THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Analysis and PDE Seminar

August 24, 2022
3:00 - 4:00 p.m.
PH 385

A Friedland-Hayman inequality and two-phase free boundary problems

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Abstract. The Friedland-Hayman inequality provides a lower bound on the first Dirichlet eigenvalues of complementary subsets of the sphere. In this talk, we will discuss a variant of this inequality for convex subsets of the sphere, with mixed Dirichlet-Neumann boundary conditions. The proof of this inequality, together with the case of equality, uses a version of Caffarelli's contraction theorem for the Brenier optimal transport mapping. We will then show how this inequality appears in the boundary regularity theory of a two-phase free boundary problem in a convex domain. This is joint work with David Jerison and Sarah Raynor.