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：High Fidelity Simulations of Hydrogen and Ammonia Combustion for Zero-Carbon Transportation and Power

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报告内容摘要：

Hydrogen and ammonia as a fuel has attracted increasing research interests in recent years due to their relevance to viable e-fuels towards carbon-neutral power and transportation. Despite the simplicity in oxidation pathways, combustion of hydrogen and ammonia involves pronounced effects of fast-diffusing major and intermediate species, leading to interesting flame dynamics in turbulent and high pressure conditions. This presentation will provide an overview of recent studies at KAUST on hydrogen and ammonia combustion from fundamental turbulent characteristics using direct numerical simulations to reveal local structures and statistical characteristics of turbulent premixed flames to new internal combustion engine concept using pre-chamber with gaseous fuels. Recent developments of reduced order models using machine learning for high fidelity simulations will also be briefly discussed.

报告人简介：

Hong G. Im received his B.S. and M.S. in from Seoul National University, and Ph.D. from Princeton University. After postdoctoral researcher appointments at the Center for Turbulence Research, Stanford University, and at the Combustion Research Facility, Sandia National Laboratories, he held assistant/associate/full professor positions at the University of Michigan. He joined KAUST in 2013 as a Professor of Mechanical Engineering and currently serves as Deputy Chair of the Clean Energy Research Platform. He is a recipient of the NSF CAREER Award and SAE Ralph R. Teetor Educational Award, and has been inducted as an International Member of the National Academy of Engineering of Korea, a Fellow of the Combustion Institute and American Society of Mechanical Engineers (ASME) and an Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA). He has also served as an Associate Editor for the Proceedings of the Combustion Institute, and currently on the Editorial Board for Energy and AI. Professor Im's research and teaching interests are primarily fundamental and practical aspects of combustion and power generation devices using high-fidelity computational modeling. Current research activities include direct numerical simulation of turbulent combustion at extreme conditions, large eddy simulations of turbulent flames at high pressure, combustion of hydrogen and e-fuels, spray and combustion modeling in advanced internal combustion engines, advanced models for pollutant formation, plasma-assisted combustion, and reduced order models for accelerated computing.

时间：2025 年 7 月 8 日（周二）中午 12:20 – 14:00

地点：北京大学 新奥工学大楼 3048 会议室

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