

Oberwolfach Seminar: Spectral estimates on noncompact manifolds and applications to geometry

Date: May 20th - 26th, 2018

Organizers: Nadine Große, Universität Freiburg
Luciano Mari, Scuola Normale Superiore, Pisa
Ben Sharp, University of Leeds

Programme overview:

- Basics: Laplace, Schrödinger and Dirac operators with special focus on noncompact manifolds, Geometry of submanifolds and immersions, Introduction to the spectral theory of compact minimal hypersurfaces
- Techniques to study the spectrum on noncompact manifolds: Rayleigh-Ritz and min-max, Radialization, Heat kernels and Green functions, decay estimates for embedded eigenvalues, Conditions for discreteness of spectra/ half lines in the essential spectra/ existence of spectral gaps
- Applications: Geometric implications to immersions/submanifold theory: index estimates and harmonic forms, spectral stability and topology of manifolds, Weak compactness of closed minimal hypersurfaces under spectral bounds, (Non-)existence results for geometric semilinear PDEs, e.g. Yamabe-type equations.

Introductory reading:

Some spectral theory:

Chapter 3 in
Pigola S., Rigoli M. and Setti A., Vanishing and Finiteness Results in Geometric Analysis, Progress in Math. 266, 2008

Deadline for applications: March 19, 2018 (to seminars@mfo.de)