1106-35-845 **Suncica Canic***, Department of Mathematics, 4800 Calhoun Rd., University of Houston, Houston, TX 77025, and **Boris Muha** and **Martina Bukac**. *Fluid-Composite Structure Interaction.*

Composite materials appear in virtually all areas of engineering and in nature. Examples include engineering structures such as boats and aircrafts, or, in biological applications, blood vessels of major human arteries. These materials are exposed to a wide spectrum of dynamic loads. Understanding the interaction between composite materials and the surrounding fluid is important for prevention of catastrophic events in engineered constructs, or for design of medical treatments in case of biological applications. No mathematical results exist so far that analyze solutions to fluid-structure interaction problems with composite structures.

In this talk we make a first step in this direction by presenting a program to study the **existence and numerical simulation** of solutions for a class of problems describing the interaction between a multi-layered, composite structure, and the flow of an incompressible, viscous fluid, giving rise to a fully coupled, **nonlinear moving boundary, fluid-multi-structure interaction problem.** Our results reveal a new physical regularizing mechanism: inertia of the fluid-structure interface regularizes the evolution of the entire solution. (Received September 07, 2014)