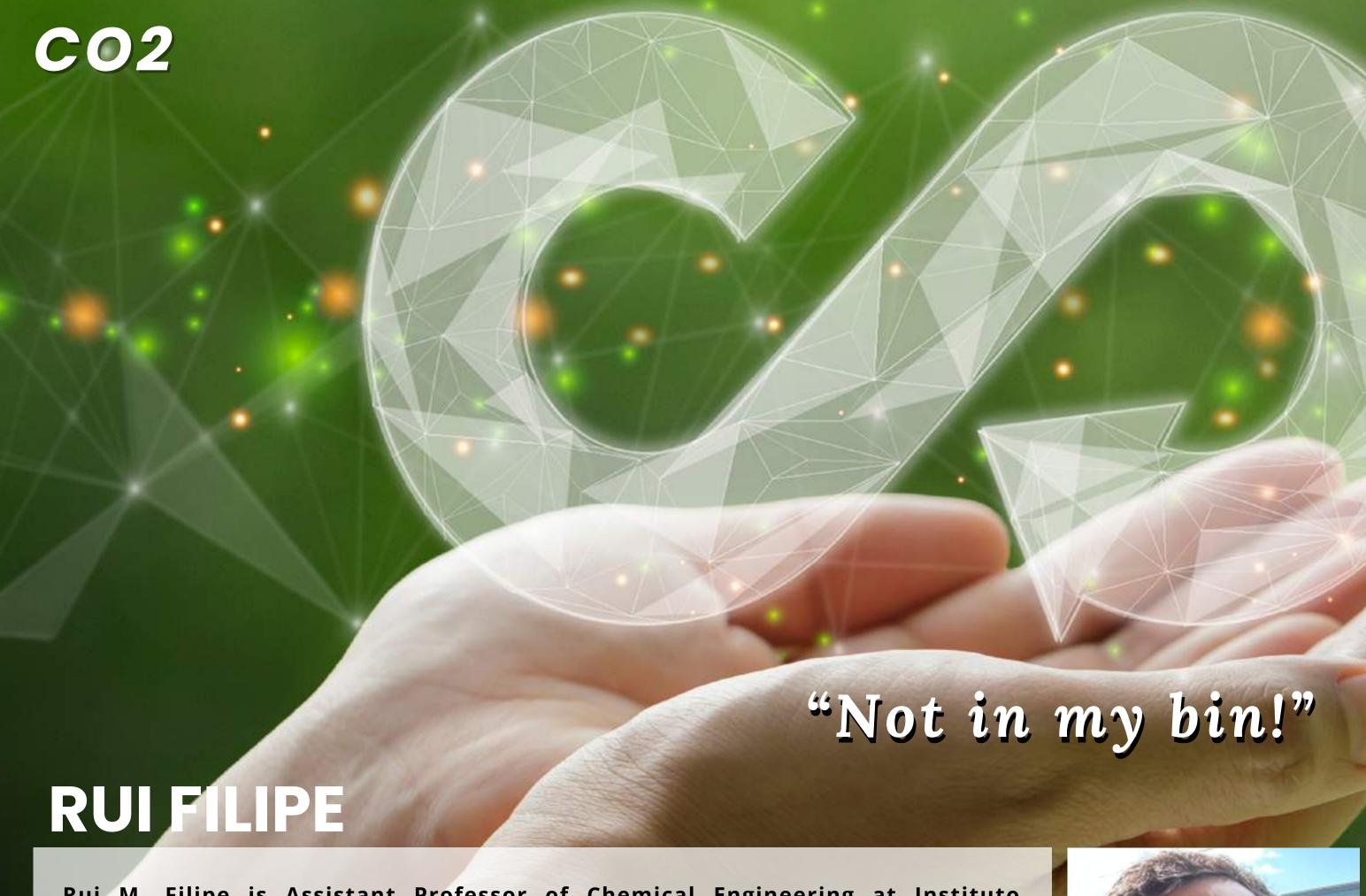*"Recycling and reusing materials for a more sustainable future"*

TÂNIA FRADE

Tânia Frade has a BSc in Technological Chemistry, a MSc in Chemistry and holds a PhD in Physical Chemistry from the Faculty of Sciences of the University of Lisbon. Her PhD work aimed to develop ZnO-based nanostructured materials to be applied in perovskite solar cells. She is currently a postdoctoral researcher at CERENA in Instituto Superior Técnico. Her research focuses on producing sustainable materials relying on the circular economy paradigm to achieve the highest value for assets and products. She works in the field of composite polymer materials as filling foam materials and in the field of adsorbent materials, particularly in the synthesis and characterisation of adsorbent materials for gas mixture separations.

CERENA'S SEMINARS 23/24
February 22th '24 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)2

Recovering value added products from waste biomasses: modeling oil extraction using supercritical CO2

"Not in my bin!"

RUI FILIPE

Rui M. Filipe is Assistant Professor of Chemical Engineering at Instituto Superior de Engenharia de Lisboa (ISEL) and researcher at CERENA. Graduated in Chemical Engineering (ISEL, 1993), he took his MSc in Sanitary Engineering at Universidade Nova de Lisboa in 1999, with a thesis on lake eutrophication modelling and simulation, and his PhD in Chemical Engineering at Instituto Superior Técnico in 2009, with a thesis on Synthesis and Design of Reactive Distillation Systems. His research interests includes modelling, simulation, optimization and control of chemical processes. Currently his research areas are: modelling, simulation and optimisation of supercritical CO_2 extraction; CO_2 capture using Ca-looping; and sustainability analysis.

