1153-58-212 **Mikhail Karpukhin*** (mkarpukh@uci.edu), 340 Rowland Hall (Bldg.# 400), University of California, Irvine, Irvine, CA 92697-3875. *Eigenvalues of the Laplacian and minimal surfaces in spheres.*

The study of upper bounds for Laplacian eigenvalues on surfaces is a classical problem of spectral geometry going back to J. Hersch, P. Li and S.-T. Yau. It has many interesting to differential geometry, for example, the sharp isoperimetric inequalities for Laplacian eigenvalues are closely related to minimal surfaces in spheres.

In the present talk we survey recent advances on isoperimetric eigenvalue inequalities and present an "area index" approach to the problem. In particular, we discuss the interplay between area index and Laplacian eigenvalues, and present some applications, including a new bound on the index of minimal spheres as well as the sharp isoperimetric inequality for all Laplacian eigenvalues on the projective plane. (Received August 28, 2019)