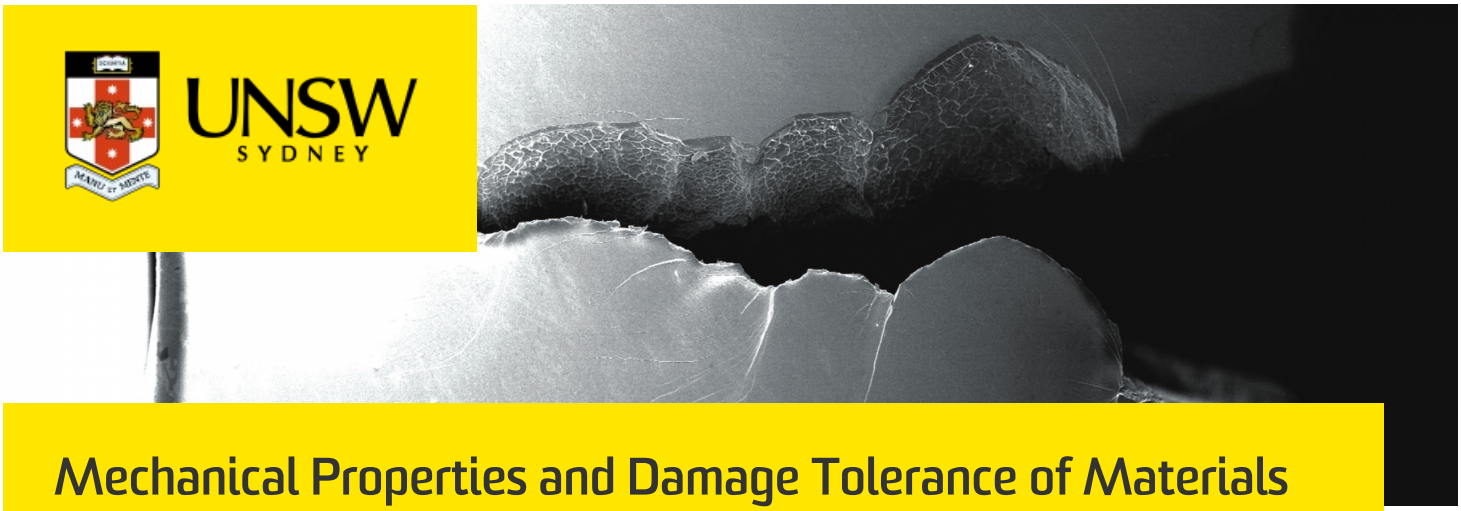

Mechanical Properties and Damage Tolerance of Materials

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.

More Information

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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

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