MARQUETTE
UNIVERSITY

HELEN WAY KLINGLER
COLLEGE OF ARTS AND SCIENCES

Department of Mathematics, Statistics and Computer Science

COLLOQUIUM ANNOUNCEMENT

Short-term probabilistic hazard mapping -- forecasting catastrophe without stationary assumptions

Elaine Spiller
MSCS Department
Marquette University

3:30 PM, Thursday, November 30, 2017

Cudahy Hall, Room 401

Abstract

Geophysical hazards -- landslides, tsunamis, volcanic avalanches, etc. -- which lead to catastrophic inundation are rare yet devastating events for surrounding communities. The rarity of these events poses two significant challenges. First, there are limited data to inform aleatoric scenario models, how frequent, how big, where. Second, such hazards often follow heavy-tailed distributions resulting in a significant probability that a larger-than-recorded catastrophe might occur. To overcome this second challenge, we must rely on physical models of these hazards to "probe" the tail for these catastrophic events. Typically these physical models are computationally intensive to exercise and a probabilistic hazard map relies on an expensive Monte Carlo simulation which samples the scenario model. This approach forces one to focus resources on a single scenario model based on one set of assumptions. We will present a surrogate-based strategy that allows great speed-up in Monte Carlo simulations and hence the flexibility to explore the impact of non-stationary scenario modelling on short term forecasts. Additionally, this approach provides a platform to perform uncertainty quantification on hazard forecasts.

POST COLLOQUIUM REFRESHMENTS SERVED IN CUDAHY HALL, ROOM 342 AT 4:30 P.M.