

Graduate Student Opportunities in the MSU Geodesy Group

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We're recruiting PhD students to work on a newly funded project that will use spaceborne synthetic aperture radar interferometry (InSAR) along with other geodetic data sets to characterize complex surface deformation that varies in time and space. InSAR techniques allow the detection of small (down to mm level) surface movements, using the phase difference between repeat SAR images. These surface movements can be due to processes ranging from volcanic activity, earthquakes, and longer-term plate motion to changes in surface water loading. We can measure the rates of motion for these processes through the analysis of a long time series of interferograms (the phase difference mentioned above). InSAR time series can be combined with GNSS (Global Navigation Satellite System, of which GPS is one example) time series to determine 1D, 2D, or 3D surface displacements or rates. The exact project will depend on student interests, but our current studies of active tectonics, volcanism, and hydrology focus on areas of complex deformation including Alaska, western Canada, the Caribbean, East Africa, and the Caucasus and Central Asia.

Students will gain experience with data processing and analysis of large geophysical data sets (including data from the newly launched NISAR satellite mission), InSAR time series techniques, the integration of InSAR and GNSS displacement data, and modeling to constrain the sources of deformation while working within a collaborative, multi-institutional project.

Prospective geodesy students should have a strong quantitative background and programming experience (MATLAB, Python) would be very helpful. Prior geodesy experience is not required. Students should have the ability and willingness to fill any knowledge gaps in physics, math, and programming.

If you are interested in a graduate position, please get in touch (we prefer students to contact us for a chat before applying to the department). To receive full consideration for university and college recruitment fellowships, potential PhD students must apply by November 30. More information about the application process can be found here:

<https://ees.natsci.msu.edu/academics/graduate/application.aspx>

For more information about our graduate programs, see the Department of Earth and Environmental sciences website: <https://ees.natsci.msu.edu/academics/graduate/index.aspx>