

# OpenFOAM & Combustion Simulation



## Particle-Laden and Droplet-Laden Flows

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**Host:** Prof. Bosen Wang (Beihang University)

**Register:** [https://nus-sg.zoom.us/webinar/register/WN\\_KT3Une3wTe-8IqktANnV7Q](https://nus-sg.zoom.us/webinar/register/WN_KT3Une3wTe-8IqktANnV7Q)



### Abstract

The transport of polydispersed droplets and solid particles in turbulent flows is relevant to a wide range of applications such as particle dispersion in the atmosphere, fire suppression systems and liquid spray fuel injection in diesel engines and gas turbines. The dynamics of droplets and particles transported by a turbulent flow involves a complex series of interrelated phenomena including dispersion, surface growth or shrinkage, breakage, agglomeration and nucleation. In this talk, Dr. Salehi will present an effective model based on the probability density function (PDF) form of the population balance equation (PBE) for polysized and polyshaped droplets and solid particles in turbulent flows. A key novelty of this method lies in the inclusion of explicit consideration of the inertial effects and the shape of particles in the PDF-PBE formulation.

### About the Speaker

Dr. Fatemeh Salehi is an Associate Professor at the School of Engineering, Macquarie University, Australia and is currently a visiting A/Prof at the University of Michigan, USA. She received her PhD from the University of New South Wales in 2015 and then worked as a Postdoctoral Research Fellow at the University of Sydney before joining Macquarie as a faculty member in 2018. Her expertise is in the development of physical models for computational fluid dynamic (CFD) simulations of single- and multi-phase flows to advance new energy technologies. She is particularly interested in clean fuels such as hydrogen, ammonia, biofuel, and biomass. Dr. Salehi is a Fulbright Fellow, an executive member of the Combustion Institute (ANZ), a member of the Scientific Advisory Board of Blue Economy Corporative Research Centre, and a member of Working Groups of Standards Australia for the development of hydrogen standards.

