The geometric rigidity estimate and nonlinear elasticity of thin bodies

Maria Giovanna Mora
SISSA-ISAS, Italy

In this talk we will review the geometric rigidity estimate proved by Friesecke, James, and Mller, and discuss its applications to the rigorous derivation of lower dimensional models for thin elastic bodies.

Inverse Problems for some climate models

Jacques Tort
Université de Toulouse, France

This talk aims at presenting Lipschitz stability results for various inverse problems relative to degenerate parabolic equations. These equations come from a climate model developped by Budyko and Sellers in the sixties. In these joint works with P. Cannarsa, M. Yamamoto, and J. Vancostenoble, we use the method introduced by Imanuvilov and Yamamoto in 1998 and based on Carleman estimates. What is new here is that we study a class of one-dimensional degenerate parabolic equations. In our model, the diffusion coefficient vanishes at least at one extreme point of the domain. Instead of the classical Carleman estimates derived by Fursikov and Imanuvilov for non degenerate equations, we use and extend some recent Carleman estimates for degenerate equations obtained by Cannarsa, Martinez and Vancostenoble.

Asymptotic behavior of massless Dirac waves in Schwarzschild geometry

Chunjing Xie
University of Michigan, USA

Abstract: we show that massless Dirac waves in the Schwarzschild geometry decay to zero at a rate $t^{-2\lambda}$, where $\lambda = 1, 2, \cdots$ is the angular momentum. Our technique is to use Chandrasekhar's separation of variables whereby the Dirac equations split into two sets of wave equations. The proof of asymptotic behavior for the solutions of these wave equations relies on careful analysis of the Green's functions for time independent Schrödinger equations associated with these wave equations even though they have bounded zero energy solutions. This is a joint work with Joel Smoller.