MM 10: Invited Talk: Lola Lilensten

Time: Tuesday 9:30–10:00 Location: SCH/A251

Invited Talk MM 10.1 Tue 9:30 SCH/A251

Chemically graded materials for accelerated exploration of the TRIP-TWIP Ti-alloy family — •Lola Lilensten — IRCP - CNRS, Paris, France

Twinning induced plasticity (TWIP) and transformation induced plasticity (TRIP) in β-metastable titanium alloys provide remarkable work hardening, enhancing ductility and strength, opening up new possibilities for titanium alloys. These mechanisms depend on the metastability of the retained β phase and thus on the alloy composition.

However, the development of these alloys is still limited. Current design approaches are mostly empirical, relying on datasets that focus on composition and deformation mechanisms, neglecting factors like processing conditions, grain size, and oxygen content. This leads to inconsistencies and overlooks optimization opportunities through microstructure engineering.

The chemically graded materials approach is proposed to tackle this problem, enabling quick identification of compositional ranges where specific deformation mechanisms occur, and consistent results since all compositions share the same processing. This method accelerates the study and development of TRIP/TWIP Ti-alloys.