



# Scientific Computing Group

## Division of Applied Mathematics

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### Scientific Computing Group Seminars - Detail View

*Speaker:* N. Zabaras

*Affiliation:* Mechanical and Aerospace Engineering, Cornell University

*Talk Title:* Modeling Stochastic Inverse Problems Using a Sparse Grid Collocation Approach

*Invited by:* George Karniadakis

*Time:* Nov. 09 2007 11 a.m.

*Location:* 182 George Street, Room 110

*Abstract:*

A scalable, parallel methodology for stochastic inverse/design problems is formulated through the representation of the underlying uncertainties and the resultant stochastic dependent variables using a sparse grid collocation methodology. A novel stochastic sensitivity method will be introduced based on multiple solutions to deterministic sensitivity problems. This methodology transforms the stochastic inverse/design problem to a deterministic optimization problem in a larger-dimensional space that is subsequently solved using deterministic optimization algorithms. Various illustrative examples with multiple sources of uncertainty will be provided to showcase the developed framework including inverse thermal problems in random heterogeneous media.

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