

# **Additive Manufacturing: some dreams, some nightmares**

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## **Abstract**

Laser-based Powder Bed Fusion of Metals (PBF-LB/M) is an additive manufacturing technology suitable for producing metal components with complex geometries and remarkable mechanical properties and performances. However, a widespread adoption of this technology in many industrial context is yet hindered due to the high stochasticity of the process. In fact, the complex process-structure-property relationships occurring in PBF-LB/M are today not yet fully understood. Therefore, suitable physical and numerical models need to be developed to shed light on these complex phenomena to boost a broader adoption of AM technologies in industrial applications.

It is well known for example that the elastic behavior of lattice structures is dramatically underestimated when computed on the as-designed geometry. Furthermore, due to the inherent variability of PBF-LB/M process parameters, several sources of uncertainty hinder a full understanding of the complex process-structure-property relationships.

In the presentation we will highlights some of the interesting applications open by the power of AM but also some limitations due the problems highlighted above.