Stability of isoperimetric eigenvalue inequalities

Mikhail Karpukhin

California Institute of Technology

June 7, 2021

Stability questions for sharp inequalities are important problems in analysis. Recently, these questions have been investigated for the first eigenvalue of the Laplacian on Euclidean domains. Optimal stability estimates for Faber-Krahn and Szego-Weinberger inequalities were obtained by Brasco-De Philippis-Velichkov and Nadirashvili, Brasco-Pratelli respectively. In the present talk we first consider the stability of another fundamental inequality in spectral geometry: Hersch inequality for the first eigenvalue on the 2-dimensional sphere. We then present generalizations to other surfaces and the related problems from harmonic maps and minimal surfaces. Finally, if time permits, potential applications to Steklov eigenvalue problem will be discussed. Based on the joint work with M. Nahon, I. Polterovich and D. Stern.