

# Graduate Seminar

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**Thursday, January 15, 2015  
1pm, HH 3017**

## **Fast Solvers for Geodynamic Flows**

**Abstract:**

Computer simulations of fluid flow play an important role in many areas of science and industry, including weather prediction, aerospace design, and geophysical research. In this talk, I will derive the mathematical models that are used in these simulations from basic ideas of conservation and vector calculus. Looking deeper into the models for viscous flows, such as convection within the Earth's mantle, we will see how linear algebra naturally arises in the transition from a mathematical model to a computer simulation. Fast algorithms from numerical linear algebra enable simulations with tens or hundreds of millions of equations and unknowns, which give us better and better insight into the dynamics of the Earth.