

PLEASE NOTE CHANGE IN DAY, TIME, AND PLACE FOR THIS SEMINAR ONLY

**CENTER FOR FLUID MECHANICS
AND
THE FLUIDS, THERMAL AND CHEMICAL PROCESSES GROUP
OF
THE DIVISION OF ENGINEERING
SEMINAR SERIES**

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Technology, Kjeller**

**Pore Scale Simulation of Multiphase Fluid Flow and Reactive Transport in
Fractured and Porous Media**

Particle methods (smoothed particle hydrodynamics and dissipative particle dynamics), lattice Boltzmann simulation and numerical solution of the incompressible Navier-Stokes equations with interface capturing (volume-of-fluid, level-set and phase-field) have been used to simulate multiphase fluid flow and reactive transport in fractured and porous media. Particle methods are much less computationally efficient than grid-based computational fluid dynamics, but they have important advantages including rigorous mass conservation, momentum conservation and Galilean invariance. In addition, code development is relatively simple, there is no need for interface tracking/capturing, and the contact angle dynamics produced by particle models is realistic, but not necessarily correct. A variety of examples will be used to illustrate the capabilities of these models, and future research opportunities will be discussed.

**THURSDAY, MAY 1, 2008
Applied Mathematics Building
182 George Street, Room 110
4:30pm**