

Special Program in Applied Mathematics and Applied Mechanics

*Convection and deformation in the Earth interior: challenges for
modeling non-linear Stokes flow*

2014 - 06 - 04 (Wed.)

15:00 - 18:00

308, Mathematics Research Center Building (ori. New Math. Bldg.)

The Earth's mantle lies between the crust and core. It is made of crystalline silicates. Although the mantle is solid, it can deform and flow over geological time scale. The motion in the mantle drives the plate tectonics on Earth's surface, which pushes up mountain belts and generates earthquakes. I use numerical model to simulate the flow in the mantle. The flow is governed by the Stokes equation with a distinct thermal-activated, stress-dependent, viscosity. Due to the stress dependence, the Stokes equation becomes nonlinear and is not easy to solved numerically. In this talk, I will present two different numerical approaches to solve the problem and compare their advantages and disadvantages.

