AEROSPACE & MECHANICAL ENGINEERING

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UNIVERSITY OF NOTRE DAME, NOTRE DAME, INDIANA 46556

SPEAKER: **Dr. James R. Stewart**
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Albuquerque, New Mexico

TOPIC: **ENABLING SCIENCE-BASED PREDICTIONS THROUGH VERIFICATION, VALIDATION, AND UNCERTAINTY QUANTIFICATION**

DATE: Tuesday, February 12, 2013

TIME: 3:30 p.m.

PLACE: Lower Level Auditorium, Geddes Hall

RECEPTION: 2:45 – 3:15 p.m. – 365 Fitzpatrick Hall

ABSTRACT

Verification, validation, and uncertainty quantification (V&V/UQ) play critical roles in the evolution towards predictive computational simulation capabilities. While various definitions of "predictive" could be proposed, in the current context we define it (loosely) as a simulation result, including a statement of credibility of that result, for a problem where experimental data does not exist. Such predictions, in turn, require (1) knowledge of the realism of the underlying mathematical models (i.e., validation); (2) assessment of the uncertainties associated with the models, model parameters, and environmental conditions; and (3) assessment of the solution accuracy of the corresponding computational models (i.e., verification). Science-based predictions of engineering quantities-of-interest require knowledge of uncertainties at all physical scales of the problem. Models must be parameterized in a way that can be informed (and validated) by experiments, and the uncertainties at lower scales must be properly characterized to allow for propagation to larger scales. This hierarchical approach forms the basis for science-based predictive simulations. The overall V&V/UQ framework, along with some examples, will be discussed in this presentation.

NOTE: ***If you are interested in meeting individually with Dr. Stewart, please contact Linda at 631-5431***