



Institute for
Sustainability and
Innovation in Structural
Engineering

ISISE Stats & Highlights

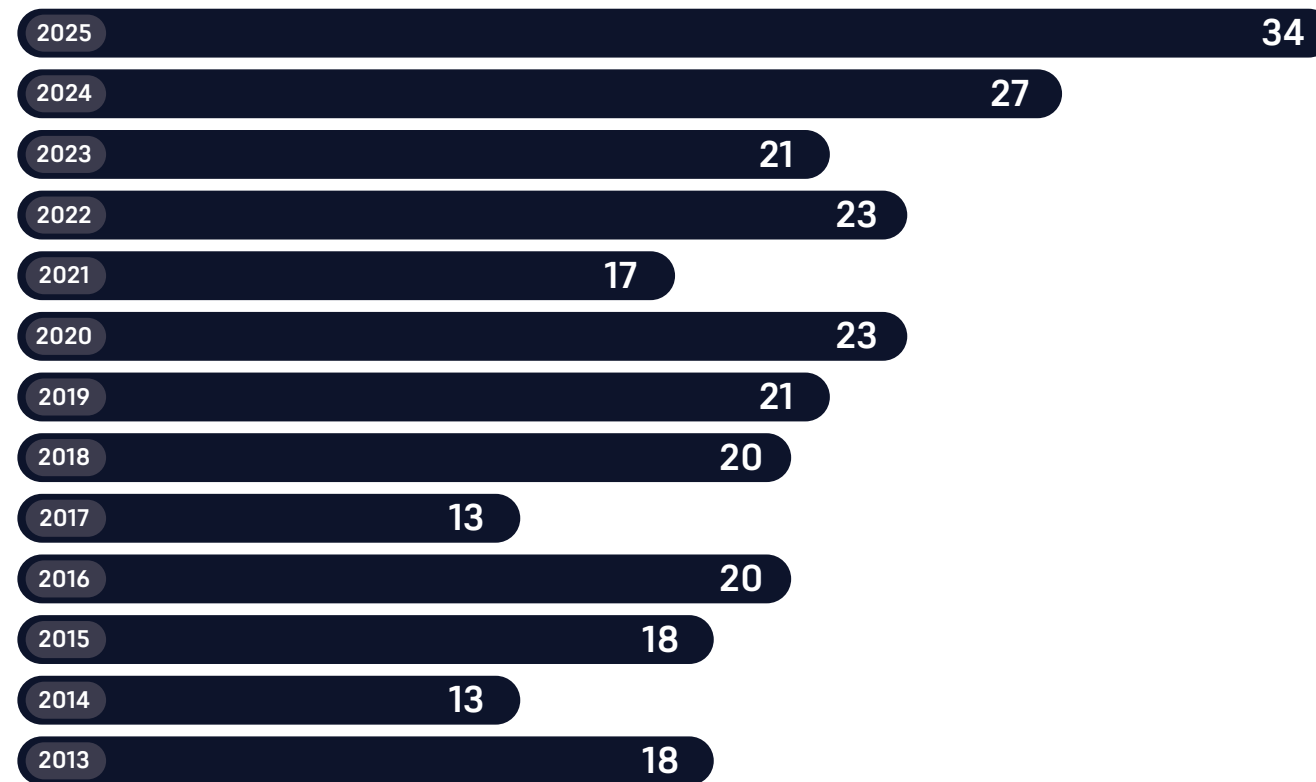
2025



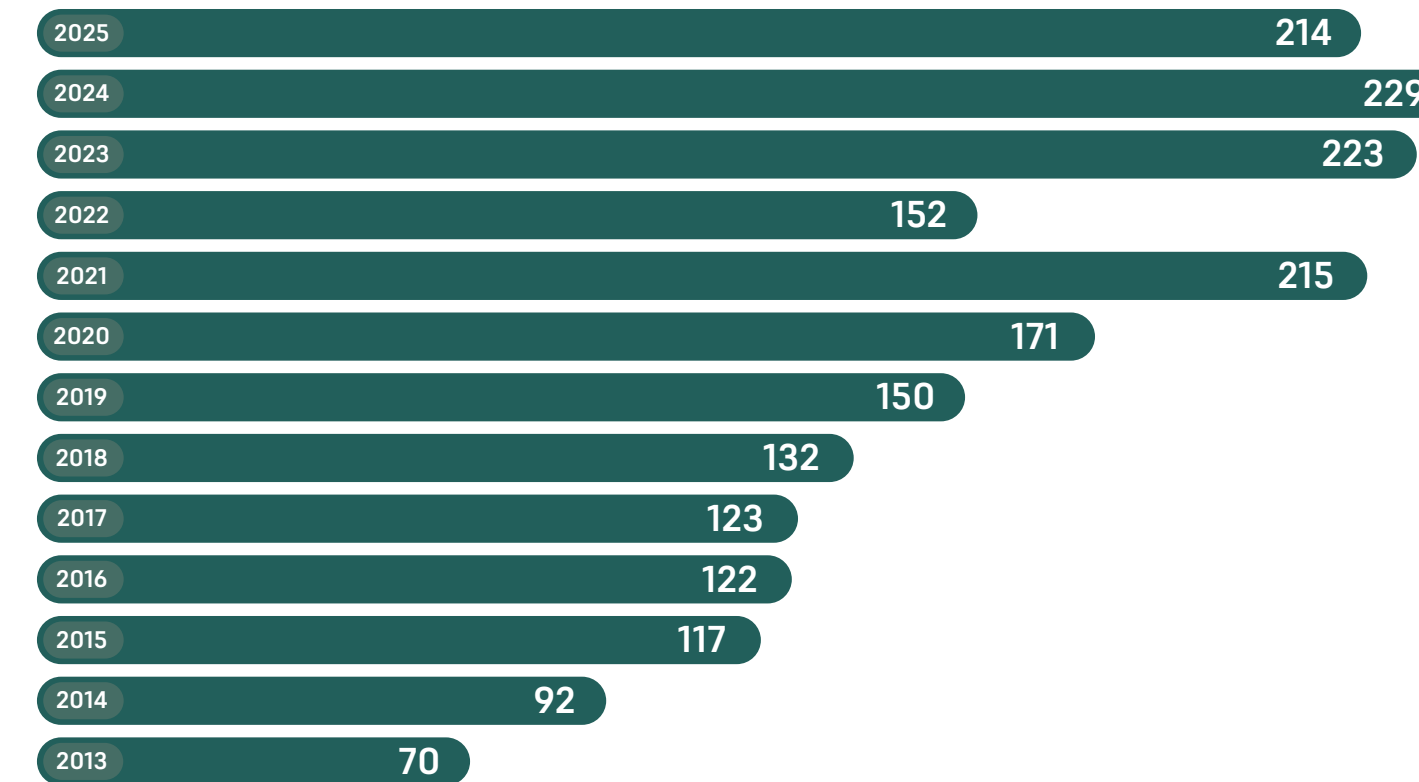
ISISE in Numbers



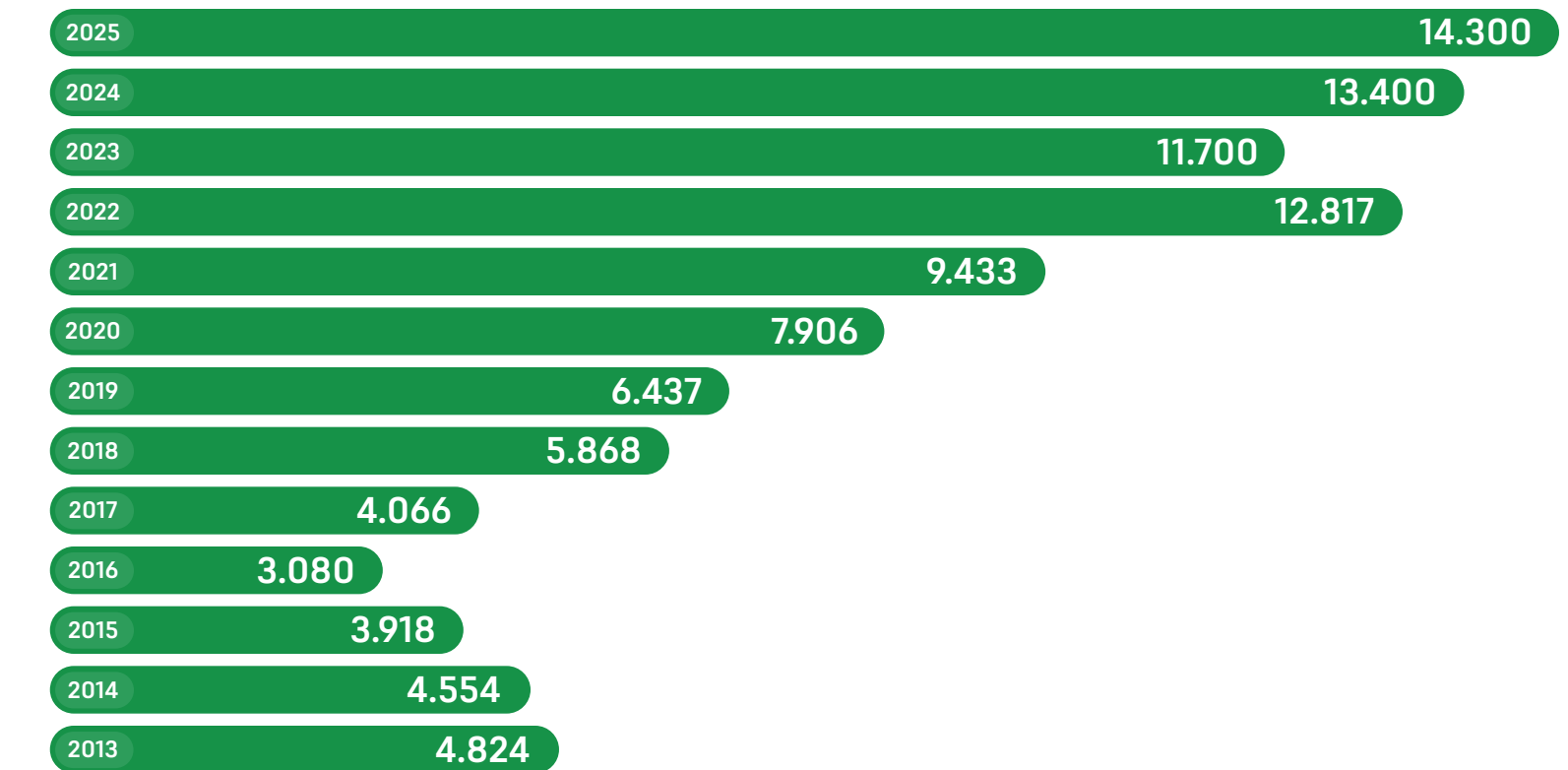
Concluded PhD Theses



Articles Published in WoS Journals

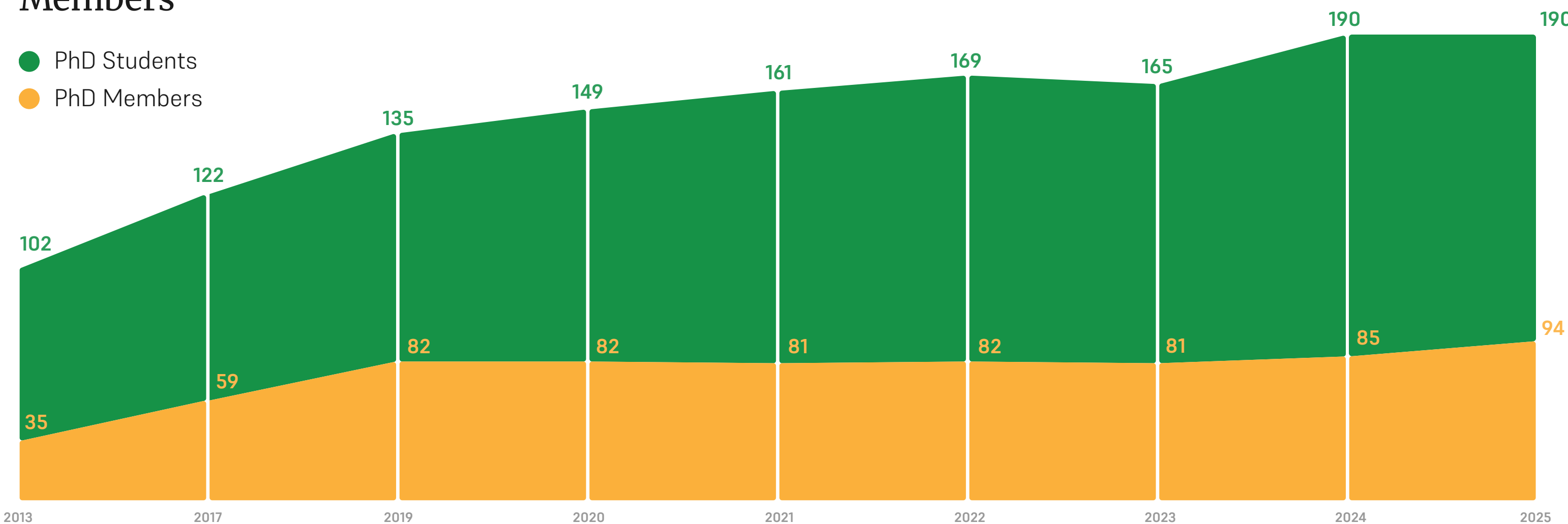


Contracted Project Funding (M€)

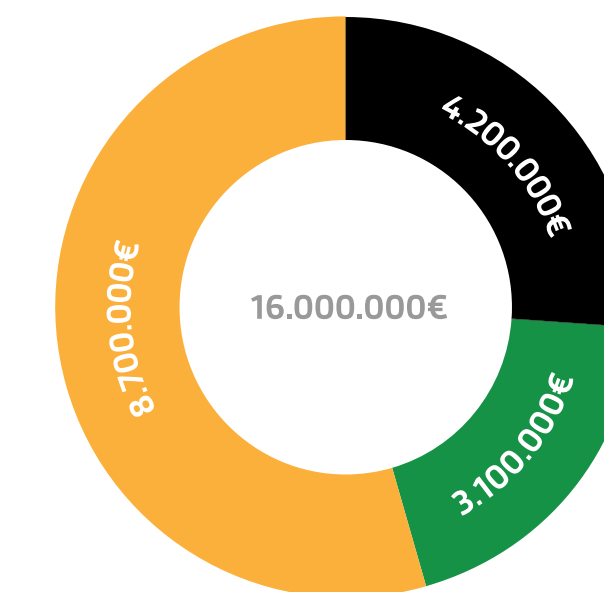


Members

- PhD Students
- PhD Members



Funding Distribution



- Portuguese Foundation for Science and Technology - FCT
- International sources
- Other national sources

International Alumni

MSc Alumni: 98 Countries (89% of the world population)

America

Argentina
Bolivia
Brazil
Canada
Chile
Colombia
Costa Rica
Dominican Republic
Ecuador
Guatemala
Haiti
Mexico
Nicaragua
Paraguay
United States of America
Venezuela

Africa

Algeria
Angola
Cameroon
Ethiopia
Ghana
Kenya
Liberia
Libya
Mauritania
Morocco
Nigeria
Somalia
Sudan
Tanzania
Tunisia
Zambia
Zimbabwe

Asia

Afghanistan
Bangladesh
Bhutan
China
India
