



**MUMS Program Opening Workshop  
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**SPEAKER TITLES/ABSTRACTS**

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*“UQ Data Fusion: An Introduction and Case Study”*

Data Fusion is the process of integrating multiple data sources to produce more consistent, accurate, and useful information than that provided by any individual data source. We show how this may be accomplished in the Bayesian paradigm by constructing non-exchangeable hierarchical models with submodels for each of the several data sources.

In the UQ setting, where we wish to synthesize evidence from large and slow Simulation models and possibly other data sources, it can be much more efficient to construct Gaussian Process Emulators of the Simulation models, and perform Data Fusion in the Emulators rather than the Simulators.

We introduce an abstract model setting for Fusion, and illustrate several examples from a single case study: the forecasting of hazard from Pyroclastic Density Currents (PDCs) near an active volcano.