■ **First author** Irena Lasiecka - University of Virginia , Charlottesville, VA 22901,
IBS, Polish Academy of Sciences, Warsaw.

Global existence of solutions to a 3-D fluid structure interactions with moving interface

Equations of fluid structure interactions are described by Navier Stokes equations coupled to a dynamic system of elasticity. The coupling is on a free boundary interface between the two regions. The interface is moving with the velocity of the flow. The resulting model is a quasilinear system with parabolic-hyperbolic coupling acting on a moving boundary. One of the main features and difficulty in handling the problem is a mismatch of regularity between parabolic and hyperbolic dynamics. The existence and uniqueness of smooth local solutions has been established by D. Coutand and S. Shkoller *Arch. Rational Mechanics and Analysis* in 2005. Other local wellposedness results with a decreased amount of necessary smoothness have been proved in a series of papers by I. Kukavica, A. Tuffaha and M. Ziane. The main contribution of the present paper is *global* existence of smooth solutions. This is accomplished by exploiting a natural damping occurring at the interface.

This work is joint with M. Ignatova (Stanford University), I. Kukavica (University of Southern California, Los Angeles) and A. Tuffaha (The Petroleum Institute, Abu Dhabi, UAE)