



# SUBLime

Sustainable Building Lime  
Applications via Circular Economy  
and Biomimetic Approaches



## OPEN PhD POSITION in European Training Network

**We are looking for a dedicated and highly motivated Early Stage Researcher (ESR), who will join our team to craft the future of lime mortars/plasters in new construction and conservation of the built heritage.**

### SUBLime description (4 years ETN project starting February 2021)

Lime is one of the earliest industrial commodities known to man and it continues to be one of the essential building blocks of modern Society. The global lime market is anticipated to approach the value of 44 Billion Euros by the end of 2026 and resulting in various growth opportunities for key players. The SUBLime network aims to develop the most advanced technology in lime-based materials modelling and characterization for industrial use that will go beyond the limitations of existing solutions in new construction and conservation in the built heritage. It is dedicated to recruit and train fifteen PhD students in multiple scientific and engineering fields towards a better understanding and development of sustainable innovations in both added functionalities and sustainability aspects in lime mortars and plasters, strongly based on novel biomimetic and closed loop recycling approaches. The cross-disciplinary approach throughout the SUBLime value chain, leveraging the knowledge of the academic (6) and industrial members (11), such as lime producers, mortar/plaster/block producers, and end-users for the prioritization of industrial needs, will dramatically increase the transfer of scientific knowledge to the lime-consuming industries in the EU.

### ESR8 – UMINHO

#### Industry oriented experimental techniques for lime based materials and structures

**Objectives:** This plan has two fundamental objectives: (a) to innovatively apply and adapt experimental techniques to lime-based mortars and structures in ways that make them feasible for in-situ application, and not just on research; (b) to deploy the original techniques developed, together with standard technologies, in order to execute systematic verification of the feasibility of mortar mixes studied within the consortium in view of the validation of the tables of Eurocode 6 for masonry mortars. This will allow a directly applicable and validated framework to be deployed in industrial context, with significant added value for future constructions in terms of quality control and performance requirements satisfaction assurance. Specific efforts will be done to allow information to be attained in-situ from expedite medium-to-low-cost systems that allow generalization in actual construction practices. Three main lines will be pursued in such concern: 1) advanced used of knowledge on UPV measurement; 2) retailoring the EMM-ARM (Elasticity Modulus Measurement through Ambient Response Method) for application in lime mortars to study the very early stiffness kinetics; 3) Deploy cyberphysical systems based on development boards.

**Expected Results:** The expectable results comprise: (a) custom devised approach for UltraSound Pulse Velocity measurement in-situ with direct relation with actual relevant properties according to Eurocode6; (b) EMM-ARM ready for deployment in-situ; (c) availability of custom cyberphysical systems targeted to properties such as cohesion and bond, among others; (d) validation of the interplay of properties of the tables of Eurocode 6 and evaluation of mortars within the consortium in such context.

**Keywords:** cyberphysical systems, lime, mortar, masonry, nondestructive testing.

**Applicant Profile:** Master level in Civil Engineering or related field, ideally with background in experimental research. Excellent communication skills (both written and oral) in English.

**PhD main locations:** The recruited ESR is given the opportunity to conduct 3 years of PhD studies at [ISISE](#) (Institute for Sustainability and Innovation in Structural Engineering) from the [University of Minho](#) but also to visit other network partners for secondments ([Sievert](#), [Silesian University of Technology](#), [European Mortar Industry Organisation](#)), and to attend the training events of the network.

#### Main contacts:

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More details about SUBLime project, requirements for the candidates and recruitment procedure: [www.sublime-etn.eu/jobs/](http://www.sublime-etn.eu/jobs/)