Stochastic computational fluid dynamics – recent applications in combustion, nanoparticle synthesis and two-phase flows

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Stochastic computational fluid dynamics (CFD) are elegant approaches for solving continuum turbulent flow problems. Their great attraction is that they provide inherently closed formulations for non-linear, small scale processes such as chemical reactions and discrete particle dynamics. Although stochastic approaches have traditionally been considered to be computationally expensive, it is possible to alleviate this by complementing them with low-dimensional manifold and dynamic binning methods. This seminar will present recent stochastic CFD research from the University of Sydney with applications in combustion, soot and nanoscale materials synthesis, and two-phase flows.