



THE UNIVERSITY OF
CHICAGO

THE COMMITTEE ON
COMPUTATIONAL AND
APPLIED MATHEMATICS

COLLOQUIUM

ALEX BLUMENTHAL

School of Mathematics
Georgia Institute of Technology

Tractability of Chaotic Dynamics in Noisy Systems

THURSDAY, November 6th at 4:00 PM

Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

ABSTRACT

Many real-world systems exhibit dynamical chaos, characterized by sensitive dependence on initial conditions and intricate, seemingly disordered behavior. While existing abstract tools from smooth ergodic theory provide a rich framework for understanding chaotic dynamics, verifying this framework in concrete systems remains a notoriously difficult problem. Even in low-dimensional toy models, rigorous proofs often lag behind compelling numerical evidence.

Remarkably, this problem becomes far more tractable when systems are subjected to external, time-dependent stochastic forcing. In such settings, the scope of systems for which chaotic hallmarks can be rigorously established expands dramatically, offering substantive progress toward the original promise of chaos theory: to explain and quantify dynamical disorder in nature.

In this talk, I will present a series of results along these lines from joint work with many, including Lai-Sang Young, Jinxin Xue, Jacob Bedrossian, and Sam Punshon-Smith.

Organizers:

Guillaume Bal, Department of Statistics (CCAM), guilleaumbal@uchicago.edu & Nisha Chandramoorthy, Department of Statistics (CCAM), nishac@uchicago.edu, Daniel Sanz-Alonso, Department of Statistics (CCAM), sanzalonso@uchicago.edu

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