

# Department of Applied and Computational Mathematics and Statistics Colloquium

**Martina Bukač**


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will give a lecture entitled:

*Mathematical and computational models of fluid-structure interaction with  
applications to hemodynamics*

## Abstract

Mathematical modeling and numerical simulations have been recognized as important tools for understanding human cardiovascular physiology and pathophysiology. We will discuss mathematical and computational models for the fluid-structure interaction (FSI) between blood flow and arterial walls. We describe the fluid flow by the Navier-Stokes equations for an incompressible viscous fluid, and we consider three cases for the structure problem: thin structure, composite structure, and poroelastic structure. The fluid and structure equations are coupled via the kinematic and dynamic coupling conditions, resulting in a nonlinear, moving boundary, FSI problem. To solve the problem numerically, we propose a partitioned numerical algorithm which is easily applied to the three different cases. We will present stability and convergence results, supported by numerical examples.



**Friday, February 7, 2014  
4:30 p.m. to 5:30 p.m.  
127 Hayes-Healy Center**

Colloquium Tea 4:00 p.m. to 4:30 p.m. 154 Hurley Hall