JOHNS HOPKINS
Center for Environmental & Applied Fluid Mechanics

Weekly CEAFM Seminar: Fall 2012

Date: **Friday, October 5, 2012**

Time: 11:00 AM

Location: Gilman 50 (Marjorie M. Fisher Hall)

Speaker: **Dr. Shawn Shadden** (Illinois Institute of Technology)

Title: **"Cardiovascular Flow: Modeling, Measurement, and Characterization"**

Abstract

Vast evidence suggests that localized disturbances to blood flow are strongly correlated to the localization of cardiovascular diseases. Therefore, proper assessment of blood flow mechanics (hemodynamics) can be essential in understanding vascular disease progression, and evaluating different treatment options. Major obstacles in this area of research include (1) being able to generate accurate patient-based blood flow data, and (2) properly evaluating the data to extract information that is biologically or clinically important. Both of these obstacles are often challenging. We will discuss methods that we use to both measure and model *in vivo* hemodynamics using medical imaging and scientific computing. We will also discuss the application of a computational dynamical systems framework that enables rigorous characterization of unsteady hemodynamics. We will demonstrate how these tools offer unprecedented and valuable perspectives into cardiovascular flow problems, and how this framework is helping to shift the current "shear-centric" view of hemodynamics to a more complete appreciation and understanding of the biomechanical facets of blood flow, while providing the tools needed to make such understandings possible.