

Pressure Neutral Acoustic Wind tunnel

University of Bristol

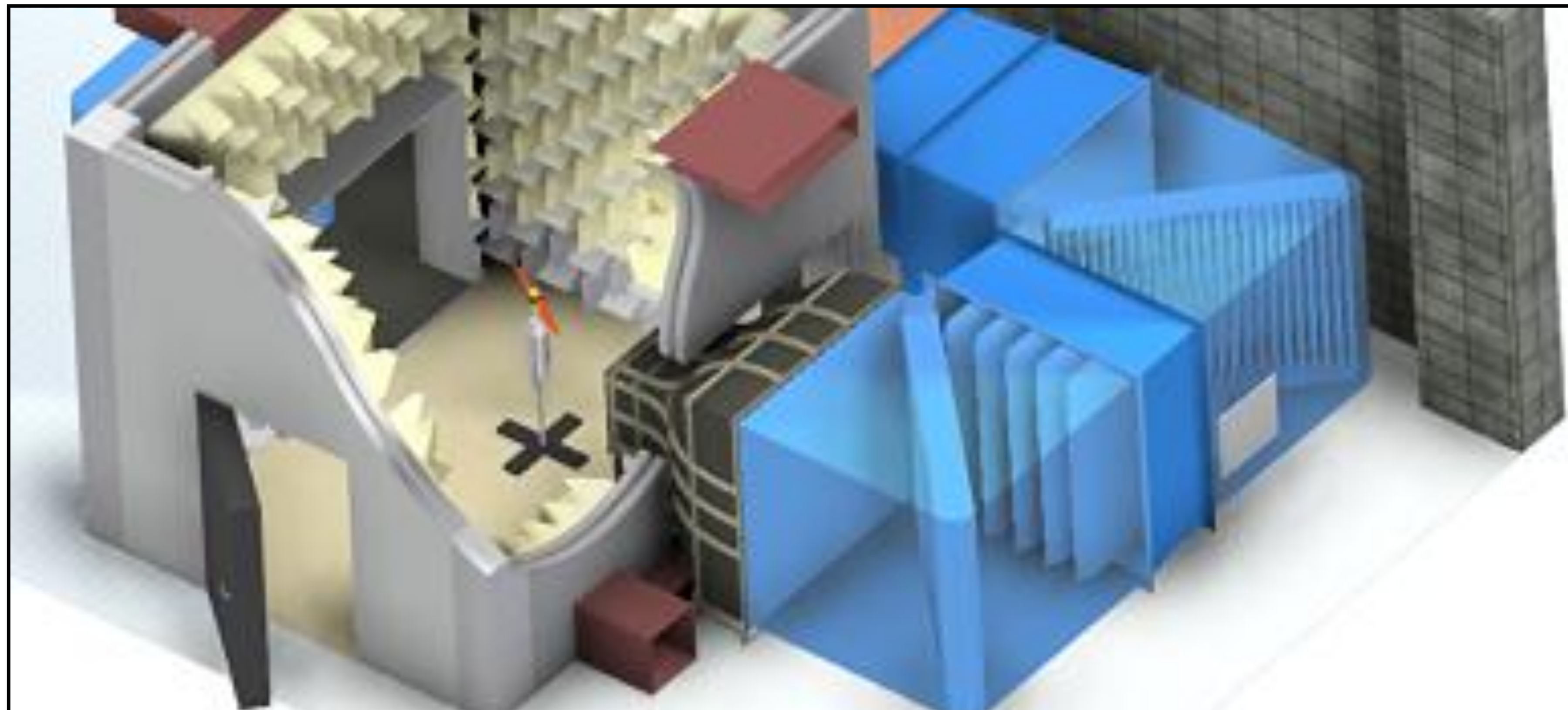
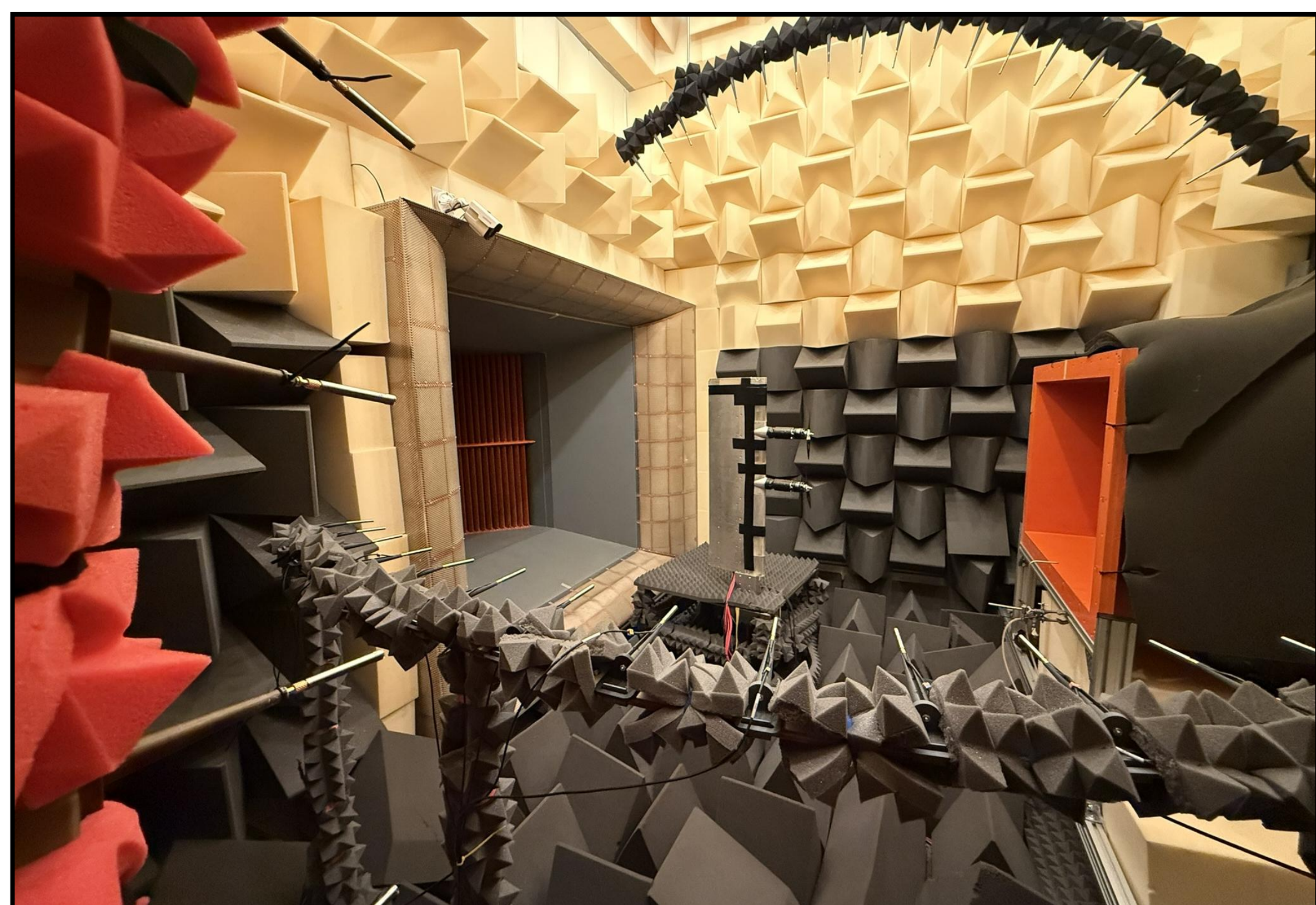
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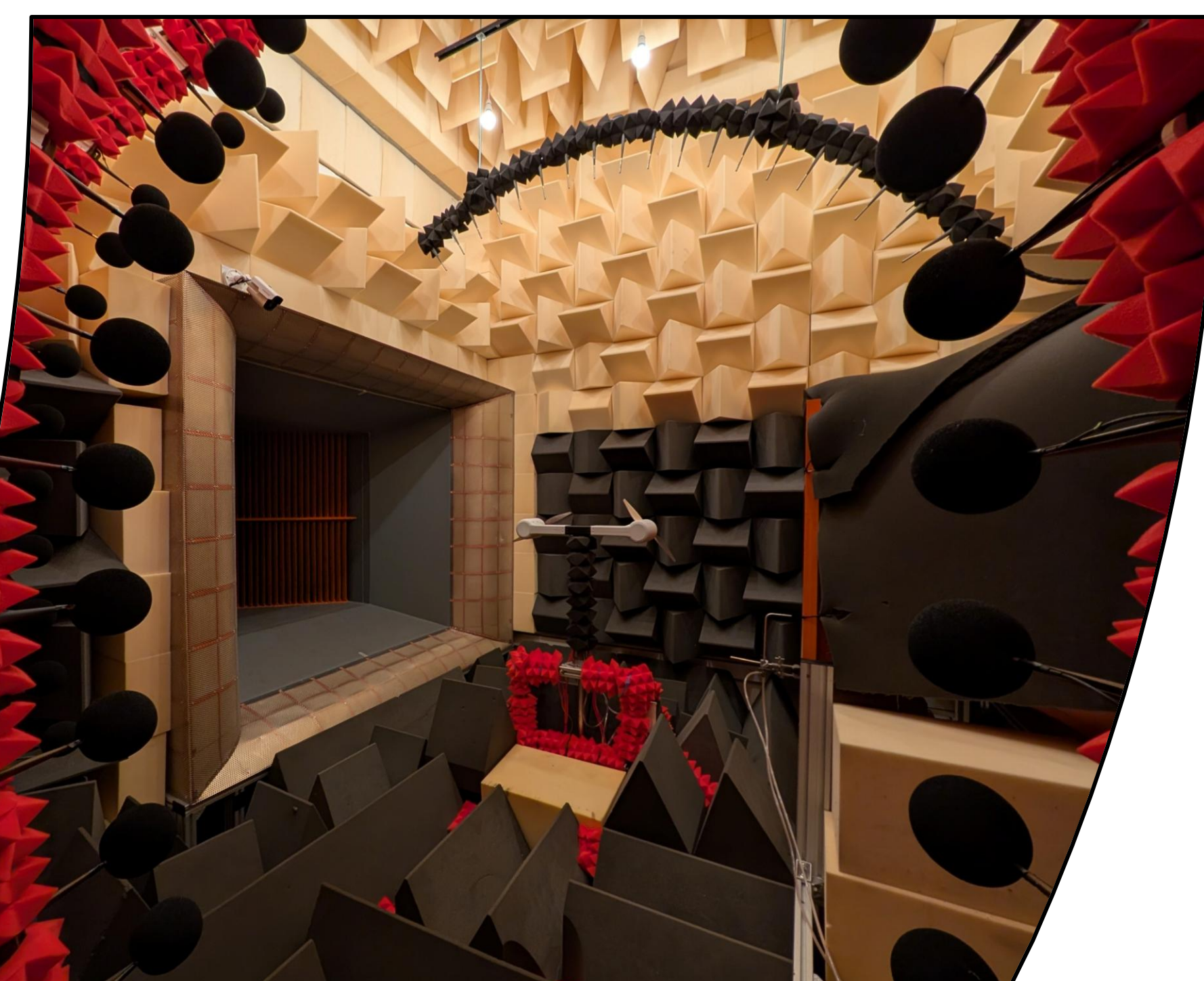
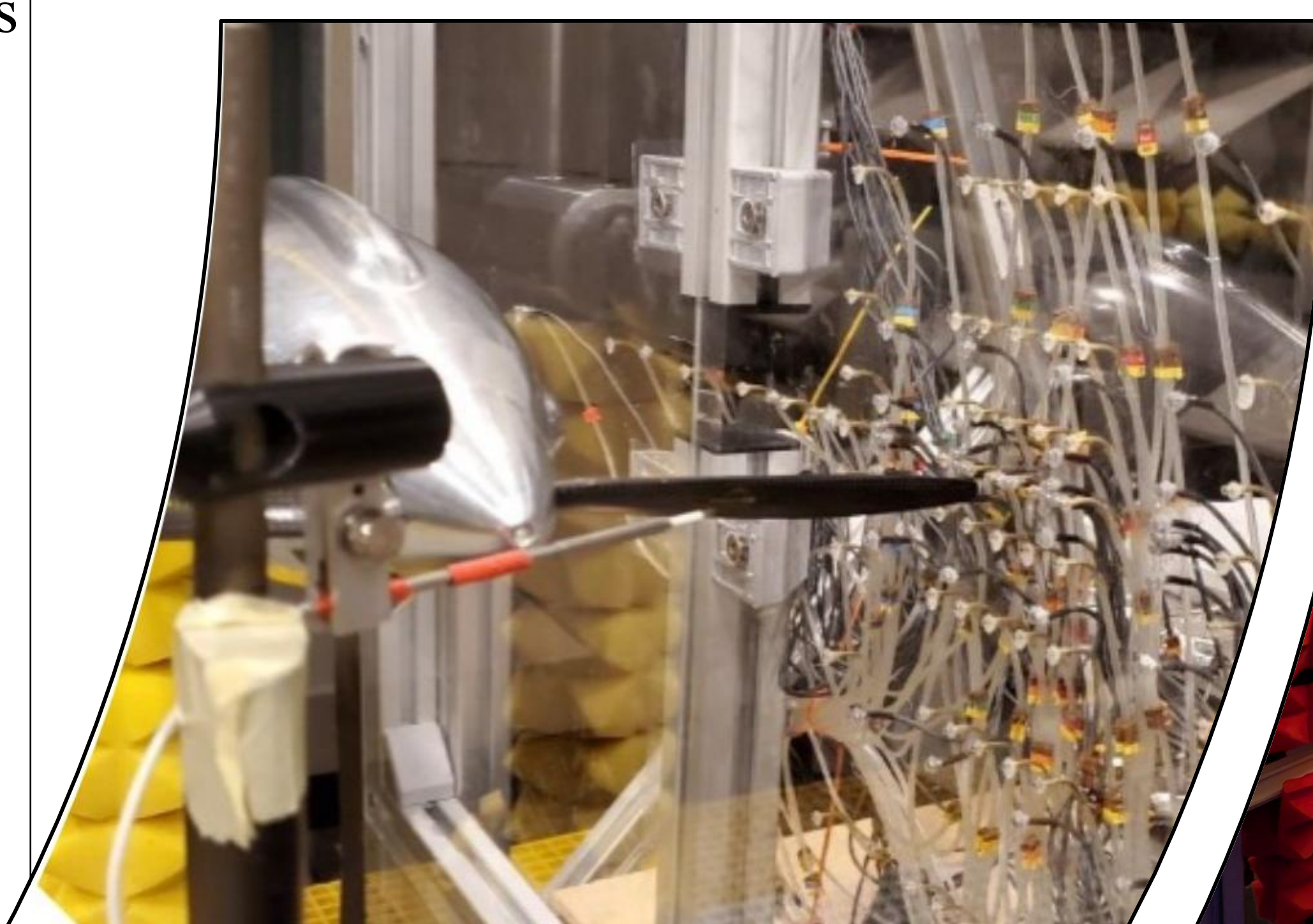