Iran
Iraq
Israel
Japan
Jordan
Kazakhstan
Kyrgyzstan
Lebanon
Malaysia
Myanmar
Nepal
Pakistan
Palestine
Philippines
Singapore
South Korea
Syria
Thailand
Vietnam

Europe

Albania
Austria
Azerbaijan
Belgium
Bulgaria
Croatia
Czech Republic
Finland
France
Germany
Greece
Georgia
Hungary
Ireland
Italy
Lithuania
Macedonia
Moldavia
Netherlands
Poland
Portugal
Romania
Serbia
Slovakia
Slovenia
Spain
Sweden
Ukraine
United Kingdom

Oceania

Australia
New Zealand

Intercontinental States

Azerbaijan
Cyprus
Egypt
Indonesia
Turkey
Russia

PhD Alumni: 53 Countries (70% of the world population)

America

Bolivia
Brazil
Chile
Colombia
Costa Rica
Ecuador
Guatemala
Mexico
Peru
United States of America
Venezuela

Africa

Angola
Cape Verde
Ethiopia
Kenya
Morocco
Mozambique
Nigeria
Sudan
Tunisia
Rwanda

Asia

Afghanistan
China
India
Iran
Iraq
Jordan
Lebanon
Myanmar
Pakistan
Syria
Yemen

Europe

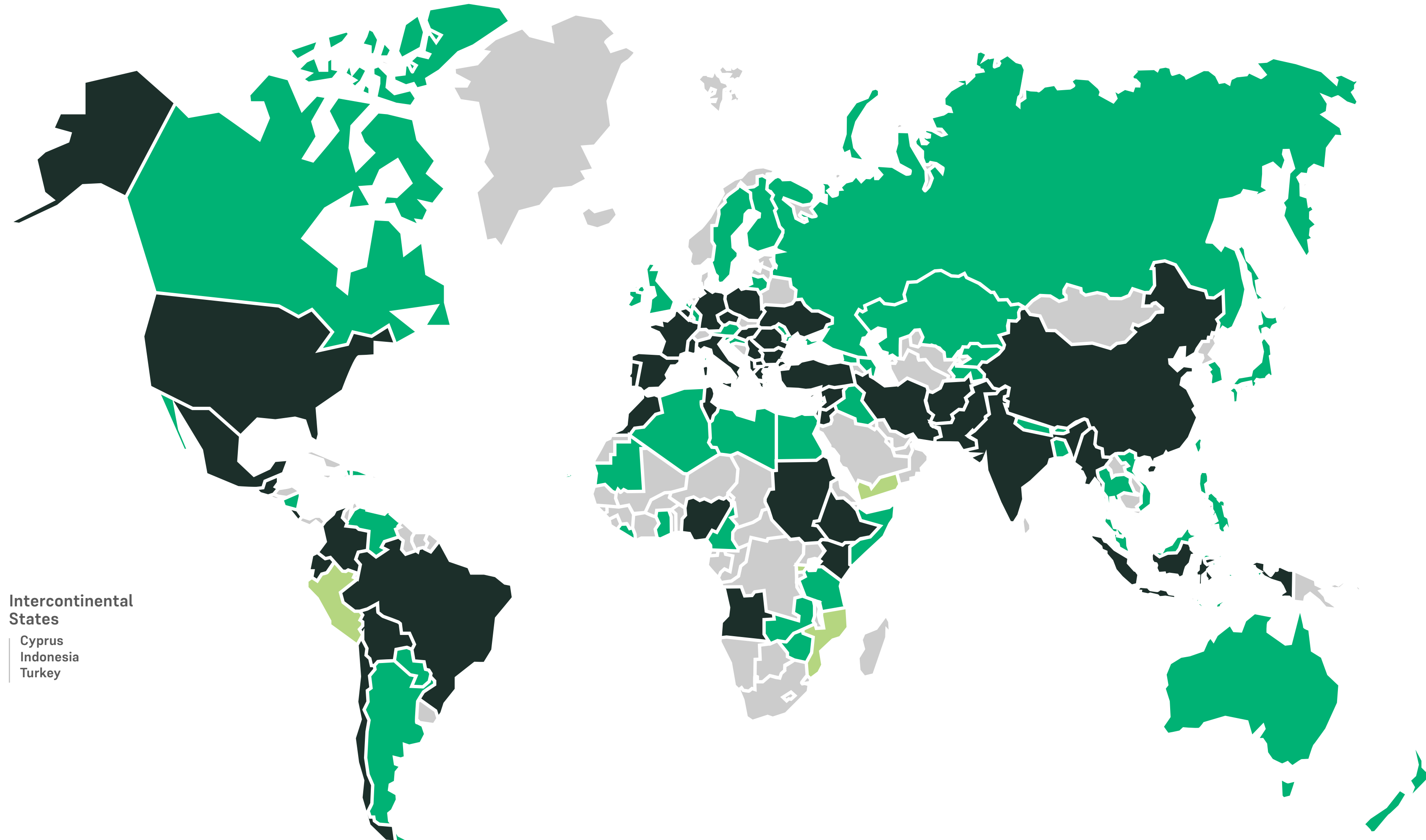
Albania
Belgium
Bulgaria
Croatia
Czech Republic
France
Germany
Greece
Hungary
Italy
Macedonia
Montenegro
Poland
Portugal

