DOE’s OFFICE OF SCIENCE
FISCAL YEAR 2005 MULTISCALE MATHEMATICS RESEARCH AWARDS

Award to:
Oregon State University
Ralph Showalter, Principal Investigator
$647 thousand over 3 years
Modeling, Analysis and Simulation of Multiscale Preferential Flow

Preferential flow occurs in natural porous media such as soils and aquifers due to the presence of unusually large connected pores or fast flow channels in which fluids flow at velocities much larger than the filtration velocities in the surrounding porous material. For some time it has been standard to use a two-scale approach to relate lab scale numerical models to field scale numerical models. This project will develop methods to blend scale separations so as to describe flow processes at intermediate scales and address the consequences of preferential flow patterns. This research will be of benefit to many DOE groundwater remediation programs.