Retropropulsion for reusable rocket vehicles

Apologies for the short description, I am quite unwell and just trying to get something posted. Please contact me at Daniel.mitchell@monash.edu to discuss if you have any questions.

The project will involve the design and installation of a rocket retropropulsion test article in our supersonic wind tunnel. This is part of a nascent collaboration with DLR in Germany, who are interested in how firing retropropulsive systems during high-speed flight can destabilize the vehicle; being able to do this is critical for the design of the next generation of reusable launch vehicles.

In this project you would design a new retropropulsor to be installed in our tunnel, and then use high-speed schlieren imaging to observe its behaviour. You would then apply modal decomposition techniques to try to work out any mechanisms of instability or resonance.

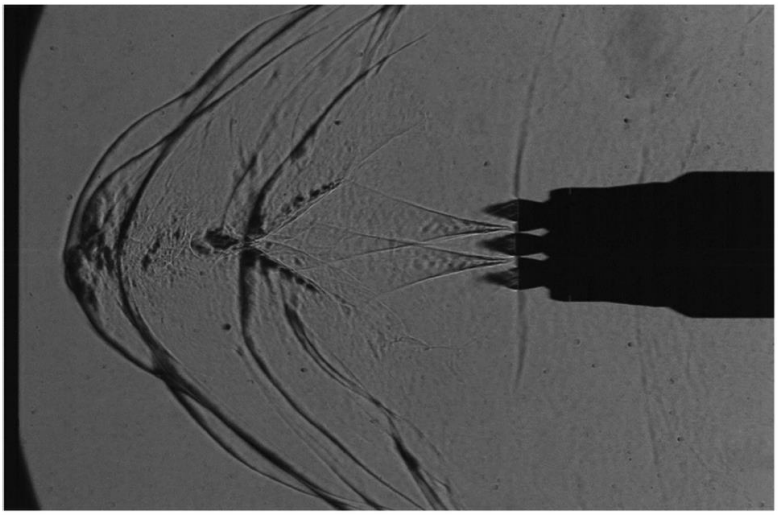

Figure 1: Exemplar retropropulsion shadowgraph (Marwege and Gulhan 2023)

To undertake this project you should:

1. Be contacting me before applying to discuss.
2. Not be scared of loud noises (the tunnel is loud).
3. Have an interest in pursuing postgraduate study in aerospace.