



Save the Date • January 9–12, 2007 • Invitation to Follow

*The Computational Subsurface Sciences Workshop is a collaborative workshop among multiple U.S. Department of Energy (DOE) program offices. Because space is limited, participation is by invitation.*

*You will soon receive an invitation via e-mail with workshop details and registration guidelines. Please save the date on your calendar.*

## Workshop Charge

Identify computational science research needs and opportunities in the subsurface sciences and related areas, with a focus on development of next-generation numerical models of subsurface flow and process simulation. Highlighted areas will include potential tera- and peta-scale computational algorithms to enable high fidelity subsurface simulation models that fully couple key physical, chemical, geological and biological processes with new capabilities to quantify and reduce model uncertainty.

## Workshop Panels (tentative)

### Site Characterization

All numerical predictive models of subsurface phenomena require site-specific geologic data and boundary and initial conditions for each modeled quantity. Site characterization typically involves strongly nonlinear computationally challenging inverse problems.

### Validation, Verification and Uncertainty

Subsurface science problems are being analyzed with increasingly complex mathematical models. These models must be verified for accuracy and validated to ensure that they provide a reliable basis for decision-making.

### Coupled Phenomena

Many subsurface science problems of interest to the DOE involve flows of several fluids and transport of multiple reactive components. How can we gain better understanding of fundamental, coupled processes?

### Carbon Sequestration

There is increasing world-wide agreement that a much larger science-based CO<sub>2</sub> sequestration program should be developed. The aim should be to provide a science-based assessment of the prospects and costs of CO<sub>2</sub> sequestration.

### Crosscutting Technologies

What are the "grand challenges" in high fidelity subsurface science modeling? What new computer science, mathematics and information technologies will achieve scientific defensible tera- to peta-scale subsurface science models?



A U.S. Department of Energy workshop organized by the Office of Science (SC)  
Office of Advanced Scientific Computing Research in collaboration with:

Office of Fossil Energy (FE)

Office of Environmental Management (EM)

Office of Civilian Radioactive Waste Management (RW)

