MARIE SKŁODOWSKA-CURIE POSTDOCTORAL FELLOWSHIPS 2025

EXPRESSION OF INTEREST FOR HOSTING MARIE CURIE FELLOWS

HOST INSTITUTION

NOVA School of Science and Technology, NOVA University Lisbon (NOVA FCT)

RESEARCH GROUP AND URL

CERIS - Civil Engineering Research and Innovation for Sustainability (https://ceris.pt/) – NOVA Hub EcoBuilding Group

SUPERVISOR (NAME AND E-MAIL)

Paulina Faria – paulina.faria@fct.unl.pt or mpr@fct.unl.pt

SHORT CV OF THE SUPERVISOR

Civil Engineer, MSc in Construction, Post-graduation in Earth Construction Preservation, PhD in Civil Engineering – Buildings Rehabilitation. Associate Professor at NOVA FCT, member of CERIS (Civil Engineering Research and Innovation for Sustainability) research unit, senior member of ICOMOS, board member of ISCEAH for earthen construction conservation, member of RILEM Development Advisory Committee, collaborating on Technical Committees for the characterization of eco-efficient building products, and member of PROTERRA Ibero-American network. She was Editor in Chief of Elsevier´s Journal of Building Engineering and is board member and reviewer of several other scientific journals. Her main research areas are related to building materials, products and technologies with low embodied energy (including clayish earth, lime, gypsum, pozzolans, biomass), and contribution for occupants' health and comfort. She has more than three hundred publications, supervised more than two hundred students (post-doc, PhD and MSc thesis), coordinated and collaborated on several projects, having an h-index of 33 (Scopus). https://novaresearch.unl.pt/en/persons/p-faria

5 SELECTED PUBLICATIONS

- ROCHA, D.; FARIA, P.; LUCAS, S. (2025), Clay-gypsum mortars: The influence of binder and sand ratios. Results in Engineering 26, 104702. https://doi.org/10.1016/j.rineng.2025.104702
- SANTOS, T.; LUIJTEN, N.W.; SANTOS SILVA, A.; SILVESTRE, J.; FARIA, P. (2024), Earthen plasters hygrothermal and mechanical performance: Effect of adding recycled gypsum from plasterboards and raw hemihydrate. Journal of Building Engineering 98, 111407. https://doi.org/10.1016/j.jobe.2024.111407
- SÁNCHEZ-CALVILLO, A.; RINCÓN, L.; HAMARD, E.; FARIA, P. (2024), Bibliometric analysis on earthen building: approaches from the scientific literature and future trends. Buildings 14, 3870. https://doi.org/10.3390/buildings14123870
- PACHAMAMA, R.N.; FARIA, P.; REZENDE, M.A.P.; MORAES, P.M. (2024), Cow dung biostabilized earth mortars: reusability and influence of processing, humid curing and cow diet. Buildings 14(11), 3414. https://doi.org/10.3390/buildings14113414
- FARIA, P.; LIMA, J. (2018), Earthen plasters (in Portuguese). Cadernos de Construção com Terra 3, 1ª Ed., Argumentum, Lisbon, 128 p. ISBN: 978-989-8885-04-3. https://run.unl.pt/handle/10362/112235?locale=en

PROJECT TITLE AND SHORT DESCRIPTION

Optimized earthen plasters for eco-building

Earthen plasters are made with mortars produced with a non-industrially processed material, that is earth, extracted from soil. Many studies have been developed in the last years trying to optimize the formulation of earth plasters, namely in terms of: the influence of some clays present in the earth, the minimum additional sand needed in the formulation to control shrinkage, the possibility of using residues instead of the additional sand, the capacity to act as moisture buffers and to capture indoor pollutants, the effect of some natural and bio stabilizers (other additions) to provide additional characteristics, the reusability of the plasters, the contribution earth plasters can provide in case of fire, the behavior when used in several types of substrates, the life cycle analysis in comparison to other plasters. Therefore, the earth plasters proved to be ecological in comparison to common plasters and technically efficient in terms of performance requirements when used coating indoor walls. Particularly, they can provide a passive contribution to indoor environmental quality in buildings, contributing to users' comfort and health and, complementary, to buildings energy efficiency. However, large volumes of earth are excavated in urban working sites (foundations, underground floors, metro lines, etc.) and classified as inert waste, transported to waste management companies and not used as a resource to produce earth plasters. This pos-doc project intends to find ways to: declassify this resource as waste, facilitating their use; define easy methodologies to characterize and to classify excavation earth that is adequate to produce earth plastering mortars, by small companies that have to crush, sieve and formulate pre-dosed earth plasters; with the help of artificial intelligence (IA) define a data base with the formulations and characteristics of existing and tested earth plasters, with all the types of earth that have been used, additional sand, recycled aggregates and stabilizers, trying to define the main parameters of the earth influencing the formulation, to achieve optimized plasters; to promote the interest of users, building companies, building products suppliers and other stakeholders by this type of plasters. The aim is to better support the use of a resource that is now a waste, to produce a very useful building product (plasters) with very low embodied energy and cost, and with a significative contribution to people's wellbeing.

SCIENTIFIC AREA WHERE THE PROJECT FITS BEST*

Information Science and Engineering (ENG), Environment and Geosciences (ENV) and Social Sciences and Humanities (SOC)