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Computational Mechanics & Advanced Materials Group - DICAr

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SEMINAR

Hierarchical cellular solids: bringing circularity to advanced engineering materials

Nature's solution for lightweight yet strong and multifunctional materials are cellular solids, as in bone, wood and cork. These biological materials achieve an optimal balance of strength, toughness, and low density through complex, hierarchical architectures composed of multiple phases.
Similarly, many modern engineering applications—from transportation to architecture and energy systems—require structural materials that are both lightweight and mechanically robust. One promising approach to meet these demands lies in the use of triply periodic minimal surfaces (TPMS), geometries that appear in both biological systems and mathematical constructs.
This talk investigates recent advances in TPMS-based lattices, with a focus on their mechanical behaviour under compression and impact, as well as their acoustic properties. The talk will also explore the creation of hierarchical porous architectures by combining physical foaming and additive manufacturing. This approach enables multi-scale porosity, and the effects of this porosity on energy absorption and failure mechanisms are being studied across different lattice topologies.

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27/06/2025, 11:00
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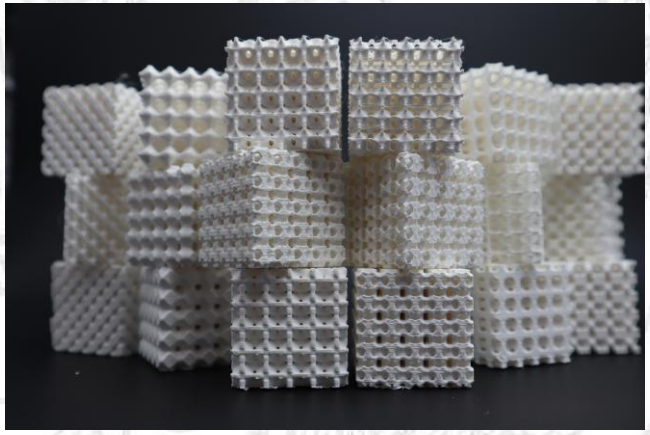

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