

## UNCERTAINTY CHARACTERIZATION AND ERROR CONTROL TO ENABLE PREDICTIVE SIMULATIONS

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### MINISYMPOSIUM

The collection of algorithms and methods for describing complex physical systems, such as computational fluid dynamics (CFD), is increasing rapidly and when these capabilities are combined with data from physical systems, they provide quantitative descriptions in detail and coverage that were not possible only a decade ago. However, with more experimental/simulated data and algorithms comes the challenge of assessing the reliability predictions with proper characterizations of errors and uncertainties. Thus, the issues of validation and verification in numerical simulation of complex systems are still of critical importance.

The purpose of this mini-symposium is to discuss the challenges and recent developments on uncertainty quantification and numerical error assessment and control with applications to challenging multi-scale and/or multi-physics problems. Topics will include, but are not limited to:

- Assessment/control of uncertainties and numerical errors for unsteady applications
- Enriched uncertainties quantification approach using data-informed methods
- Adaptive approaches for error control
- Novel algorithm developments for UQ and error analysis
- Combined error control either using high fidelity or low fidelity (or reduced order) models.