

## Biochar talks – Promoted by Mauro Giorcelli, DISAT

Wednesday June 18, 11.00 am “Sala Didattica” DISAT 1<sup>st</sup> floor

### Ceramic Materials: From Tradition to Carbon Sinks through Circular Innovation

While innovation in structural ceramics is often constrained by industrial and economic limitations, new possibilities emerge when the principles of the circular economy are applied. Starting from conventional clay-based products, the presentation examines how the integration of various waste materials into clay matrices—validated through pilot-scale trials—has enabled the development of more sustainable ceramic products without compromising essential properties. Emphasis is placed on the challenges of introducing change into mature ceramic processes while maintaining technical and economic viability. Besides, the most recent phase of this work focuses on the valorization of biomass residues through pyrolysis/gasification, producing biochar with the potential to act both as a functional additive and a long-term carbon sink within fired ceramics. This transition from inert waste fillers to active carbon materials highlights new opportunities for innovation at the interface between materials science, sustainability, and industrial application, committed to the contemporary environmental goals. The seminar offers a comprehensive, application-oriented perspective that invites further exploration and cross-disciplinary collaboration.



### Prof. Salvador Bueno, Universidad de Jaén, Spain

Dr. Salvador Bueno is an Associate Professor at the University of Jaén (Spain), specialised in sustainable construction ceramics within the circular economy framework. With over 20 years of experience in R&D of ceramic materials, his work focuses on integrating industrial waste and biomass-derived biochar into ceramics to reduce their environmental impact. He has conducted research at leading institutions, including ICV-CSIC (Spain) and ISTECCNR (Italy), and spent 12 years at the Technological Centre Innovarcilla, where he led innovation projects in close collaboration with the ceramic industry. His expertise includes ceramic formulation, mechanical testing and thermal performance. He has published approximately 40 articles in peer-reviewed journals, including the Journal of Cleaner Production and Construction and Building Materials, and has served as the Principal Investigator in six regional R&D projects. His research combines scientific and practical applications on low-carbon solutions for the construction sector.



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