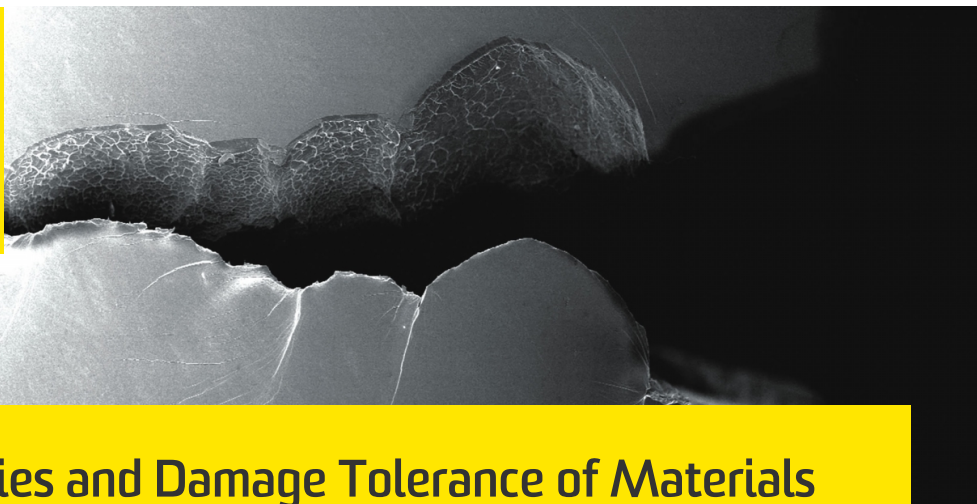




UNSW
SYDNEY



Mechanical Properties and Damage Tolerance of Materials

Delivering a better understanding of materials through characterisation, testing, failure analysis and lifetime prediction across a range of harsh and challenging environments. Thereby contributing to the development of new and novel materials such as high entropy alloys, bulk metallic glasses and bioinspired composites.

Competitive advantage

Material performance in extreme environments

- Nano- and Micro-scale testing up to 600°C
- Macro-scale testing from cryogenic to 1500°C
- Corrosive and oxidizing environments, vacuum, inert gas, aqueous & biological conditions

Modelling and simulation:

- Novel crack propagation model development (overloads, spectrum loading, creep-fatigue)
- Discrete damage model development

Conventional alloys and novel materials (high-entropy alloys, ceramics, metallic glasses, intermetallics, bio-inspired materials, etc.)

Impact

- Novel materials development for challenging environments
- Improved lifetime predictions

Capabilities and facilities

- Alemnis in situ nanoindenter with intrinsic displacement control
- Deben micro-test for ex situ and in situ deformation and property measurements
- Instron multi-axial testing frames
- Crack propagation modelling with overloads, spectrum loading
- Discrete modelling of deformation, damage, failure

Our partners

- US Department of Energy – Superalloys
- Hereaus Group – Additive Manufactured Metals
- Intel Corporation – Solders
- SPEE3D – Additive Manufactured Metals
- PCC Structurals – Superalloy Castings

More Information

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- ESCO Corporation – Steel Welds
- Plansee SE Corporation – Refractory Metals
- Glassimetal Inc. – Metallic Glasses
- Liquidmetal Technologies– Metallic Glasses
- PLATIT AG – PVD Coatings