



THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, and Statistics
SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

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Improving Numerical Weather Predictions Using Ideas from Nonlinear Dynamics

THURSDAY, January 10, 2013 at 4:30 PM

Eckhart 133, 5734 S. University Avenue

ABSTRACT

Modern weather forecasts are initialized with a 10 billion variable estimate of the Earth's atmospheric state. This initial condition is typically the result of 'data assimilation,' the process by which satellite observations are combined with prior forecasts to produce a best guess. Predictions of the future state are then made by integrating a collection of perturbations of this best guess, and the resulting variance represents the forecast uncertainty. This talk will discuss the state-of-the-art in weather prediction in the context of our group's efforts to improve forecast methodology. We leverage results from low-dimensional nonlinear dynamical systems to suggest algorithms for reducing forecast error, and demonstrate success using an experimental apparatus analogous to Lorenz's 1963 model of convection.

Organizers:

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