



UNSW
SYDNEY



Next-Generation Additive Manufacturing (3D Printing)

Enabling the creation of innovative products for a diverse range of industries through the development of new materials that enable additive manufacturing (3D Printing) at low cost.

Competitive advantage

- Expertise in additive manufacturing of advanced materials, including Al, Ti, steels, Cu, CoCr, Ta, NiTi, metallic glasses, and high entropy alloys and metal matrix composites, including a machine-learning based design process that enables timely development of new metallic materials
- Finite element modelling, to deliver robust performance, multi-functionality and low-cost solutions
- Novel structures—functionally gradient, porous or solid—with tailorable stress state and microstructure for unparalleled properties
- Low-cost and effective post-treatment strategies for additive manufactured metal components
- The additive manufacturing process of newly-designed materials can be optimised to minimise defects, allowing the creation of innovative products for a diverse range of industries

Impact

- Advanced structures with excellent and predictable dynamic mechanical performance (e.g. fatigue) through additive manufacturing
- New products and lower-cost manufacturing

Successful applications

- Additive manufacturing of high strength and high ductility metal matrix composites and structures for aerospace and automotive applications
- Additive manufacturing of antimicrobial and antibacterial stainless steel and Ti porous structures for biomedical applications

Capabilities and facilities

- Metal 3D Printers: Concept Laser Mlab cusing 200 R and ProX DMP 300
- Mechanical properties testing facilities, including in situ testing, controlled temperatures and environments, micro-mechanical testing, fatigue and wear testing
- High resolution microscopy and tomography, including Scanning electron microscope, Transmission electron microscope, Electron backscatter diffraction and Micro X-ray computed tomography

More Information

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