

**Meeting:** 1006, Lubbock, Texas, SS 16A, Special Session on Partial Differential Equation and Its Application in Biomedical Study

1006-35-184      **Suncica Canic\*** ([canic@math.uh.edu](mailto:canic@math.uh.edu)), Department of Mathematics, 4800 Calhoun Rd, Houston, TX 77204. *A model of blood flow in compliant arteries: modeling, analysis, simulation and experimental verification.*

The speaker will talk about a recently derived model that describes blood flow in medium-to-large human arteries. The model is based on the fluid-structure interaction between the flow described by the incompressible, viscous Navier-Stokes equations and the motion of the vessel wall described by the Navier equations for a linearly elastic membrane. The focus is on reduced, effective models that hold in axially symmetric geometries, determined by vascular prostheses called stents and stent-grafts. The reduced model is of Biot type with memory, providing the explicit form of the viscoelastic nature of the coupled problem. Existence of a unique weak solution to the Biot system is proved. Numerical simulations and experimental validation performed at the mock circulatory loop, assembled at the Texas Heart Institute, will be presented. Future application to optimal prostheses design will be discussed. (Received February 14, 2005)