Designing next generation aerospace materials for cleaner air travel

Engineering the next generation of aerospace materials for cleaner and safer air travel. Reducing world-wide aviation emissions of currently 2% and sustainable use of resources are key drivers for pollution control and mitigation. New manufacturing processes and alloys are a vital response to the demand for more efficient and resource conserving jet propulsion.

More Information

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Competitive advantage

- Saving fuel - stronger materials unlock new designs of light-weight aircraft engines
- Increase efficiency - new aerospace materials improve better high-temperature durability
- Economising the use of resources - additive manufacturing saves time and conserves raw materials

Impact

- Additive 3D metal printing disrupts conventional manufacturing processes to grow novel processing routes and boost efficiency
- International and Australian industrial collaborations streamline the transfer of laboratory-scale technologies into real-world applications

Successful outcomes

- Mapping the processing-structure-performance relationships of new aerospace materials
- Optimised manufacturing routes to enhance the strength of aircraft engine turbine discs
- Unlocking the potential of conventionally non-formable and non-weldable aerospace materials via 3D printing

Capabilities and facilities

- Multi-scale and correlative 3D imaging from aerospace parts down to the atomic scale
- Simulation of industrial thermo-mechanical processes on the laboratory-scale
- State-of-the art computational modelling of processing and materials properties to guide the design of future advanced manufacturing processes and new aerospace alloys

Our partners

- International and Australian high-performance alloy manufacturers

- Microscopy Australia
- Defence Science Technology (DST) in Australia
- Oak Ridge National Laboratory (ORNL) in the US