



**UNSW**  
SYDNEY



## Microstructural Engineering of Next Generation Aerospace Alloys

**The demand for alloys that can withstand high mechanical loads under harsh, high-temperature environments for aerospace and defence is growing. Combining state-of-the-art experimental techniques, mechanical testing and multi-scale modelling produces materials with superior properties**

### Competitive advantage

- High yield strength alloys for high temperature, load applications
- > 10 % improvement in turbine yield strength at 650oC
- Unique combination of experimental and theoretical tools
- Strong connections to international manufacturers

### Impact

- Superior mechanical properties; high-temperature strength, creep resistance
- Reduced structural weight
- Improved fuel efficiency
- Increased safety
- More economical processing through targeted process re-design

### Successful applications

- Microstructural engineering of turbine discs for next-generation aircraft engines
- Thermo-mechanical processing of defect-free specialty alloys
- Strong track record of applied research as evidenced by publications with industrial partners

### Capabilities and facilities

- Materials processing labs; synthesis, thermal/thermo-mechanical testing and simulation
- Advanced electron microscopy and nano-scale characterisation of interfaces and small precipitates
- Mechanical & morphological testing
- Thermo-kinetic modelling

### Our partners

- International and local specialty alloy manufacturers
- Voestalpine Group

### More Information

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