Romania
Serbia
Spain
Ukraine

Intercontinental States

Cyprus
Indonesia
Turkey

● MSc students ● PhD Students ● Both





ISISE

ISISE Has a New Face!

As part of an ongoing effort to strengthen its institutional identity and communication strategy, ISISE introduced a renewed visual image supported by a comprehensive set of communication materials aimed at improving consistency and visibility across scientific, institutional, and outreach activities.

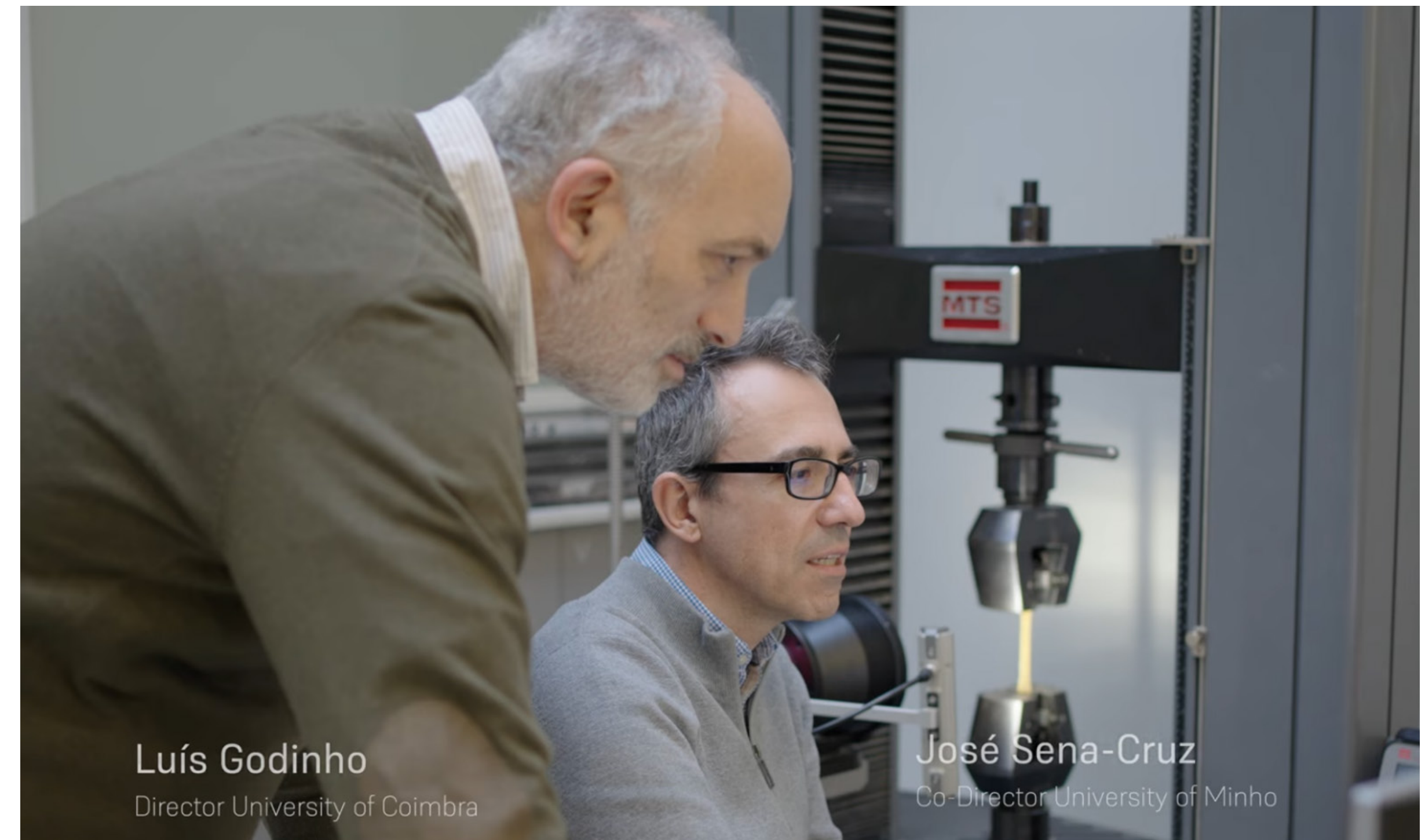
A central element of this initiative was the launch of new institutional videos, available in both long and short versions, presenting ISISE's mission, people, research areas, and societal impact. The videos showcase the institute's multidisciplinary work, highlighting research on advanced steel and composite construction systems, the behaviour and preservation of historical masonry structures, and the development of digital tools for asset management and resilience to extreme events, while also presenting its laboratories and collaborative research environment.

The rebranding process also included the introduction of a new ISISE logo and an animated version for digital media, together with a unified visual identity applied across dissemination materials.

New resources were made available to members, including standardized presentation templates and virtual backgrounds for online meetings, ensuring coherent institutional representation across events, teaching, and dissemination activities.

All dissemination materials are available on the ISISE website through the Dissemination Manual, while the institutional videos can be accessed in the Videos section.

This initiative reinforces ISISE's image within the scientific community, industry, and society, reflecting a shared vision and a strong commitment to impactful research and innovation.



Luís Godinho
Director University of Coimbra

José Sena-Cruz
Co-Director University of Minho



UC

XV Congresso de Construção Metálica e Mista e I Congresso de Engenharia de Fachadas

Last year marked the transition of the Conference on Steel and Composite Construction (CMM) from Coimbra to the SUPERBOCK Arena in Porto, where its XV edition was held jointly with the I Conference on Façade Engineering.

As in previous editions, the main objective of the CMM conference was to promote the most recent innovations and achievements in steel and composite construction, contributing decisively to the promotion, consolidation, and expansion of this sector. This edition placed special emphasis on the themes of *Energy and Artificial Intelligence*, reflecting emerging challenges related to sustainability, digitalization, and technological transformation within the construction industry. The I Conference on Façade Engineering complemented the programme by addressing topics of increasing relevance, highlighting recent developments and technical solutions in façade design and performance.

The event was organized by CMM Portuguese Association of Steel and Composite Construction, of which Professor Luís Simões da Silva has served as President since 2005, with the active involvement of ISISE members in both scientific and organizational activities.

The conference provided a privileged platform for knowledge exchange between academia and industry, fostering collaboration among researchers, designers, contractors, and manufacturers.

The conference reached an important milestone, gathering **954 registrations** representing **19 nationalities**, confirming its strong international dimension. The technical programme included **29 lectures, 5 workshops, and 47 technical-commercial sessions**, complemented by a large technical exhibition featuring **77 stands** and the support of **73 sponsors**, reinforcing the event's position as a key meeting platform for the steel and composite construction and façade engineering sectors.