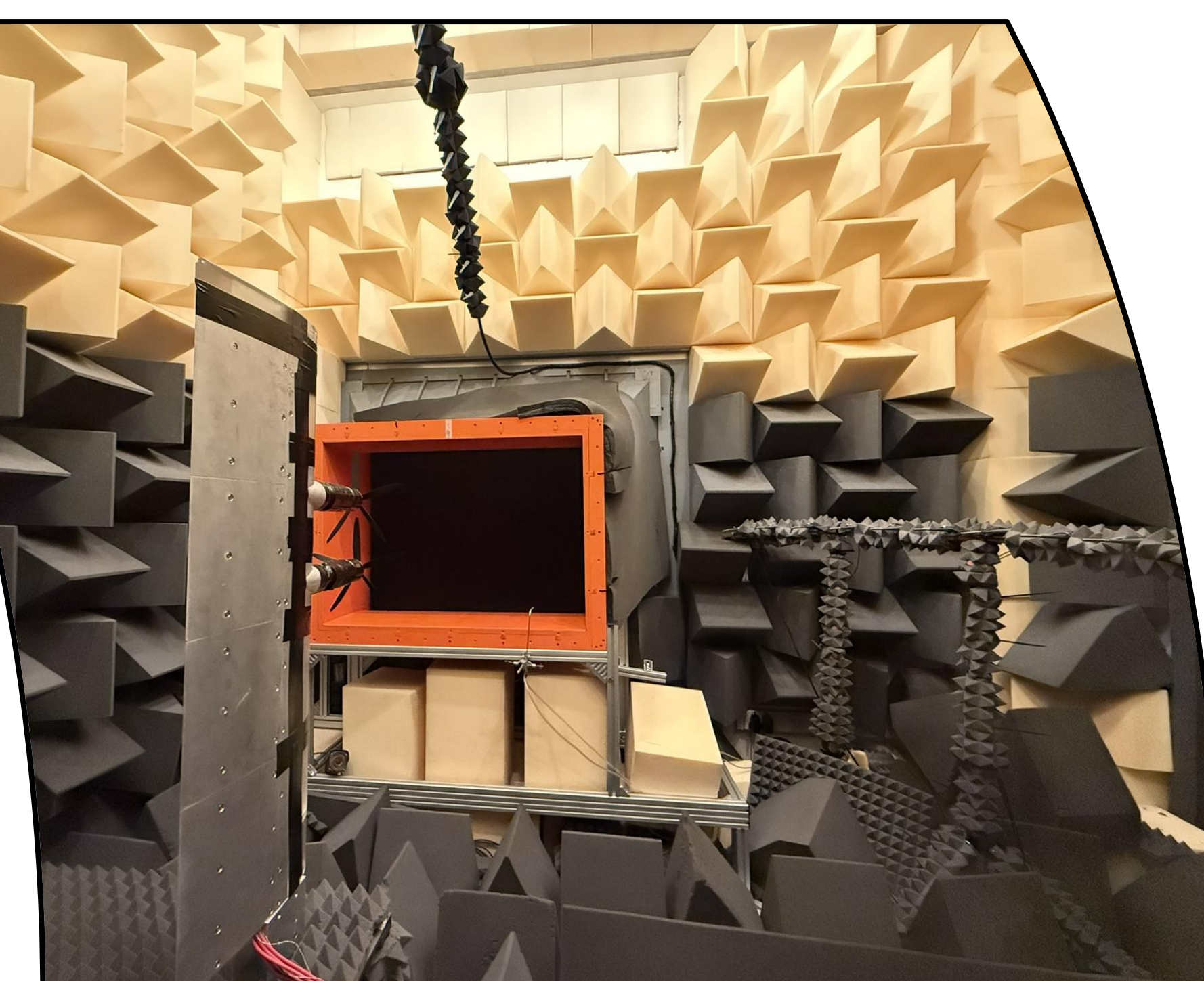
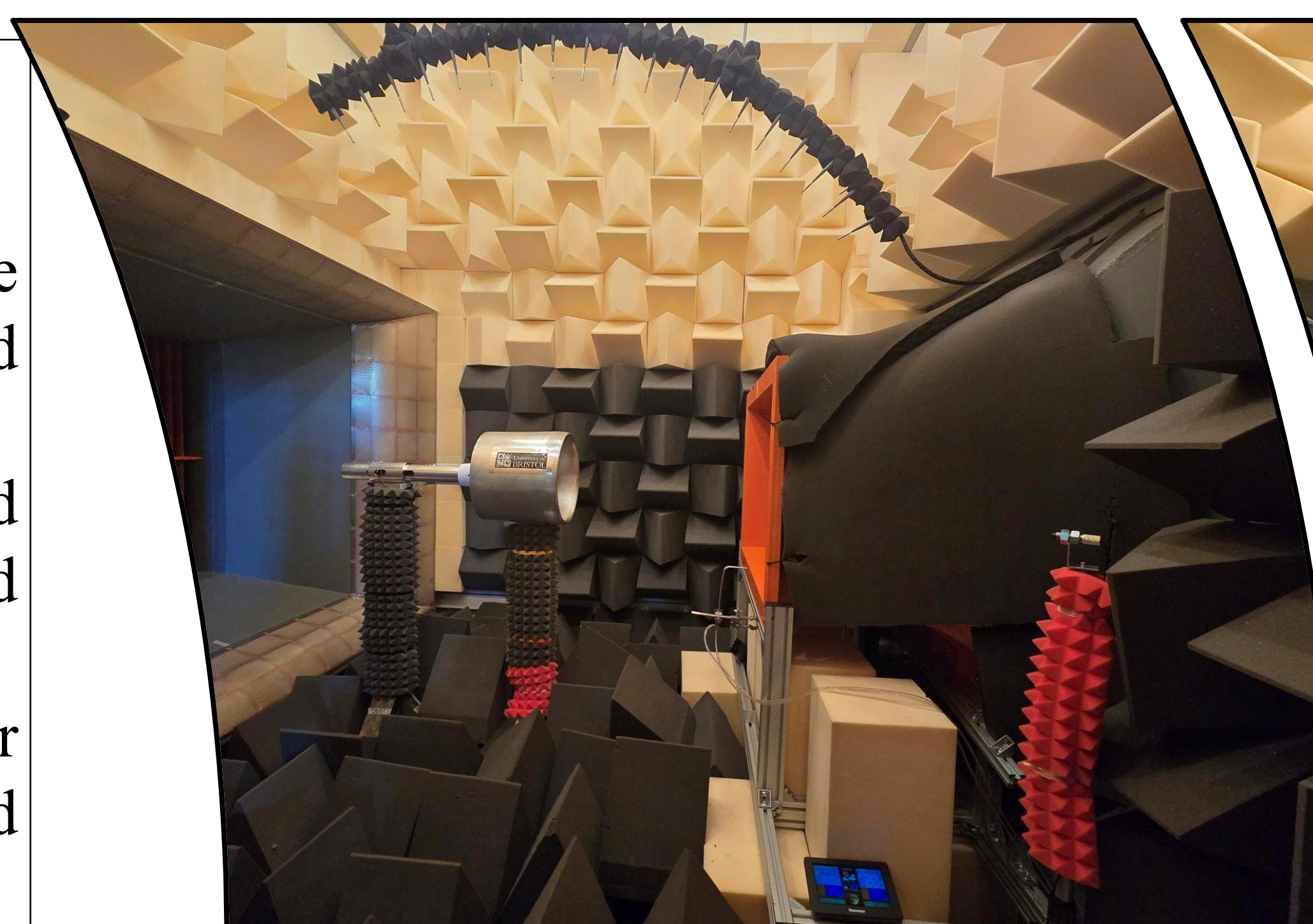
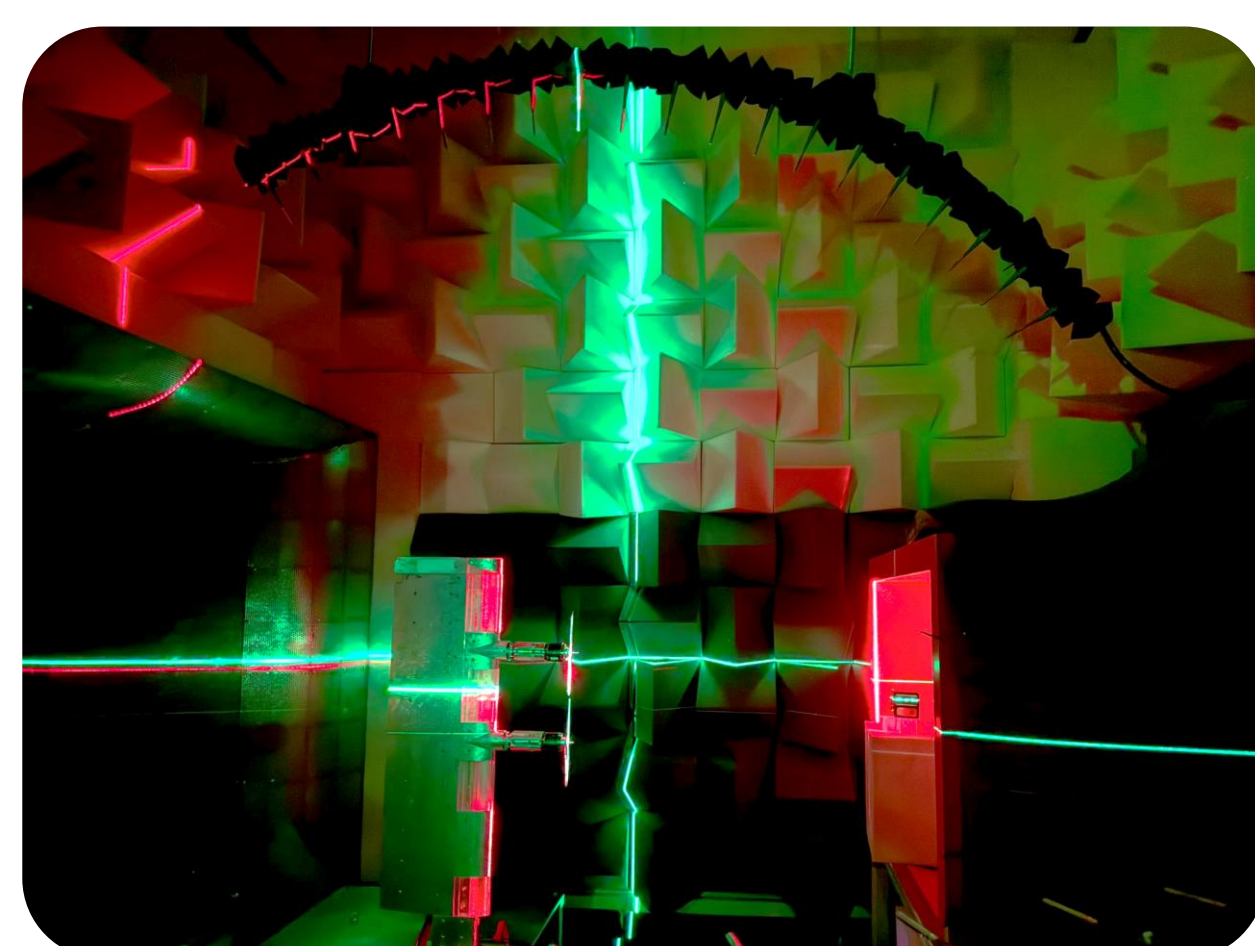


Facility capabilities

- A closed-loop, open-jet wind tunnel featuring a **1 m wide × 0.7 m high** nozzle and a **3.8 m long × 4.2 m wide anechoic chamber**.
- Equipped with flow conditioners that reduce the free-stream turbulence intensity to **0.2%**, along with two sets of large splitter silencers that significantly reduce background noise.
- Powered by an axial fan and regulated by a dedicated control system, delivering stable free-stream velocities ranging from **5 to 35 m/s**. Incorporates four rectangular openings positioned above and below the nozzle and collector on both sides of the chamber to maintain pressure-neutral conditions.
- Provides extensive measurement capabilities, including far-field microphone arrays, a large far-field acoustic beamforming array, a six-axis force plate, miniature load cells, pressure scanners, data-acquisition and I/O modules, two- and three-dimensional PIV systems with phase-locked measurements for propeller testing, and hot-wire and hot-film constant-temperature anemometry.

Propeller & rotor aerodynamic and aeroacoustic research

- Advance understanding of key noise aspects and evaluate noise suppression and shielding effectiveness advanced propulsion systems
- Investigate key propulsion-airframe integration issues and minimize detrimental installation effects to reduce noise and greenhouse gas emissions
- Facilitate the development of ultra-high aspect ratio wings for large transport aircraft using innovative aerodynamic and aeroelastic designs.
- Understanding of turbulence/gust interaction with aerofoils and high-lift-devices.



Industrial partners and funding agencies

