PhD Research Assistantships, fall 2015

Two PhD Research Assistantships will be available starting in Fall 2015, one in the Environmental Science and Engineering (ESE) PhD Program and the other in the Mechanical Engineering (Geophysical Fluid Dynamics) PhD Program, both at the Univ. of Texas San Antonio (UTSA), San Antonio TX, USA.

A three year NSF-funded study of Coastal Polynyas and Antarctic sea ice in the Ross Sea will start in early 2015. A vessel expedition to the Ross Sea in April-May 2017 will be made, along with a later airborne campaign obtaining airborne lidar and imagery over the ice cover. The first goal of the project is to study air-ice-ocean interactions in the Ross Sea polynyas and sea ice zone to understand recent expansion of the Antarctic sea ice cover in this region and impacts of ice formation on the formation of Antarctic Bottom Water. An additional goal is to make measurements of ice thicknesses with their coincident surface elevations and snow depths. The purpose of these latter measurements is to establish algorithms with quantitative confidence limits for converting surface elevations into estimates of ice thicknesses. Using these field-established algorithms, interannual variability in regional ice production in the Ross Sea can be estimated through analyses of airborne lidar data and the upcoming IceSAT 2 satellite altimeter mission.

1) The ESE PhD study will primarily focus on analyses of the relevant field data to determine ice thickness from surface elevations followed by analysis of IcePod (NSF C-130) airborne lidar data to estimate ice thicknesses and to relate any observed ice distribution changes to ocean and atmospheric forcing in the Ross Sea. Analyses of other remote sensing data (e.g., MODIS and radar) will be undertaken for ice formation processes in coastal polynyas, ice deformation and ice concentration. Analysis and integration of existing ICESat, CryoSat, and IceBridge data sets will be undertaken for the same area. Interests in sea ice geophysics, polar oceanography and remote sensing with some background in computer science, physics, and earth science is expected for best-qualified applicants. Prior experience on sea ice remote sensing is preferred.

2) The ME (GFD) PhD study will undertake numerical modeling to simulate processes (e.g. air-ice-ocean interaction, conversion of surface waters into high density shelf waters, modeling of density currents that transport high density waters to the deep ocean, and internal fluid flow and convection in sea ice) and also using the field data to identify new processes and to provide model validation. The position requires a Master’s degree or equivalent in Mechanical Engineering, Civil Engineering, or Applied Mathematics. Knowledge of numerical programming, parallel computing and familiarity with programming languages is required. The student should also have some Fluid Dynamics background. A candidate with background in Geophysical Fluid Dynamics is preferred but is not required.

Formal application deadline for the PhD admission is 1 Feb 2015 for admission in Fall semester, 2015. Application information is available on: [http://utsa.edu/admissions/index.html](http://utsa.edu/admissions/index.html). Applications should directly go to the same website.

Interested applicants should contact: Stephen.ackley@utsa.edu, Kiran.bhaganagar@utsa.edu and Hongjie.xie@utsa.edu for questions on qualification, and if more details are needed. More information about the UTSA polar research group can be found at [www.utsa.edu/LRSG](http://www.utsa.edu/LRSG).