UM

European Master in Earthen Architecture and Construction (TERRA)

PI: Daniel Oliveira

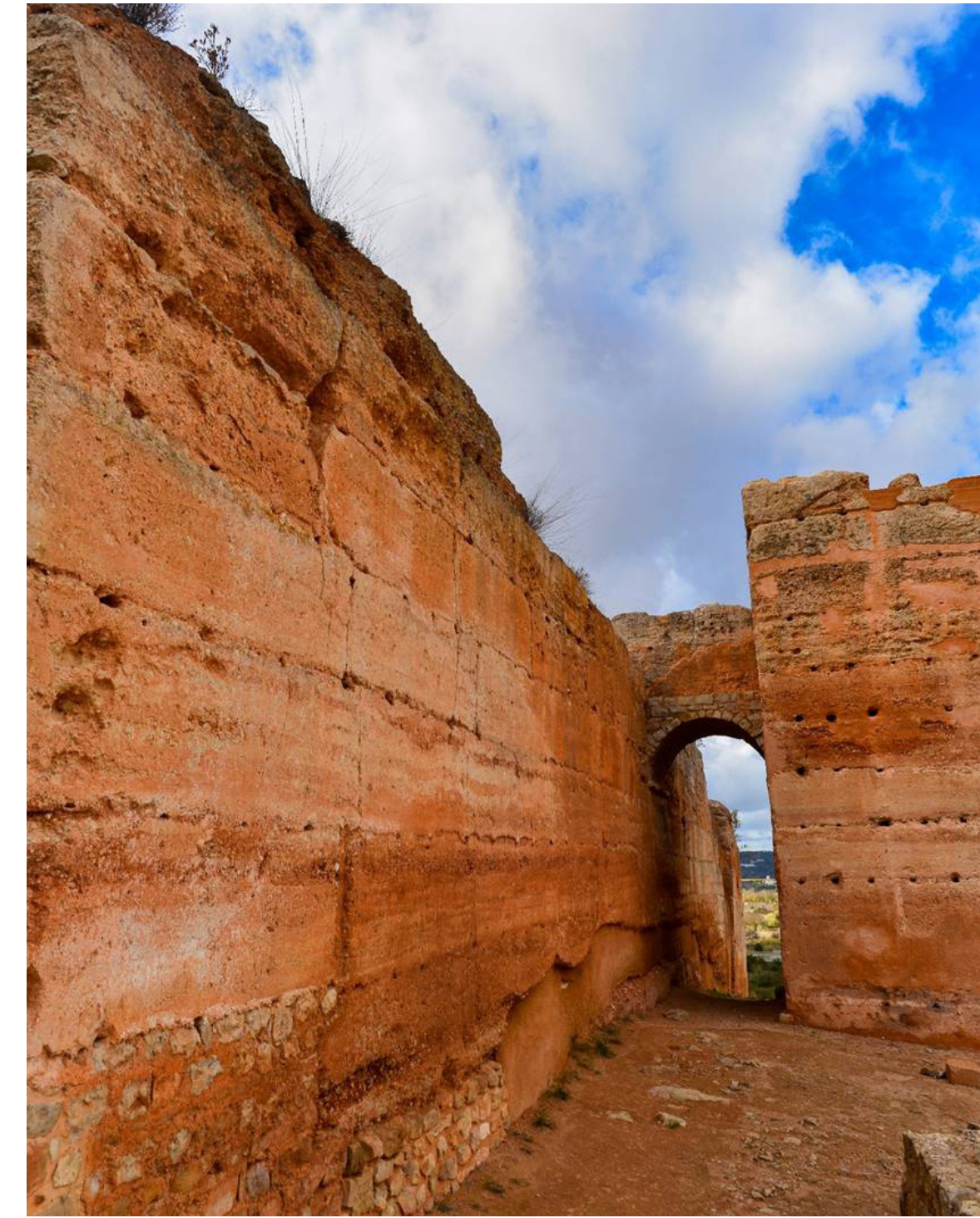
The European Master in Earthen Architecture and Construction (TERRA) is a unique programme dedicated to advancing knowledge and professional practice in earthen architecture and construction.



Its first edition will take place in the 2026/2027 academic year as a funded Erasmus Mundus Joint Master. Erasmus Mundus and Consortium scholarships are available for students of any nationality.

TERRA is a one-year full-time programme awarding a double Master's degree, jointly delivered by the University of Minho (Portugal), the Technical University of Valencia (Spain), the Graduate School of Civil, Environmental and Urban Engineering from the National School of Public Works (France), and the University of Florence (Italy). Students complete their coursework at one university and develop their dissertation at another. The language of instruction and examination is English.

The programme fosters a truly integrated approach between Architecture and Civil Engineering, grounded in a robust scientific foundation and aligned with the current global challenges in the construction sector. In addition to professional practice, graduates will be well prepared to pursue advanced research or doctoral studies in the field of Earthen Architecture and Construction. The curriculum combines traditional knowledge with cutting-edge scientific and technological advancements.



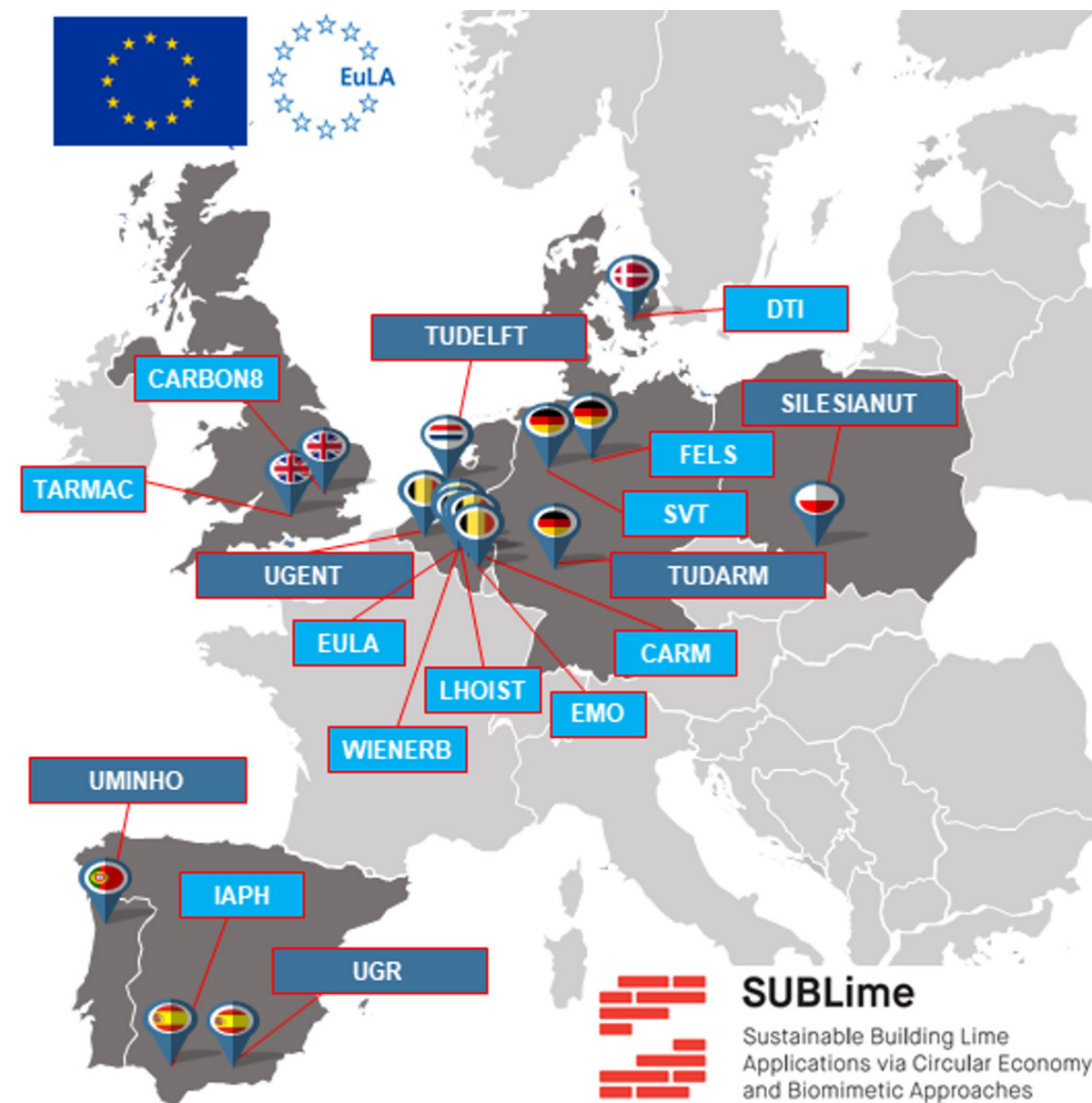
HMS



SUBLime: Sustainable building lime applications via circular economy and biomimetic approaches

