



## Re-UNITA

# RESEARCH Newsletter

### Editorial

The legacy of Re-UNITA will live on past its end in October 2024. The project has been effectively motivating effective research collaborations between the several Universities of the first UNITA consortium, as also subliminally impacting on many other aspects concerning how research can be performed. Some of the project efforts and results will continue as subtasks of UNITA 2.0, while others have sparked projects, connections and friendships that fly with their own wings and whose true repercussions are impossible to predict.

I have participated more directly in WP4 - Creation of a network of shared research infrastructures, led by UNIZAR. This task included (i) the implementation of a database with said infrastructures (available in <https://reunitaresearchinfrastructure.i3a.es/>), (ii) the elaboration and signing of an agreement between the partners to ease the sharing of those resources and (iii), in the specification of a simplified procedure that researchers would need to follow while taking advantage of the agreement. The (apparently simple) task of identifying and cataloging the resources of each partner was very useful and interesting per se. All these results, specifically, will be improved upon and expanded in the context of Task 4.3 - "UNITA sharing of infrastructures and knowledge" of the second phase of UNITA.

The foundations of the UNITA Hubs, which are taking off in this time period, were also partially prepared in Re-UNITA. Feel welcome to join this trip!

Pedro R. M. Inácio  
Pro-Rector for the Digital University  
Universidade da Beira Interior (UBI), Portugal

### Cultural Heritage



The LIBEX research project<sup>1</sup> federates works on freedom of expression and discrimination. Bringing together researchers in several disciplines (law, linguistics, literature...) from France and Quebec, it focuses on the relationship between the sacred and the religious, based on the analysis of practical cases collected from diachronic and synchronic legal, media and literary corpora. The research was disseminated in the 10th international legal linguistics Summer School and a public conference. \*ANR-21-CE27-0016-21

<https://www.liseti.univ-smb.fr/web/liseti/712-ecole-d-ete-internationale-de-linguistique-legale.php>

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### Circular Economy



#### Bio-Based Oyster Shell Mortar

David Grégoire is co-heading the International hub Newpores dedicated to the mechanics and physics of porous materials, which intends to answer to new Energy and Environment challenges.

In 2024, he has been awarded of the Re-UNITA prize for open-access publications for its article "Granular Skeleton Optimisation and the Influence of the Cement Paste Content in Bio-Based Oyster Shell Mortar with 100% Aggregate Replacement", accessible [here](#).

Professor David Grégoire, Research Unit LFCR (UMR5150), Université de Pau et des Pays de l'Adour

### Renewable Energies



#### Project "Zero net energy residential green buildings"

Sustainable and green, energy-independent buildings are essential when it comes to tackling the current carbon dioxide footprint challenges. These challenges range from the lack of green areas in cities to the lack of energy-efficient solutions oriented for buildings, incorporating renewable energies.

The project "Zero net energy residential green buildings" aims to design a residential system featuring full energy independence (thermal and electrical), where advanced renewable energy sources and community gardens are hybridised in a synergy that promotes both energy efficiency and sustainability of urban environments.

This project is being developed by a team of CISE PhD students, composed of Hugo Antunes, João Dinis, Pedro Andrade and Pedro Barandier.

Link for the video: [https://youtu.be/\\_M\\_EBa-Kv0I](https://youtu.be/_M_EBa-Kv0I)

University of Beira Interior



### Maria Daphni Geronimou

Maria Daphni, a new doctoral student at IREGÉ, has been selected for the CHORAL program run by UNITA's Hub Cultural Heritage. Maria Daphni is co-tutored by USMB and UNIZAR. In response to the growing negative impact of mass tourism on heritage sites and visitor experiences, this research aims to explore the adoption of gamification tools to enhance the valorization and dissemination of cultural heritage while promoting sustainable tourism practices in European cultural destinations.

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### Nidal Del Valle Raydan, IPREM, Université de Pau et des Pays de l'Adour

Nidal Del Valle Raydan is assistant professor at Université de Pau et des Pays de l'adour. Her PhD focused on developing eco-friendly wood adhesives from keratin extracted from duck feathers. This research, supported by Eduardo Robles, expanded through collaboration with Gregory Chatel at USMB via the ReUNITA shared infrastructures program. Mrs Del Valle Raydan accessed USMB's sonochemical platform, advancing her work on ultrasound-assisted keratin extraction. This collaboration led to crucial publications and strengthened the ReUNITA hubs on Green Energy and Circular Economy.

Links:

Video: [https://www.youtube.com/watch?v=pldBY\\_I5FYo&ab\\_channel=UNITAUniversitasMontium](https://www.youtube.com/watch?v=pldBY_I5FYo&ab_channel=UNITAUniversitasMontium)

Publication: <https://www.sciencedirect.com/science/article/pii/S095965262402376X/pdf?md5=094884d671c332f7913fcc9e1d0cd1a8&pid=1-s2.0-S095965262402376X-main.pdf>



### Transmission electronic microscope

Transmission electronic microscope with 3 operating modes: high contrast, high resolution and low magnification. This microscope has coupled an electron dispersive energy spectrometry (EDX) detector that enables elemental analysis of chemical elements qualitatively and quantitatively from carbon. Possibility of obtaining electron diffraction patterns in crystalline structures. With application in biology, medicine, pharmaceutical and food industry, agriculture and in the characterization of nanomaterials.

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