



# Applied Mathematics



## *Joint Computational Science and Engineering & Applied Mathematics Seminar*

2:30 pm Friday 4th February 2005  
At McGill, McConnell Engineering Building Room 13

“Adaptive multimodeling and local mesh refinement controlled by a posteriori error estimates”

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**Abstract:** We present a paradigm for adaptive model/mesh refinement in the finite element solution of nonlinear partial differential equations. The goal is to estimate, and subsequently equilibrate, both sources of error. To assess simultaneously modeling and discretization errors, we prove an a posteriori error estimate with dual-weighted residuals. Then, we propose an adaptive algorithm and discuss numerical examples. The methodology is validated on academic test cases and then applied to the simulation of complex-chemistry flames with different multi-component diffusion models.