CERENA'S SEMINARS 23/24

March 21th '24 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

DigitalStone: a new future for dimension stone valorisation

"Let's check out how deep learning can change the paradigm of raw materials valorisation, using a case study on dimension stones."

GUSTAVO PANEIRO

Assistant professor at the Department of Mineral and Energy Resources Engineering of Técnico Lisboa and researcher at CERENA, he is the PI of CERENA's project on the RRP agenda Sustainable Stone by Portugal, that counts with 53 entities, including industrial and technological companies. His main research interests are related with Rock Mechanics, particularly the use of Machine Learning and Deep Learning techniques for rock and rock mass characterization and modelling.

How to quantify sustainability indicators and targets in the supply of critical raw materials?

"Good practices make the future, let's deepen the sustainability assessment of critical minerals from the Earth's crust"

MARIA CRISTINA VILA

Maria Cristina Vila is Associate Professor in the Department of Mining Engineering at the Faculty of Engineering of the University of Porto, where she has been teaching since 1992. BSc in Geotechnical Engineering (1988) and Mining Engineering (1990) from the University of Porto. MSc in Technology and Management of Mineral Resources (1995) by FEUP/IST. PhD in "Soil rehabilitation observed through respirometry - signal analysis in biological systems" (2005) by FEUP. Her scientific research is focused mainly on: rehabilitation of contaminated soils; bioremediation; monitoring and environmental risk analysis; technologies and waste management of the extractive industry (waste and drainage mining); mineral biotechnology.

CERENA'S SEMINARS 23/24
May 23th '24 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

Challenges in energy accumulation and tunning renewable energy with consumer profiles

"Get ready to store electrical energy"

JOÃO GOMES

Academic background: BSc Chemical Engineering, IST/UTL; 1983, PhD Chemical Engineering, IST/UTL, 1999; Habilitation Chemical Enginering, IST/UTL, 2010. Present affiliations: Habilitated Coordinating Professor, Chemical Technology, Chemical Engineering Departamental Area, ISEL, Lisbon Polytechnic ; Senior Researcher, CERENA - IST/UL. Main research interests: Clean chemical processes; Clean energy and fuels; Heterogeneous catalysis; Nanotoxicology and particulate toxicology; monitoring and control of air pollution; CO2 capture. Relevant professional training: Process Simulation HYSYS and Super Pro Designer ; Global Environmental Issues ; Sustainability Assessment of Clean Air Technologies ; Environmental Impact Assessment ; Industrial Air Pollution ; Air Pollution Modelling and Software ; Measurement of gaseous pollutants ; Solid waste ; EEC Environmental Policy ; Industrial Energy Conservation ; Chemical reactor design and technology.

CERENA'S SEMINARS 23/24

June 27th '24 | 12:30
ROOM C13 (LISBOA)
ROOM F405 (PORTO)

Meeting the NORM challenges from different sectors – how to achieve radiological sustainability?
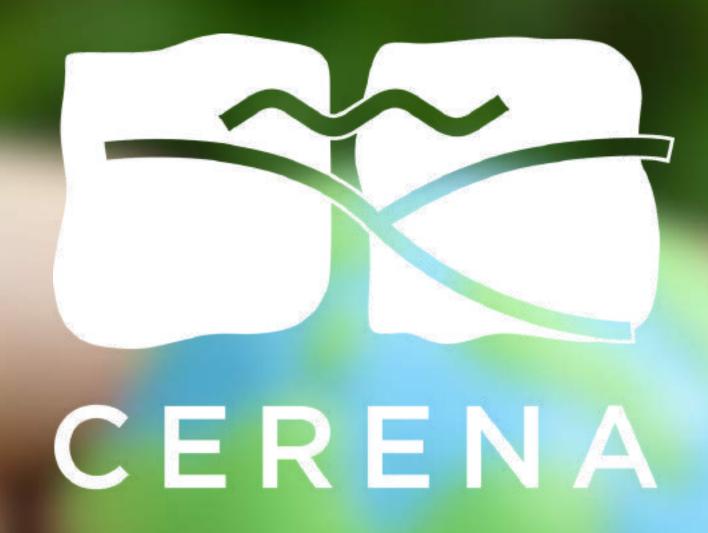
"A problem or a solution?"

MARIA DE LURDES DINIS

Maria de Lurdes Dinis is an Associate Professor at the Mining Engineering Department in the Engineering Faculty of Porto University, Portugal. She has a PhD and an MSc in Environmental Engineering from Porto University, a five-year study program in Mining Engineering and 25 years of experience in environmental issues related to radioactive contamination. She has more than 15 years of engineering education on environmental mining impact and environmental remediation. Her research activities have been focused on the environmental effects of uranium mining and environmental remediation. She has collaborated with NATO and the IAEA for several years with training programs and for the development of collaboration projects. She is the chair of the IAEA Network ENVIRONET, a member of the Advisory Board to the Section Head of Decommissioning and Environmental Remediation Section, Division of Nuclear Fuel Cycle and Waste Technology, Department of Nuclear Energy of the International Atomic Energy Agency and a member of the Advisory Board to the Euratom Supply Agency of the EU.

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