Announcement of a series of seminars

Microstructure-based high-resolution modelling of structural materials: application to architected metal alloys and to carbon-fibre reinforced composites

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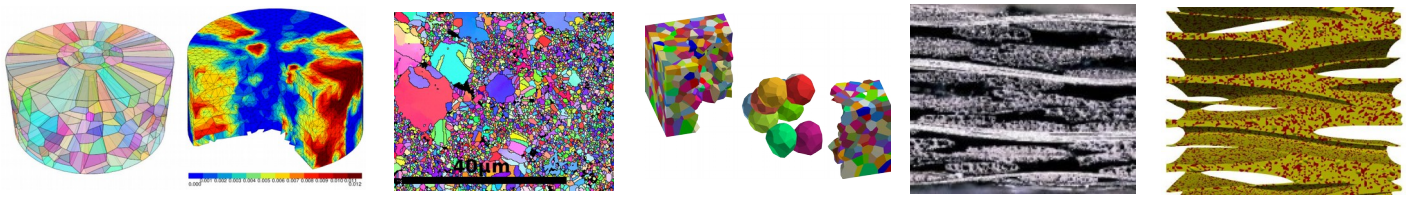
Program

- Introduction to heterogeneous materials and to (process)-microstructure-properties relationships (1 hr.)
- Fundamentals of multiscale modelling of heterogeneous materials: scales, bounds of properties, introduction to homogenization (1 hr.)
- Full field modelling of metal alloy: digital twin, microstructure description, crystalline plasticity (2 hr.)
- Application to architected alloys: multimodal grain size distribution processed by powder metallurgy and additively manufactured lattice structures (2 hr.)
- Application to the thermo-mechanics of carbon fiber reinforced composites under severe thermal conditions (fire exposure) (2 hr.)

The proposed applications are based on different kinds of experimental analyses: process, microstructural analyses and mechanical tests for the alloys, thermal analyses and thermomechanical tests for the composite.



Short biography

Fabrice Barbe has obtained his Master thesis at Paris Sorbonne University and his PhD at Mines PSL in 2000. His activities deal for its largest part with microstructure-based numerical modeling of materials, especially polycrystalline materials, and more recently carbon-reinforced composites. He is an Associate Professor of the French engineering school INSA Rouen Normandie, affected to the laboratory Groupe de Physique des Matériaux, has coordinated several scientific projects for a total grant of 1.1ME, he has published 35 journal articles and 7 book chapters.