LAPLACE EIGENFUNCTIONS ON SURFACES

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The course will be mostly self-contained.

RECOMMENDED READINGS (context & details)

- Chavel, Eigenvalues in Riemannian Geometry, Pure and Applied Mathematics, 115. Academic Press, Inc., Orlando, FL, 1984. **Chapters 1-2**.
- Chouli, Applications of elliptic Carleman inequalities to Cauchy and inverse problems, SpringerBriefs in Mathematics. BCAM SpringerBriefs. Springer, 2016. **Chapters 1-2**
- Astala, Iwaniec, Martin, Elliptic partial differential equations and quasiconformal mappings in the plane. Princeton Mathematical Series, 48. Princeton University Press, Princeton, NJ, 2009. **Chapters 1-3**

REFERENCES (results to be presented appear in these papers)

- H. Donnelly, and C. Fefferman "Nodal sets for eigenfunctions of the Laplacian on surfaces", J. Amer. Math. Soc. 3 (1990), no. 2, 333–353.
- R.-T. Dong, "Nodal sets of eigenfunctions on Riemann surfaces", J. Differential Geom. 36:2 (1992), 493–506.
- F. Nazarov, L. Polterovich, and M. Sodin, "Sign and area in nodal geometry of Laplace eigenfunctions", Amer. J. Math. 127:4 (2005), 879–910.
- G. Roy-Fortin, "Nodal sets and growth exponents of Laplace eigenfunctions on surfaces", Anal. PDE 8 (2015), no. 1, 223–255.
- A.Logunov, and E. Malinnikova, "Nodal sets of Laplace eigenfunctions: estimates of the Hausdorff measure in dimensions two and three." 50 years with Hardy spaces, 333–344, Oper. Theory Adv. Appl., 261, Birkhäuser/Springer, Cham, 2018.
- I. Polterocich, L. Polterovich, and V. Stojisavljevic, "Persistence barcodes and Laplace eigenfunctions on surfaces." Geom. Dedicata 201 (2019), 111–138.
- S. Steinnerberger, "A metric Sturm-Liouville theory in two dimensions." Calc. Var. Partial Differential Equations 59 (2020), no. 1, Paper No. 12, 14 pp.