

# Center for Environmental & Applied Fluid Mechanics

## **Spectral Methods for Uncertainty Quantification in Fluid Flow Simulations**

**Presented by**

**Dr. Olivier Le Maitre**  
*LIMSI, Paris, France*

This talk will review the stochastic spectral methods for uncertainty quantification and propagation in fluid flow simulations. After a brief discussion of the spectral stochastic representations based on orthogonal polynomial decompositions, I will detail the Galerkin projection schemes used to propagate uncertainty into fluid flow models. Examples of application will be shown, including simulation results for both Eulerian and Lagrangian discretizations of the Navier-Stokes equations, with special emphasis on the uncertainty characterization provided by the spectral expansion. Finally, limitations and possible improvements of the method will be discussed.

**Friday, September 12, 2008**  
**11:00 a.m., 110 Maryland Hall**