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Iosif Polterovich* (iossif@dms.umontreal.ca), Department of Mathematics and Statistics, University of Montreal, 2920 Chemin de la Tour, Montreal, Quebec H3T 1J8, Canada. *Sharp upper bounds for the first eigenvalue on surfaces and mixed isospectrality.*

Estimating the first eigenvalue of the Laplacian under different geometric assumptions is a classical problem in spectral geometry. For instance, the first eigenvalue on a surface can be bounded from above in terms of the area only. However, sharp upper bounds for the first eigenvalue on surfaces of a given area are quite difficult to obtain. The talk focuses on this question and its links to a seemingly unrelated topic: isospectrality for domains with mixed boundary conditions. (Received February 09, 2006)