LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN **INSTITUT FÜR STATISTIK**

Gaussian Process Emulation of Computer Models with Massive Output

Jim Berger
(Duke University, USA)

January 31, 2018, 16:00 (s.t.)
Ludwigstr. 33, Seminarraum

Often computer models yield massive output; e.g., a weather model will yield the predicted temperature over a huge grid of points in space and time. Emulation of a computer model is the process of finding an approximation to the computer model that is much faster to run than the computer model itself (which can often take hours or days for a single run). Most successful emulation approaches are statistical in nature, but these have only rarely attempted to deal with massive computer model output; some approaches that have been tried include utilization of multivariate emulators, modeling of the output (e.g., through some basis representation, including PCA), and construction of parallel emulators at each grid point, with the methodology typically based on use of Gaussian processes to construct the approximations. These approaches will be reviewed, with the startling computational simplicity with which the last approach can be implemented being highlighted and its success illustrated and explained. All results will be illustrated with a computer model of volcanic pyroclastic flow, the goal being the prediction of hazard probabilities near active volcanoes.