



Department of Physics and Astronomy  
SPRING 2026 Colloquium Series

# “A Numerical Modeling Perspective on How Earth’s Surface Deformation is Controlled by Underlying Mantle Dynamics”

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The coupling between a planet’s deep interior and its surface dynamics remains a fundamental problem in Earth and planetary sciences. Because direct observations of the deep interior are limited, numerical models that link slow viscous flow at depth to surface deformation are essential. These models rely on observational constraints from geophysics and mineral physics to infer the physical properties and mechanical behavior of Earth’s interior.

In my work, I develop global and regional numerical models by contributing to the community software ASPECT. These models are designed to accurately represent their present-day physical states, while capturing complexity across vastly different length scales. I evaluate competing physical hypotheses by systematically validating model predictions against surface observations. This work advances our understanding of how surface deformation is governed by the underlying mantle flow, providing key insights into physical mechanisms controlling plate-boundary dynamics and large-scale surface kinematics.

**Thursday, April 2, 2026**

**4:00 - 5:20PM**

**MND1015**

*Open & Free to all students, faculty and public*