SEMINAR SERIES

力学与工程科学学院 航空航天工程系
湍流与复杂系统国家重点实验室

题目：Development and Validation of Conditional Source-term Estimation Model for Turbulent Combustion

报告人： Xiaohang (Leo) Fang, University of Calgary, Canada

报告内容摘要：

While significant efforts have been made to renewable power generation and the electrification of ground transportation for hard-to-electrify transportation industries (e.g., rail, marine, and aviation), novel thermal propulsion systems that can reduce carbon footprint are also much needed. Research groups worldwide are exploring alternative fuels, novel combustion chamber designs, and increased operating envelopes to promote low carbon footprint combustion modes. However, accurate prediction of combustion in such systems is challenging because of the complex interactions between turbulence and chemical reactions. In particular, the presence of partially premixed flames in these systems has demonstrated significant challenges for current model approaches. Therefore, the development of novel combustion models suitable for propulsion and energy systems at partially premixed conditions is much needed. Moment-based numerical models offer the potential for simulating diverse combustion scenarios, but their application to practical engineering systems with varied fuels beyond methane requires further investigation. This talk explores the challenges and benefits of utilizing such models in real-world energy and propulsion contexts where specific engineering applications in Canada is also highlighted.

报告人简介：

Dr. Leo Fang is an Assistant Professor at the Schulich School of Engineering, University of Calgary, and a visiting academic at the Thermal Propulsion System Research Group (TPSRG) at the University of Oxford. Prior to his current role, he served as an engineering science lecturer and research fellow at Oriel & Sommerville College. His research focuses on turbulent combustion modeling and the development of innovative computational diagnostic tools. Dr. Fang received his BASc in Mechanical Engineering from the University of British Columbia (2016) and earned his PhD in Engineering Science from the University of Oxford (2019). His work is currently supported by several funding organizations, including the John Fell Fund (Oxford), UK Research and Innovation (UKRI), the Natural Sciences and Engineering Research Council of Canada (NSERC), Alberta Innovate, and the University of Calgary. He is currently leading a Hydrogen Center of Excellence project on hydrogen gas burners. Recently, Dr. Fang hosted the Combustion Institute Canadian Section (CICS) spring technical meeting and he will host the 2027 International Conference in Numerical Combustion (ICNC).

时间：2025 年 12 月 26 日（周五）下午 14:00

地点：北京大学 新奥工学大楼 2047 会议室

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联系人：陈帜 chenzhi@pku.edu.cn