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The Aerodynamic Challenges of eVTOL Aircraft Design

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Date: Thursday 20 November 2025, 18:00

Location: HAW Hamburg, Berliner Tor 5, Hörsaal 01.10 (in-person only!)

Recent years have seen an explosion in aeronautical creativity, driven in part by the advent of cheap, powerful electric drive systems and efficient batteries. According to their many proponents, electric-powered aircraft that are capable of vertical takeoff and landing (aka. eVTOL aircraft) promise a future of quiet, efficient urban transport in which travel by air will be seen to be as commonplace and simple as hailing a taxi.

The aerodynamics of these vehicles is very complex, however. The wakes generated by their multiple rotors in the process of generating lift or thrust interact with each other to cause vibration and control problems, transitioning from vertical to horizontal flight is not a simple process, and, particularly when landing or taking off, a range of aerodynamic, structural dynamic and acoustic issues threaten to materialise.



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To what extent can, and has, the aerodynamic development of these vehicles benefited from past experience with helicopters and other historical VTOL aircraft, and to what extent have and will they require new knowledge to be derived and new design principles to be developed? To what extent do these vehicles pose new challenges that will need to be addressed in novel and creative ways? Perhaps more importantly, what can the study of this new class of vehicles add to the body of aeronautical knowledge as a whole?

Dr Richard Brown is an internationally respected authority on rotorcraft aerodynamics, with over thirty-five years of experience in the field. After a long academic career, he now co-directs Sophrodyne Aerospace, an aerodynamics consultancy based in Glasgow.

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