

Title:

Size effects in plasticity and fracture

Organizers:

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Abstract:

In recent years, there has been an increasing interest in characterising the behaviour of metallic materials across scales, with the ultimate goal of quantitatively predicting deformation and fracture. Optimising the mechanical response of materials requires modelling and understanding phenomena stretching over multiple scales, from the atomistic level to the mesoscopic level of damage evolution. Dislocation plasticity, enriched continuum models or molecular dynamics are maturing these years, providing mechanistic insight in a number of applications, from micro-void cracking to hydrogen embrittlement. Concurrently, advances in microscopy techniques are unravelling details of the mechanisms at play in plastic flow localization and damage evolution, alongside with the microstructural features that develop.

The aim of this session is to bring together experimentalists, theoreticians and computational scientists to discuss new insights on understanding and modelling plastic deformation and fracture.