ESAFORM Webinar Series 2026

Laser metal additive manufacturing: thermomechanical modelling and numerical simulation at meso and macro scales

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Registration link, to receive the information for the connection:
https://cnrs.zoom.us/meeting/register/Ew7w9yIvSo6_z1vQ64jjIA

Abstract

In this webinar, we will begin by briefly introducing the main laser additive manufacturing processes for metallic alloys. We will then explore the modelling of key physical phenomena governing laser–metal interactions. This will inform our discussion on how numerical simulations can be structured at the mesoscale—covering individual tracks, side-by-side and/or superimposed layers.

The final part of the webinar will focus on thermomechanical simulations at the macroscale of entire parts. Throughout, we will present and discuss practical application examples at both scales, supported by comparisons with experimental observations and measurements. Special attention will be given to the advantages of using crystal viscoplastic behaviour laws to model anisotropy at both scales.

Biography

Michel Bellet is Professor at Ecole des Mines de Paris, one of the major Engineering schools in France, today within PSL University. He is based in Sophia Antipolis, near Nice, working in CEMEF, a research center dedicated to material forming. His research focuses on the thermomechanical modeling and numerical simulation of industrial processes involving solidification, including casting, welding, and – more recently – additive manufacturing.

He has been actively involved in teaching, both at the undergraduate level (serving as co-director of the Materials Specialty program at Mines Paris for over 15 years) and for PhD students. He is currently the head of the Department of Mechanics and Materials in Mines Paris.
To date, he has supervised 49 PhD students and co-authored 81 articles in international journals. In the field of additive manufacturing alone, he has supervised 10 PhD theses and co-authored 22 papers over the past decade.