



**MUMS Agent-Based Modeling and
Uncertainty Quantification Workshop
March 11-12, 2019**

SPEAKER TITLES/ABSTRACTS

Dave Higdon
Virginia Tech

“Bayesian Model Calibration and Prediction Applied to (Stochastic) Epidemic Simulations”

Agent-based models (ABMs) use rules at the individual level to simulate a social, or social-technical system, producing structured behavior when viewed at an aggregated level. For example, dynamic network simulation models commonly evolve a very large collection of agents interacting over a network that evolves with time. Such models are often used simulate epidemics or transportation, typically producing random trajectories, even when model parameters and initial conditions are identical. This introduces a number of challenges in designing ensembles of model runs for sensitivity analysis and computer model calibration. This talk will go through a case study of a recent epidemic, seeking to forecast the epidemic’s behavior given initial administrative information. This talk discusses two different approaches for combining observations with this model for estimation and prediction. The first uses methods from traditional computer model calibration; the second approach - still under development - uses a sequential Monte Carlo approach.