



Séminaire PIMM

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Salle Structures
Arts et Métiers ParisTech, 151 bd de l'hôpital, 75013 Paris

13 H 30

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MODELLING OF MICROSTRUCTURE EVOLUTION IN METALLIC MATERIALS

Macroscopic properties of metallic materials such as strength and ductility are defined by the morphology and composition of the microstructure. But the state of the microstructure continuously evolves, especially if the thermal conditions change and/or in the presence of plastic deformation. This suggests that some control can be exerted over the state of the microstructure by proper control of relevant parameters during thermo-mechanical materials processing. This, in turn, allows tailoring of macroscopic material properties. Through additional knowledge of how the microstructure evolves, an increased understanding can be gained of the overall behavior of these types of materials.

While computational modeling of materials processing and of the behavior of structures and components is commonly conducted at the macroscopic, "engineering", scale the present talk will mainly focus on numerical approaches that allow modeling of microstructure evolution at the micrometer scale. Emphasizing metallic materials, this means that crystal structures, grains, grain boundaries and dislocations will be considered along with processes such as recrystallization and grain growth.