



## PhD opportunities in Space Geodesy/Seismology

The Division of Marine Geology and Geophysics (MGG) at the Rosenstiel School of Marine and Atmospheric Science (RSMAS) at the University of Miami, Florida, invites applications for 3 PhD positions.

### **Seismic structure and earthquake mechanism in Hawaii**

Hawaii is one of the most seismically active regions in the world and has been serving as a natural laboratory for studying the interactions between seismic and magmatic processes for the past few decades. We invite applications for graduate students leading to the PhD degree. The appointee will apply both traditional and state-of-the-art seismological techniques to study the seismic structure and earthquake mechanism in Mauna Loa and Kilauea volcanoes, Hawaii. One aspect of this work involves investigating near-source in situ velocity structure using high-precision earthquake data. The appointee is also expected to integrate the seismic models with independent models from space geodesy. This project is funded by the National Science Foundation

### **Magmatic systems Indonesian and Philippine volcanoes**

Volcanic eruptions are preceded by the ascent of magma to shallow levels, which causes ground inflation detectable with satellite-based Interferometric Synthetic Aperture Radar (InSAR). The appointee will use a variety of SAR satellites to develop an inventory of deforming volcanoes for Southeast Asia, integrate the deformation data with in-situ data and gas measurements, and use finite element modeling methods to address first-order questions about magma ascent and eruption triggering. The appointee will also support the Indonesian and Philippine volcano monitoring agencies with deformation data during volcanic crises. This project contributes to the Global Earth Observation System of Systems (GEOSS) and is funded by the National Science Foundation.

### **Greenland ice sheet loss from glacial isostatic adjustment (GIA) observations**

Melting of the Greenland ice sheet is a main contributor to global sea level rise. The appointee will use InSAR and GPS observations of bedrock displacements to characterize the response of the crust to unloading by ice loss, integrate geodetic observations with observations from Operation IceBridge, ICESat, Cryosat-2, and GRACE to resolve ice mass loss in space and time, and use coupled ocean-atmosphere-sea-ice simulations to assess the effects of freshwater influx on the evolving climate. This project is funded by NASA.

For more information on our research activities, please visit <http://www.geodesy.miami.edu> and <http://www.rsmas.miami.edu/>. For the geodesy positions please contact Profs. Falk Amelung ([famelung@rsmas.miami.edu](mailto:famelung@rsmas.miami.edu)) and Shimon Wdowinski ([swdowinski@rsmas.miami.edu](mailto:swdowinski@rsmas.miami.edu)) and for the seismology position Prof. Guoqing Lin ([glin@rsmas.miami.edu](mailto:glin@rsmas.miami.edu)). Starting date is January 2015 or earlier. For the formal application procedure please visit the RSMAS Graduate Studies website. International applicants are encouraged to take the GRE and TOEFL tests at their earliest convenience. Review of applications will start in March 2014 and continues until the positions are filled.



*In addition we are seeking funding for the following PhD positions. Potential applicants are requested to contact Profs. Amelung, Wdowinski and Lin for updates about these positions. Some of the positions will be filled by January 2015.*

### **Volcano interaction**

There is increasing evidence that magmatic plumbing systems of neighboring volcanoes are interconnected at depth. The appointee will use InSAR, GPS and seismic observations to study these interconnections. This focus is initially on the Galapagos and the Hawaiian volcanoes and will then be extended to volcanoes in Iceland, Afar and Japan. The project will be supported by a planned seismic and GPS experiment at the Galapagos volcanoes.

### **Geodynamics of the Basin and Range Province.**

About 25% of the relative plate motion between the North-American and the Pacific plates occurs in the Western Basin and Range, yet the driving forces of this deformation are only poorly understood. The appointee will use multi-satellite Interferometric Synthetic Aperture Radar data (InSAR) and continuous GPS data of the Plate Boundary Observatory (PBO) to precisely characterize the present-day crustal deformation, and to develop 3-D numerical models to explain the observations.

### **Satellite-based volcano monitoring in Latin America**

The appointee will use InSAR, GPS, seismic and multi-spectral observations to study volcanoes in the Northern Andes, Central America and Caribbean. In this discovery-based project, InSAR-detected volcanic activity will guide the planning of in-depth studies. In the event of volcanic crises, the appointee will support the local volcano monitoring agencies with InSAR-derived deformation data. This project is part of a disaster risk reduction initiative of the Committee of Earth Observation Satellites, aimed at demonstrating the feasibility of global volcano monitoring ([described here](#)).

### **Space-based wetland hydrology**

Wetland InSAR is a unique application of the InSAR technology providing high spatial resolution hydrological observations of wetland that cannot be obtained by any terrestrial-based method. The appointee will use SAR and InSAR data acquired over the Everglades (south Florida) and Sian Ka'an (Yucatan, Mexico) wetlands to monitor the hydrology of both wetland systems as part of a large hydro-ecology study. This project is funded by the National Aeronautics and Space Administration (NASA).

### **Flank instabilities of basaltic volcanoes**

The flanks of active basaltic volcanoes are unstable and some are slowly moving driven by gravity or magmatic intrusions into the volcanic edifice. The appointee will assemble comprehensive seismic and geodetic data (earthquake relocations, InSAR and GPS) of Mt Etna, Kilauea, and other basaltic volcanoes and use 3-D numerical modeling methods for a comparative study of the mechanics of flank instabilities. This project is supported by data of the Geohazard Supersites and Natural Laboratories Initiative.