PhD Positions in Mathematics or Engineering Departments at the University of Florida for Mathematics Students!

Would you like to be apart of an active and exciting research group at the frontiers of Theoretical and Numerical PDEs, Dimensionality Reduction, Dynamical Systems?

5 Funded Positions are available in Dr. Mohseni’s group

To be considered for a research project you must:
Send a detailed CV to Melanie DeProspero (mel7703@ufl.edu) complete with GPA, courses, publications, developed projects, GRE (if applicable)

Ways to stand out include:
• publications in archived journals and conferences
• special skills (programming, software, hardware, etc.)
• mathematical skills (BS/MS degree in Math, etc.)
Make sure to highlight these in your CV

Apply by December 15th

Here are some of the current positions:

• **PDE Regularizations Technique:** Many PDEs, in particular hyperbolic PDEs, are prone to discontinuity development. A well-utilized technique for regularizing them has been the addition of a Laplacian term to create parabolicity. Here we would like to investigate our recently discovered non-dissipative regularization technique. This position requires strong PDE background. The position could be for someone with a focus on proving existence, uniqueness results or for someone focused on numerical simulation.

• **Nonlinear Dimensionality Reductions.** Many physical and engineering problems have the dimensionality curse. In this effort we focus on evolution equations and we try to develop nonlinear dimensionality reduction techniques that preserve the geometrical structure and dynamical structure of these evolution equations. This research requires strong differential geometry and some numerical PDE background.

• **Computational Fluid Dynamics (CFD): Moving boundary problems including flapping insects or swimming fish.** We are interested to develop new numerical algorithms for simulating PDEs with moving boundary conditions. Requires someone with some CFD coding background and strong numerical PDE background.

• **CFD: Shock-Turbulence Interaction:** This research is focused on solving a nonlinear couple hyperbolic-parabolic PDE, namely the Navier-stokes (or related equations. Requires someone with strong mathematics and programming background and good understanding of compressible flows and turbulence.

• **Geometric Mechanics:** Poincare highlighted the close connections between geometry and mechanics. This project is focused on geometric mechanics and its application in fluid dynamics and control theory. The project requires a strong background in differential geometry, Lie groups, and mechanics.

**GROUP WEBSITE & PUBLICATION:** http://enstrophy.mae.ufl.edu/~mohseni/home/