Applications of harmonic map theory to eigenvalue inequalities

Abstract:
The Laplacian is a canonical second order elliptic operator defined on any Riemannian manifold. The study of upper bounds for its eigenvalues under the volume constraint is a classical problem of spectral geometry going back to J. Hersch, P. Li and S.-T. Yau. The particular interest to this problem stems from a surprising connection to the theory of harmonic maps to spheres. In the present talk we will survey some recent results in the area with an emphasis on the role played by the energy index of harmonic maps. In particular, we will discuss some recent applications, including a min-max proof of the existence of optimisers and an optimal upper bound for Laplacian eigenvalues on the projective plane.

Host: Lei Ni

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