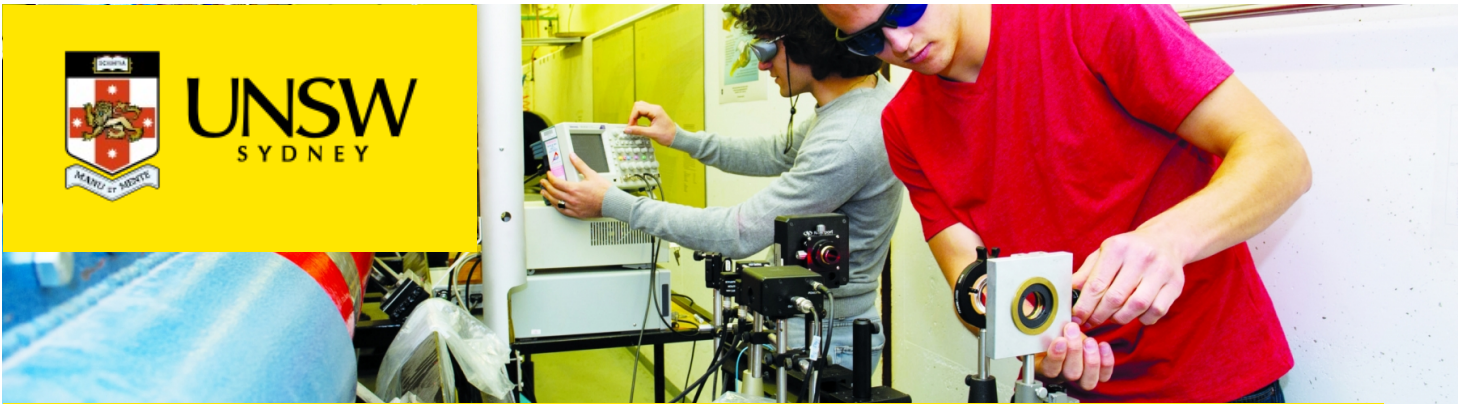




**UNSW**  
SYDNEY



## Hypersonic Aerodynamics

**Reducing the risk of high-speed flight testing and development through the application of scaled, dynamic free-flight testing in wind tunnels.**

### Competitive advantage

- Pioneering the use of highly-instrumented, low-inertia, dynamically-scaled, rapidly-prototyped, models with on-board instrumentation for free-flight testing in hypersonic conditions in ground-based test facilities
- Measurement of the aerodynamic derivatives of a design across a range of attitudes in a single experimental run using a unique combination of on-board instrumentation, including miniature inertial measurement units, in tandem with high-speed video tracking. This technique offers the unique ability to quickly validate numerically-derived aerodynamic databases using a small number of wind tunnel experiments
- Ability to investigate high-speed separations including multi-stage separation and stores release and to quantify the associated multi-body aerodynamics

### Impact

- Tunnel-based, free-flight testing helps to reduce the requirement and risks associated with expensive flight testing of high-speed vehicle designs and configurations. Tunnel-based free-flight testing allows for assessing the accuracy of numerical designs and identifying unforeseen issues using ground-based test facilities. Changes to geometric design, mass distribution and separation approach can be rapidly asse

### More Information

Professor Andrew Neely

School of Engineering and Technology

T: +61 (0) 2 6268 8251

E: [a.neely@unsw.edu.au](mailto:a.neely@unsw.edu.au)

UNSW Knowledge Exchange

[knowledge.exchange@unsw.edu.au](mailto:knowledge.exchange@unsw.edu.au)

[www.capabilities.unsw.edu.au](http://www.capabilities.unsw.edu.au)

+61 (2) 9385 5008