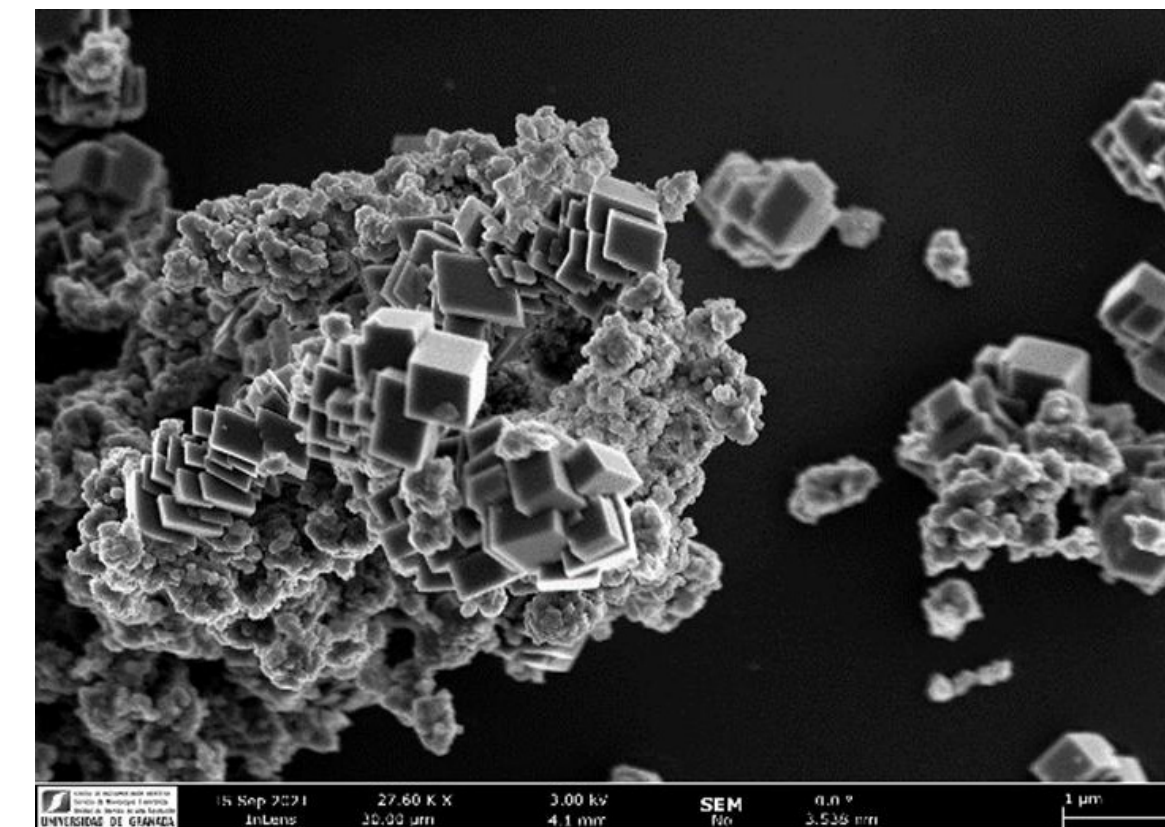
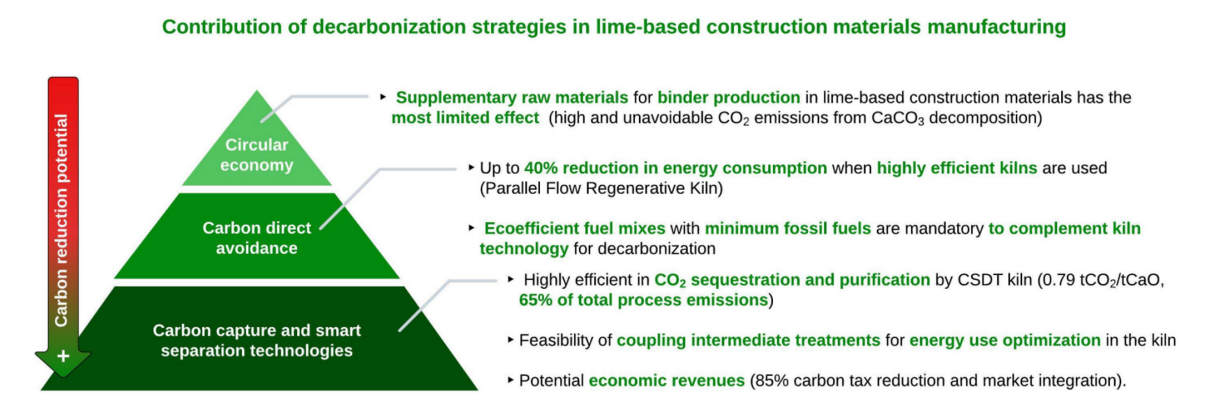
PI: Paulo B. Lourenço, Miguel Azenha, João M. Pereira

The SUBLime network, part of the European Training Network (ETN) under the Marie-Sklodowska-Curie actions of Horizon 2020, aimed at training researchers in sustainable innovations for lime mortars/plasters in construction and heritage conservation.

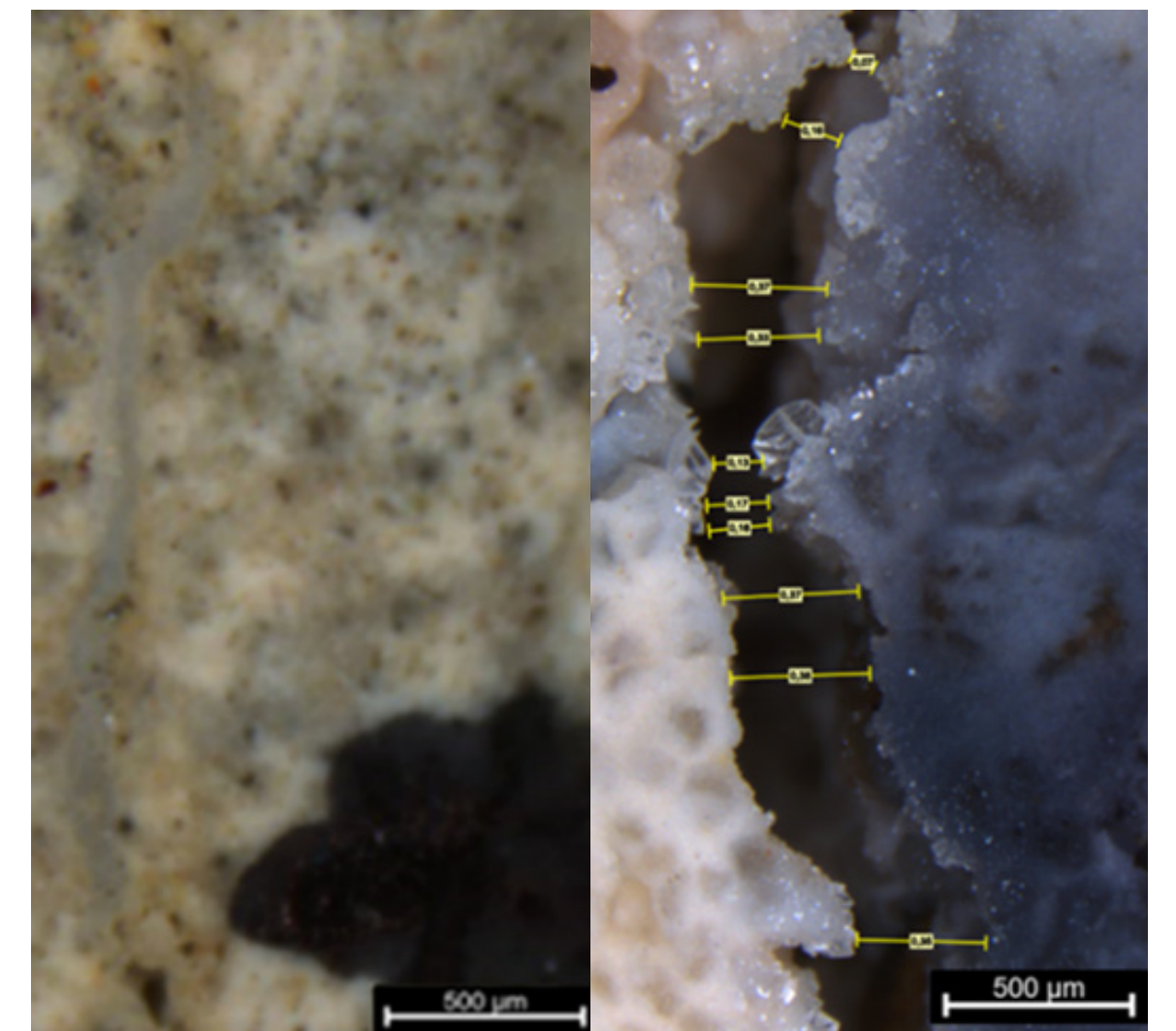
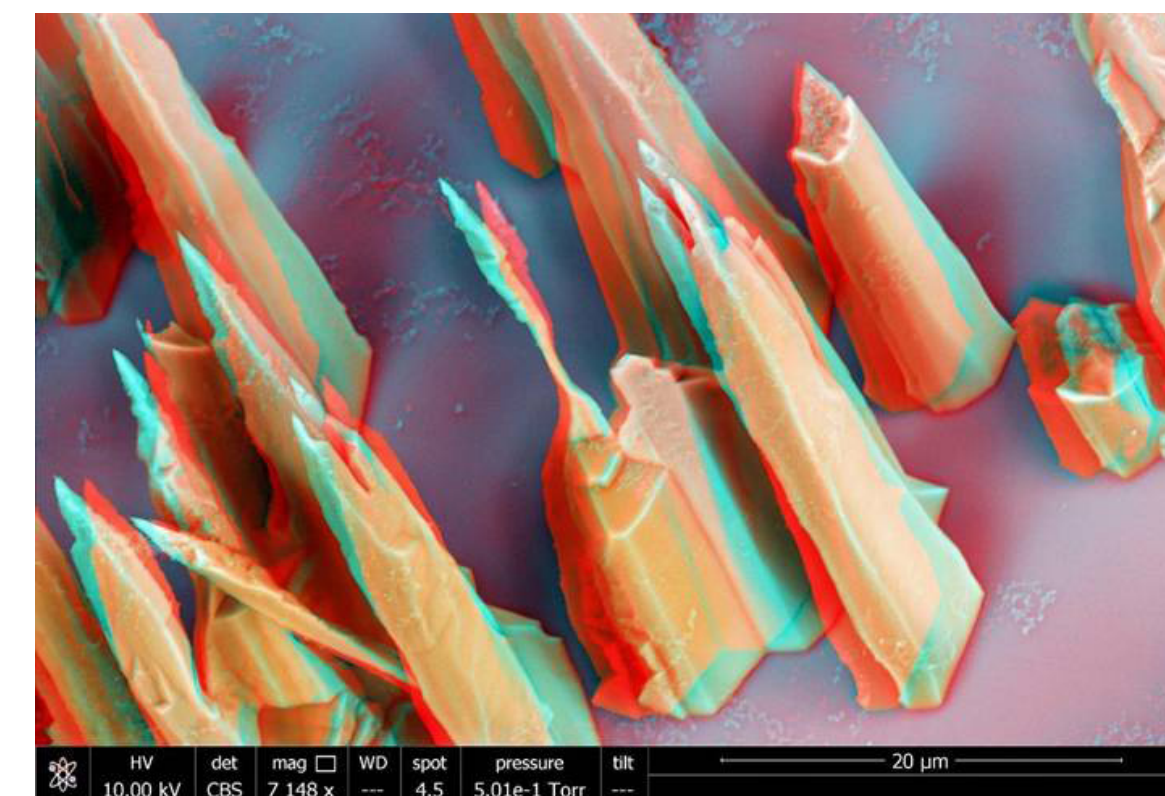


It focused on material characterization, numerical modelling of behaviour, and sustainability, within a performance-based design framework. Funded by the European Commission, coordinated by the University of Minho, and comprising 18 European partners including six universities and 12 industrial entities, the network fostered a multi-disciplinary approach to innovation in lime-based construction materials.

