

Monday, August 28, 2023

10:30 am – 11:30 am, 8500BH Klug Memorial Room



Sound, Flames and Aerodynamics for a Decarbonized Future

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ABSTRACT: This seminar will present research on sound (aeroacoustics), flames and aerodynamics for a decarbonized future. Specifically, it will address research on **thermoacoustic instability** and **bluff body aerodynamics** which contributes to this aim. The talk will begin by describing the fundamentals of thermoacoustic instability, along with multi-scale methods for its computational prediction. Research avenues relevant to the move towards zero-carbon fuels will be elaborated, for example the response of hydrogen flames and entropy noise. New ideas for acoustic damping for suppression of thermoacoustic instability will be discussed. The talk will then change tack to describe how bluff body aerodynamics can contribute to energy demand reduction for electric road vehicles. Research on the wake behind simplified road vehicles, including modelling, simulation and active control of random bi-modal wake switching events, will be presented. Finally, the talk will touch upon how the aerodynamics of high-rise buildings can be modified to increase resilience of urban structures to extreme wind events.

BIO: Aimee Morgans is Professor of Thermofluids in the Department of Mechanical Engineering at Imperial College London. Her research interests are in aeroacoustics, thermoacoustics, aerodynamics and flow control. She studied undergraduate Engineering at Cambridge University, remaining at Cambridge for a PhD on aeroacoustics. She then held a Royal Academy of Engineering 5-year Research Fellowship in the UK, joining Imperial College as a Lecturer (Assistant Professor) in 2007. She has been at Imperial since, becoming full Professor in 2017. She formerly held a 5-year European Research Council (ERC) Starting Grant, and currently holds a 5-year ERC Consolidator Grant, both on thermoacoustic instability. She was elected a Fellow of the UK's Royal Academy of Engineering in 2021.