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**CDT-ACM PhD Project 2019**

**Project Title: Deformation micromechanisms around notches in titanium alloys**

**Project Supervisors:**

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**Short description**

Titanium alloys with particular microtextures show elevated sensitivity to crack initiation around notches under high mean stresses, which is of concern in jet engine fan components. We believe that this sensitivity to hydrostatic stress is related to the inability to relax the dislocation structures produced at the boundaries between incompatible `macrozones’ of similarly oriented grains and to the propensity such alloys have to planar slip, which is a consequence of their high Al and O content. In this project we will examine the deformation around notches using in situ DIC in the SEM, to examine the strain localisation between macrozones, and then TEM to image the underlying the dislocation structures. Correlative atom probe tomography will then enable us to examine the relation of these to the underlying phase composition and the effect of Al and O, with the aim of producing alternative products that do not suffer this notch fatigue deficit, which will be of great benefit to industry.