Innovative combinations of characterization techniques, such as nano- and micro-structural characterization, vision-based instrumentation and embedded sensors were implemented, further developed and applied to better understand the complex interplay of phenomena at several scales in lime-based masonry.



The unprecedented set of obtained information provided valuable data, which was leveraged new insights, theories and levels of application of new materials. The attained findings allowed new developments to be directed towards a new generation of sustainable/functional mortars/plasters, including relevant aspects such as self-healing, self-cleaning, protective (super) hydrophobicity, enhanced CO₂ capture capacity, and re-use of waste.





SC

FemWebAI

PI: Joaquim A. O. Barros

FemWebAI - Integrated approach for reliable and advanced analysis and design of sustainable construction systems in fibre reinforced concrete

The present project involved: 1) execution of a series of international blind simulation competitions (BSC) of experimental programs with representative FRC structures of real scale and using the most advanced monitoring technology (Fig. 1); 2) development of a Web-based information platform (WeBIP) including a database ecosystem (DBE) with machine learning (ML) and artificial intelligence (AI) techniques for collecting the results of BSC and reliable experimental results of the scientific community in a continuous and dynamic feeding (Fig. 2); 3) parametric studies and sensitivity analysis will be carried out for assessing the influence of the models parameters on their predictive performance (Fig. 3); 4) develop reliable methodologies for FEM-base design of FRC structures by modelling explicitly the fibres and the cracks and using an holistic vision of their structural behaviour and ML and IA techniques (Fig. 4).

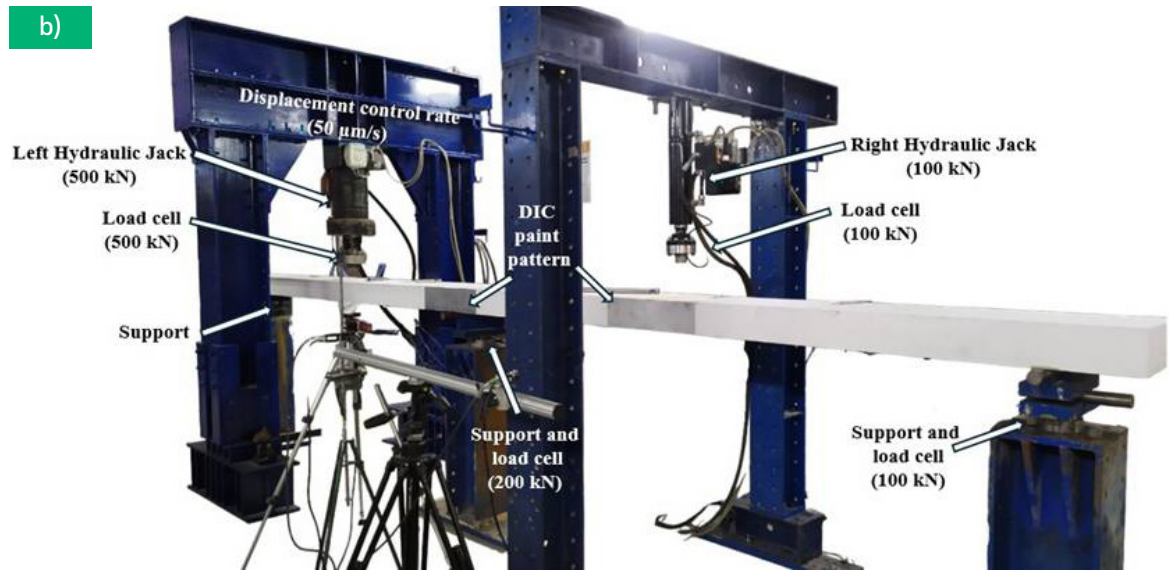


Fig. 1 – Blind simulation competitions executed: a) 1st – FRC T cross section beams failing in shear; b) 2nd – FRC shallow beams failing in bending; c) 4rd – FRC prototypes of slabs failing in punching.

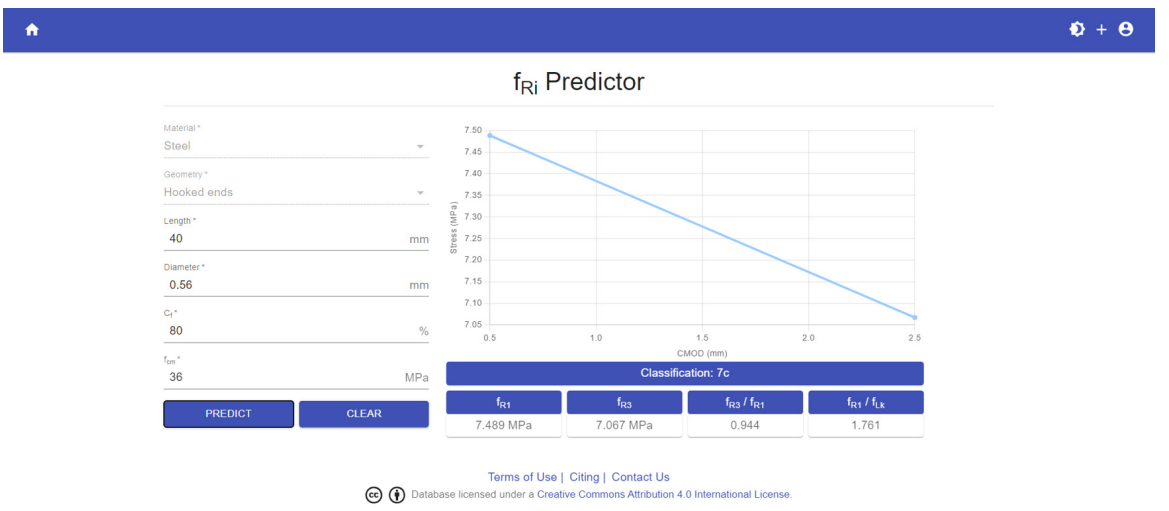
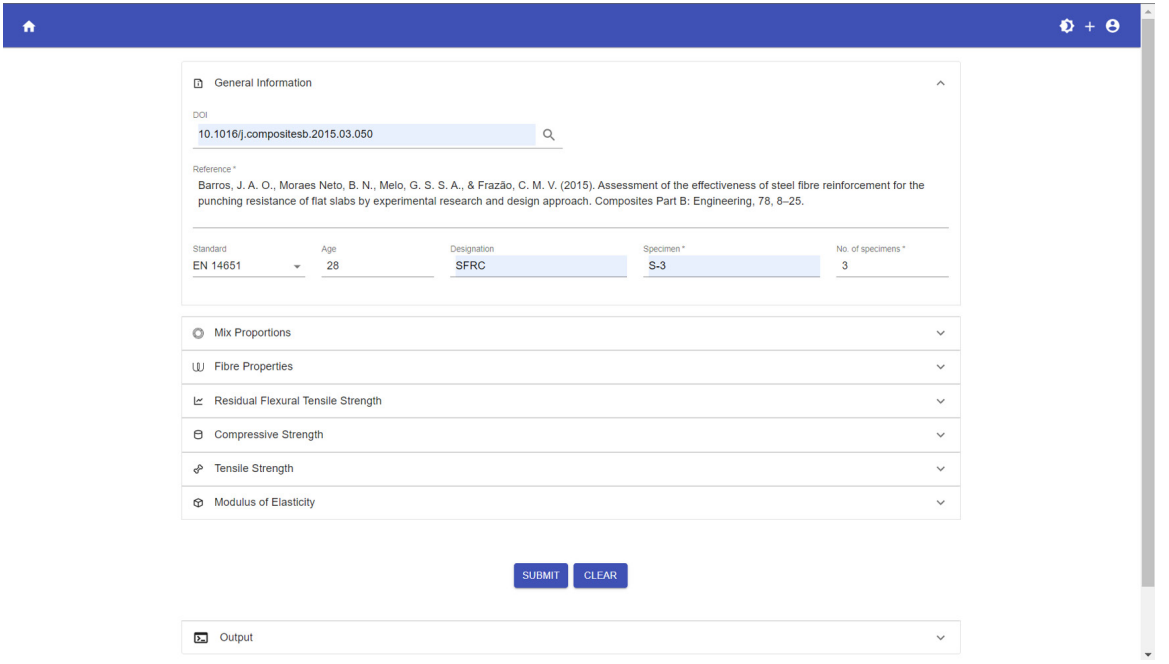


Fig. 2 – AlpFRC platform (aipfrc.org): a) User interface for entering test data into the database b) Application for predicting FRj.



Fig. 3 – Full-scale test used to assess the predictive capability of global resistance methods applied to FRC slabs supported on columns.

