Imperial College London

Speaker 3

# *A closer look at the TWIP+TRIP mechanism in medium Mn steels*

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*ABSTRACT:*
Medium Mn (medMn) steels have gained significant academic and industrial attention due to their low cost, high strain hardening rates (>1.5 GPa) and large elongations to failure (>40%). This is achieved by adjusting the stacking fault energy and stability of the austenite phase, thereby activating a combined Twinning Induced Plasticity and Transformation Induced Plasticity (TWIP+TRIP) effect. While the TWIP+TRIP effect has been studied extensively in stainless steels, little is known about how to control it in medium Mn steels. This presentation aims to shed some light on the TWIP+TRIP effect in medMn steels, especially on how microstructure affects the twinning and transformation responses.

Two medMn steels with an equiaxed and lamellar microstructure were produced using the same composition. Interrupted tensile specimens were characterised using Electron Backscatter Diffraction (EBSD) and Transmission Electron Microscopy (TEM) to examine the evolution of deformation structures with strain.