UC MERCED

SCHOOL OF NATURAL SCIENCES
APPLIED MATHEMATICS SEMINAR 291

Uncertainty Quantification and Numerical Analysis: Interactions and Synergies

Daniela Calvetti
Department of Mathematics, Applied Mathematics and Statistics
Case Western Reserve University

Date: 4/7/17
Time: 1:30 PM - 3:00 PM
Location: COB 120

For more information contact:
Noemi Petra; npetra@ucmerced.edu

ABSTRACT

The computational costs of uncertainty quantification can be challenging, in particular when the problems are large, or real time solutions are needed. Numerical methods appropriately modified can turn into powerful and efficient tools for uncertainty quantification. Conversely, state-of-the-art numerical algorithms reinterpreted from the perspective of uncertainty quantification can become much more powerful. This presentation will highlight the natural connections between numerical analysis and uncertainty quantification and illustrate the advantages of re-framing classical numerical analysis in a probabilistic setting.

BIO:

Prof. Calvetti received her "laurea" in Mathematics from the University of Bologna in 1980 and her PhD in Mathematics from the University of North Carolina at Chapel Hill in 1989. After appointments at the North Carolina State University, University of Colorado-Pueblo and the Stevens Institute of Technology, she joined the department of mathematics at Case Western Reserve University in 1997, where she is now the James Wood Williamson professor of mathematics. Prof. Calvetti's first research activity was in the area of numerical linear algebra and orthogonal polynomials, with special attention to structured matrices and iterative methods for large-scale linear systems. As she started working on the numerical solution of discrete inverse problem, her research began including elements of Bayesian inference to account for information of qualitative type into the solution. As she became involved with modeling integrated metabolic system within the Center for Modeling Integrated Metabolic Systems, her research started to address the problem of constructing mathematical models and estimating the model parameters within a Bayesian inference framework. She is the author and coauthor of about 150 articles, and co-author, with E. Somersalo, of the books "Bayesian Scientific Computing: 10 Lectures on Subjective Computing" and " Computational Mathematical Modeling: an Integrated Approach Across Scales."