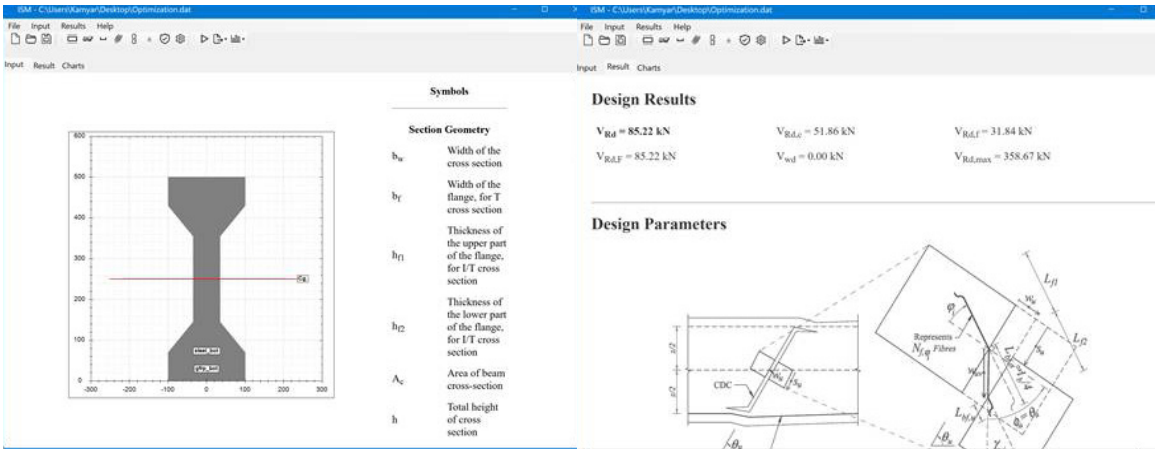
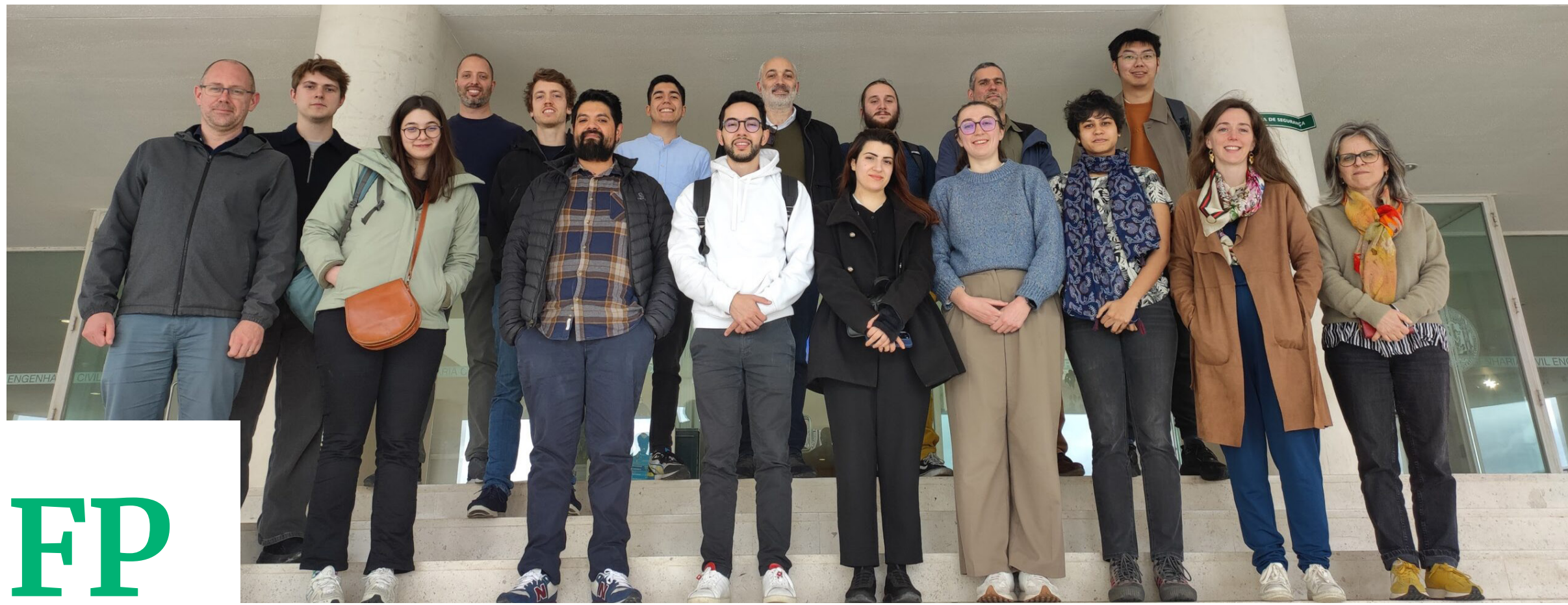


Fig. 4 – Modelling the contribution of steel fibres for the shear resistance of RC members with explicit representation of fibres.



FP

METAVISION

PI: Luís Godinho

METAVISION aims to set up a doctoral network to advance the field of innovative lightweight noise and vibration solutions and react to the challenges stemming from reconciling economic and ecological requirements with the need to deliver healthy and comfortable environments.

The METAVISION project, funded by the European Union under the MSCA Doctoral Networks, addresses a central challenge in modern acoustics and engineering: the need for lightweight, compact, and high performance solutions for noise and vibration control. As society becomes increasingly aware of the negative health impacts caused by excessive exposure to noise and vibration, traditional mitigation systems continue to rely on heavy or bulky materials, especially for low frequency performance. METAVISION seeks to overcome these limitations by developing innovative metamaterial-based concepts and transferring them from academic research to industrially viable applications.



METAVISION has two main objectives:

- **Training programme:** Establishing a Europe-wide training programme on innovative metamaterial concepts for noise and vibration reduction.
- **Research programme:** Launching an innovative research programme answering research questions related to innovative and future material concepts.

Now entering its last project year METAVISION is coordinated by KULeuven, integrates 11 Doctoral Candidates, and has 7 main partners: LAUM, UCoimbra, EMPA, Siemens, Phononic Vibes, Materialize and Metacoustic. It also involves relevant associated partners, such as Mota-Engil, Airbus, EMPA, SBB, Leuven Inc., CrowdHelix and Université du Mans. METAVISION is organized in 4 main WPs, including Design and Analysis, Manufacturing, Integration and development of Demonstrators, in which all partners collaborate.

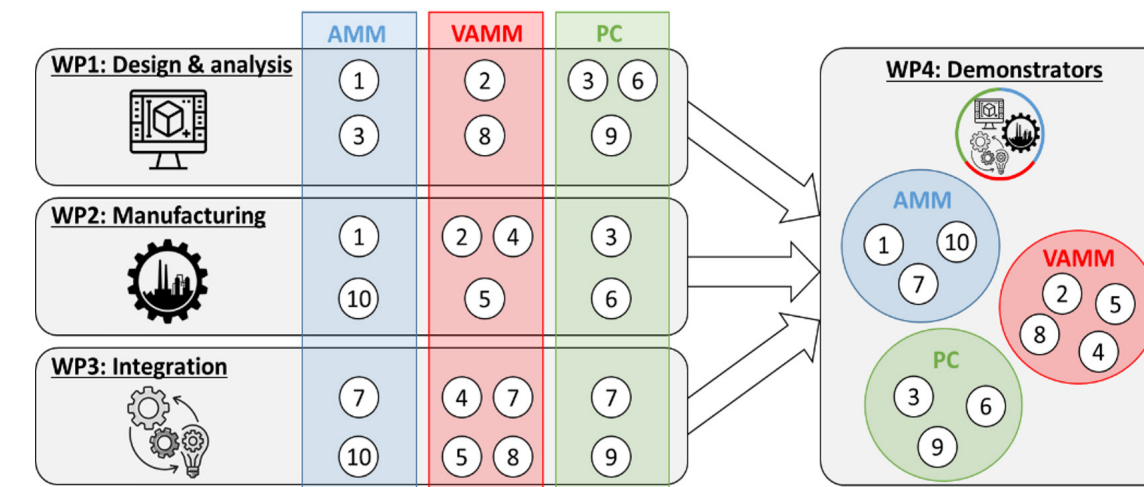
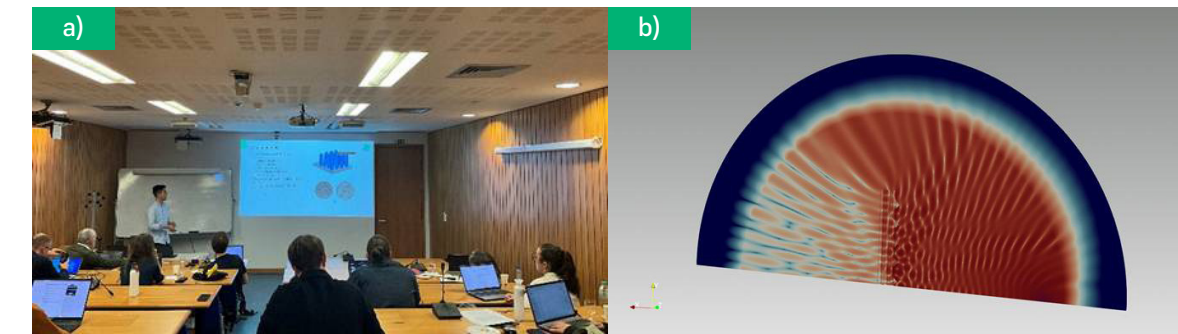


Fig. 1 – METAVISION structure.

