



THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS COLLOQUIUM

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What is Bayesian Inference, Why is it Useful in Earth Science
and Why is it Challenging to do Numerically?

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Via ZOOM

ABSTRACT

I will first review Bayesian inference, which means to incorporate information from observations (data) into a numerical model, and will give some examples of applications in Earth science. The numerical solution of Bayesian inference problems is often based on sampling a posterior probability distribution. Sampling posterior distributions is difficult because these are usually high-dimensional (many parameters or states to estimate) and non-standard (e.g., not Gaussian). In particular a high-dimension causes numerical difficulties and slow convergence in many sampling algorithms. I will explain how ideas from numerical weather prediction can be leveraged to design Markov chain Monte Carlo (MCMC) samplers whose convergence rates are independent of the problem dimension for a well-defined class of problems.

Organizer:

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