NSTD The Nuclear Science and Technology Division

SEMINAR ANNOUNCEMENT

TITLE: **Uncertainty Analysis and Optimization Methodology for the Design of Advanced Nuclear Fuel Cycles**

PRESENTED BY: **Jeffrey R. Preston**
University of Tennessee

DATE: **March 25, 2008**

TIME: **10:00 a.m.**

LOCATION: **5700, Room D-307**

With the nuclear industry's recent resurgence, focus has been placed on the long-standing problem of spent fuel storage and disposal; however, because the geologic repository is approaching full capacity, the long-term storage of spent fuel remains an issue that can be addressed in the design of advanced fuel cycles. A hybrid fuel cycle, defined here as light-water reactors creating fuel for liquid-sodium-cooled fast reactors, contains many uncertainties that affect many technical and economic aspects of strategic planning of an advanced fuel cycle. Using existing methodologies of neural networks for data interpolation, Monte Carlo parameter sampling, and Genetic Algorithm optimization, questions as to the minimization of plutonium production, repository heat load, and economic cost are investigated.