The Functional Performance group at ISISE-UC, and specifically its cluster of Acoustics and Vibrations, plays a significant role in METAVISION's research and training activities, collaborating in the development of demonstrators, hosting 2 Doctoral Candidates, and co-supervising a 3rd DC hosted by Phononic Vibes:

- DC6, Nicolas Herrera-Leon – High performance phononic crystal barriers - performance and production aspects for a modular concrete-based solution (Hosted by UC)
- DC8, Marco Ribera Tejeda – Reducing sound insulation dips in building acoustics by means of acoustic metamaterials (Hosted by UC)
- DC9, Noman Ahsan – Phononic crystals for acoustic ventilated solutions (Hosted by Phononic Vibes)



a) Fig. 2 – METAVISION General Assembly and PhD Workshop at the University of Coimbra.

b) Fig. 3 – Numerical (FEM) simulation of the sound attenuation effect of a sonic crystal with front-mounted diffusers.

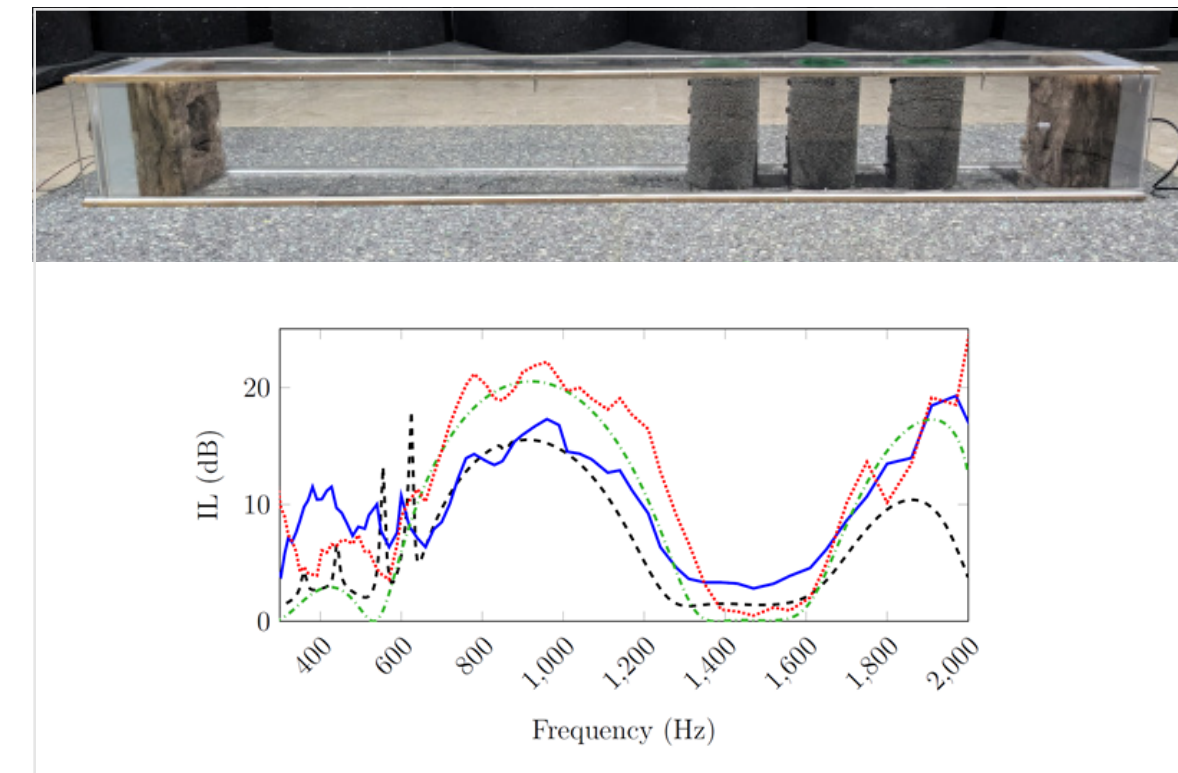


Fig. 4 – Hybrid sonic-crystal prototype.

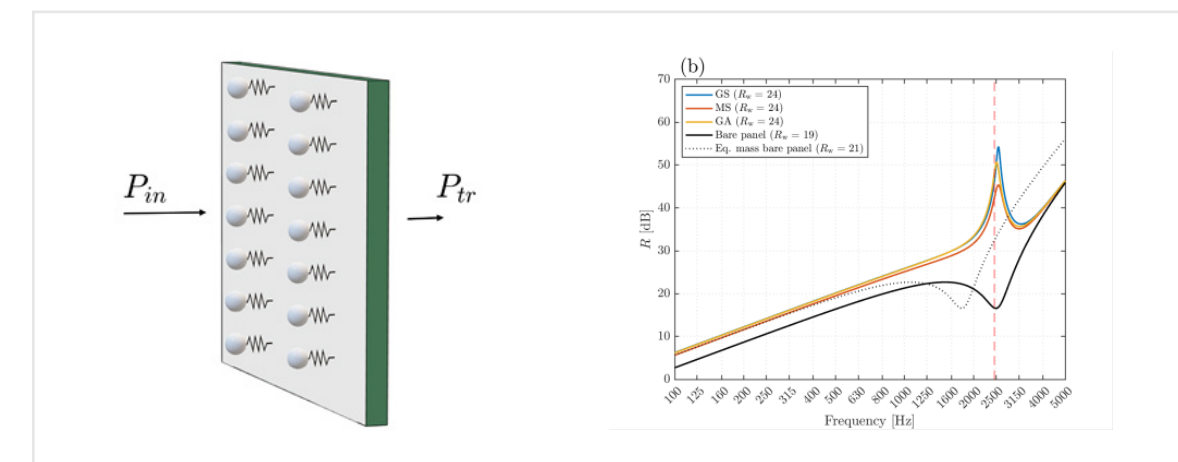


Fig. 5 – Conceptual resonator-based cancellation of coincidence effect.

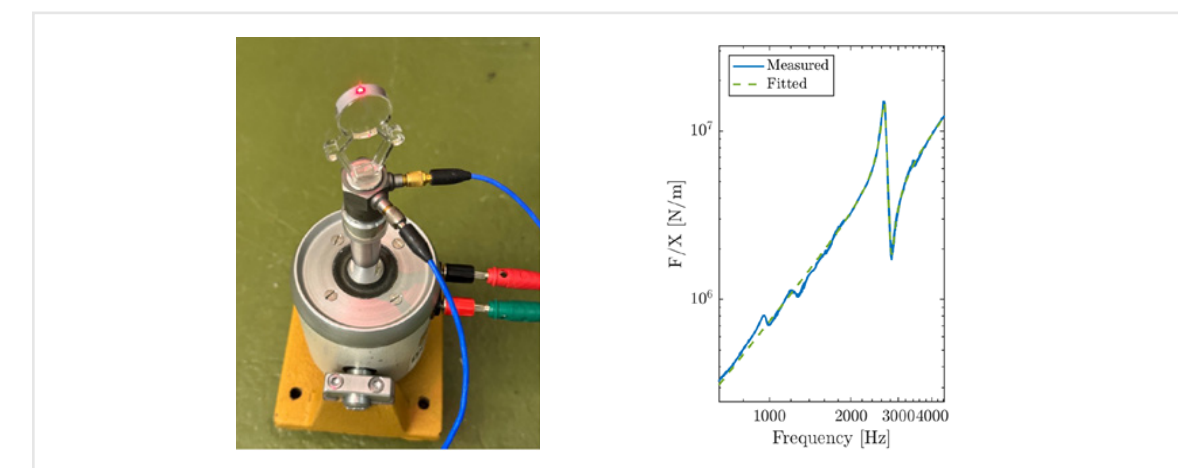


Fig. 6 – Experimental analysis of a conceptual inertia-amplification resonator.



SMCT

Cost Action CA20109 – Modenerlands – Modular Energy Islands for Sustainability and Resilience

Action Chair: Carlos Rebelo

2025 marked the closing of COST Action CA20109, MODENERLANDS, led by Professor Carlos Rebelo as Action Chair from ISISE-Coimbra. The initiative aimed to merge and systematise the efforts of European R&D groups working on Sustainable Energy technologies, with a particular focus on offshore wind and wave energy systems.



Its overarching mission was to coordinate scientific knowledge on floating modular energy islands, integrating research on renewable resources, structural solutions, network resilience, and sustainability. The Action was supported by COST, the European Cooperation in Science and Technology, a funding agency that strengthens research networks across Europe by enabling scientists to develop and expand their ideas collaboratively.

Running from 2021 to 2025, MODENERLANDS brought together more than 300 participants from 29 countries, establishing a highly interdisciplinary community spanning engineering, renewable energy systems, climate impacts, digitalisation, and socio-ecological perspectives. ISISE played an active role throughout the Action, with eight members contributing across activities, events, and leadership responsibilities: Carlos Rebelo, Helena Gervásio, Mariela Mendez-Morales, Luana Tesch, Jafar Tekantappeh, Melaku Seyoum Lemma, Dora Pontinha, and Kaike Monteiro.



Throughout its duration, the Action organised 12 medium- to large-scale face-to-face events, including five Working Group meetings, two Strategic Workshops, four Training Schools, and one International Conference. It further supported the community through four dissemination conference grants, eleven Short-Term Scientific Missions, and seven grants dedicated to Inclusiveness Target Countries and young researchers, reinforcing both capacity building and cross-border collaboration.

A defining milestone was the MODENERLANDS'25 Final Conference, hosted by ISISE in Figueira da Foz. This 3-day event welcomed 63 participants from 20 countries and featured keynote lectures, technical sessions, poster presentations, and technical visits to SEAPOWER and the Port of Viana do Castelo, highlighting Portugal's leadership in offshore renewable innovation. MODENERLANDS concludes with a strong and enduring network, with collaborations and new initiatives extending beyond its official end.



Institute for
Sustainability and
Innovation in Structural
Engineering

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Faculdade de Ciências e Tecnologia

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