

谱几何在线讨论班 I

时间：2020 年 11 月 25 日（星期三）

上午 8:30-11:30,下午 2:00-5:00

腾讯会议 ID : 458 508 375

主办单位：复旦大学

报告人：

陈 化 武汉大学

韦国芳 华东师范大学

陆志勤 UC Irvine

吴云辉 清华大学

余成杰 汕头大学

王为为 清华大学

11 月 25 日(周三)	
上午 8:30-9:20	陈化
9:40-10:30	韦国芳
10:40-11:30	陆志勤
下午 2:00-2:50	吴云辉
3:10-4:00	余成杰
4:10-5:00	王为为

报告题目: Estimates of Dirichlet Eigenvalues for Fractional Laplacian

报告人: 陈化

报告摘要:

Let $\Omega \subset \mathbb{R}^n$ ($n \geq 2$) be a bounded domain with smooth boundary $\partial\Omega$. In this talk, we shall study the Dirichlet eigenvalue problem of the fractional Laplacian $(-\Delta)^s$ which restricted to Ω with $0 < s < 1$. Denote by λ_k the k^{th} Dirichlet eigenvalue of $(-\Delta)^s$ on Ω . Firstly, we establish the explicit upper bound estimates of the ratio $\frac{\lambda_{k+1}}{\lambda_k}$, which have polynomially growth in k with optimal increase orders. Secondly, we also give the explicit lower bounds for the Riesz mean function $R_\sigma(z) = \sum_k (z - \lambda_k)_+^\sigma$ with $\sigma \geq 1$.

报告题目: Fundamental Gap Estimate for Convex Domains

报告人: 韦国芳

报告摘要:

In their celebrated work, B. Andrews and J. Clutterbuck proved the fundamental gap conjecture that difference of first two eigenvalues of the Laplacian with Dirichlet boundary condition on convex domain with diameter D in the Euclidean space is greater than or equal to $3\pi^2/D^2$. In several joint works with X. Dai, Z. He, S. Seto, L. Wang (in various subsets), the estimate is generalized, showing the same lower bound holds for convex domains in the unit sphere. In sharp contrast, in recent joint work with T. Bourni, J. Clutterbuck, A. Stancu, X. Nguyen and V. Wheeler, we prove that the product of the fundamental gap with the square of the diameter can be arbitrarily small for convex domains of any diameter in the hyperbolic space.

报告题目: The Spectrum of the Laplacian on forms over open manifolds

报告人: 陆志勤

报告摘要:

In this talk, we present the proof of the following theorem: let M be a complete non-compact Riemannian manifold whose curvature goes to zero at infinity, then its spectrum of the Laplacian on differential forms is a connected set. The result under different special cases was obtained before, but we recently prove the full general case. This is joint with Nelia Charalambous.

报告题目: Optimal lower bounds for first eigenvalues of Riemann surfaces for large genus

报告人: 吴云辉

报告摘要:

In this article we study the first eigenvalues of closed hyperbolic surfaces for large genus. We show that for every closed hyperbolic surface X_g of genus g ($g \geq 2$), the first eigenvalue of X_g is greater than $\frac{L_1(X_g)}{g^2}$ up to a uniform positive constant multiplication. Where $L_1(X_g)$ is the shortest length of simple closed multi-geodesics separating X_g . Moreover, we also show that this new lower bound is optimal as $g \rightarrow \infty$. This is a joint work with Yuhao Xue.

报告题目: Comparison of Eigenvalues and Lichnerowicz Estimates on Graphs

报告人: 余成杰

报告摘要:

In this talk, some recent works on comparison of Steklov eigenvalues, Dirichlet eigenvalues, Neumann eigenvalues and Laplacian eigenvalues and their applications in obtaining Lichnerowicz estimates for Steklov eigenvalues, Dirichlet eigenvalues, Neumann eigenvalues on graphs will be presented. We will also discuss the rigidity of the estimates.

报告题目: On the multiplicity of the eigenvalues in unit disk and annulus.

报告人: 王为为

报告摘要:

In this talk, we will give a brief review of the multiplicity of the eigenvalues in the unit disk, and present some of our results on annulus.