MARQUETTE UNIVERSITY

HELEN WAY KLINGLER
COLLEGE OF ARTS AND SCIENCES

Department of Mathematics, Statistics and Computer Science

COLLOQUIUM ANNOUNCEMENT

Data assimilation for high dimensional systems: role of unstable subspace

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Cudahy Hall, Room 401

Abstract

Nonlinear filtering problems for estimation of the state of a high dimensional chaotic system given noisy, partial observations of the systems are widely known as data assimilation in the context of earth sciences. The characteristics of the dynamics of the system, in particular the unstable subspace, play a crucial role in determining the asymptotic in time properties of the filter, as discussed extensively by Anna Trevisan and collaborators when introducing a method known as assimilation in the unstable subspace (AUS).

This talk will focus on our recent work related to the convergence of the Kalman filter covariance matrix onto the unstable-neutral subspace for a linear, deterministic dynamical system with linear observation operator. I will also discuss a Bayesian formulation of the notion of indistinguishable states and its relation to the unstable subbspace and the posterior distribution.

Joint work with Marc Bocquet, Karthik Gurumoorthy, Alberto Carrassi, Colin Grudzien, Chris Jones.