

**ARGONNE LEADERSHIP COMPUTING FACILITY  
SEMINAR ANNOUNCEMENT**

**April 7, 2009 (Tuesday)  
10:30 am / Building 360 / Conference Room L119**

**“Architecting FLASH –  
A Complex Multiphysics Application Code  
that Scales from Laptops to Largest Supercomputers”**

*Presented By*

**Anshu Dubey, Ph.D.**

ASC/FLASH Center, University of Chicago  
Chicago, Illinois

**Abstract**

FLASH is a publicly available high performance application code, which has evolved into a modular, extensible software system from a collection of unconnected legacy codes. Its newest incarnation, FLASH 3, consists of inter-operable modules that can be combined to generate different applications. The FLASH architecture allows arbitrarily many multiple alternative implementations of its components to co-exist and interchange with each other, resulting in greater flexibility. Further, a simple and elegant mechanism exists for customization of code functionality without the need to modify the core implementation of the source. A built-in unit test framework providing verifiability, combined with a rigorous software maintenance process, allow the code to operate simultaneously in the dual mode of production and development.

This presentation will describe the FLASH 3 architecture, with emphasis on solutions to the more challenging conflicts arising from solver complexity, portable performance and scalability requirements, and legacy codes. Additionally, the results of recent performance analysis of the science production runs on Intrepid will be included. Finally, the last section of the presentation will be about some of my work in other projects over the last few years.