

## **Mechanics and tailoring of additively built metallic lattices and application to orthopaedics**

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Lattice materials can be engineered to elicit mechanical and functional properties often beyond those of conventional materials. In this talk, I will focus on metallic lattices additively built, and address three questions pertaining to their mechanics, bone ingrowth, and properties tailoring for bone replacement implants.

- How to capture the mechanics of metallic lattices with dispersed defects induced by Selective Laser Melting?
- How to assess the interplay between their mechanics, bone ingrowth and manufacturing constraints?
- How to engage their optimized properties in bone replacement implants of improved functionality?

The approach that I will follow draws from concepts of multiscale mechanics, structural optimization, and additive manufacturing, and a combination of theory, computational mechanics and experimental testing is called to serve for material testing and performance validation.