

Elliptic Operators and Beyond

会议手册

会议信息

会议时间：2026 年 6 月 27 日

会议地点：上海交通大学理科楼 6 号 706

主办单位：上海交通大学数学科学学院

会议组织：王芳（SJTU）、张若冰（UCSD）

会议日程

时间	报告人	题目
09:00-09:40	韩青	Global and Exterior Solutions to the Minimal Surface Equation
09:40-10:00	茶歇	
10:00-10:40	林龙智	Energy Convexity for Harmonic and Biharmonic Maps and H-Surfaces
10:40-11:00	茶歇	
11:00-11:40	楚健春	The rigidity of dimension estimate for holomorphic functions on Kahler manifolds
12:00-14:00	午餐	
14:00-14:40	韩飞	Almost Flat Manifolds and Index Theorem
14:40-15:00	茶歇	
15:00-15:40	钱信	Structure of Metric Measure Spaces with Mixed Synthetic Curvature Bounds
15:40-16:00	茶歇	
16:00-17:40	Free Discusstion	
18:00-20:00	晚餐	

题目摘要

韩青 (University of Notre Dame)

Title: Global and Exterior Solutions to the Minimal Surface Equation

Abstract: A characterization of global solutions to the minimal surface equation has been known by the efforts of Bernstein (1914), De Giorgi (1965), Almgren (1966), Simons (1968), and Bombieri, De Giorgi, and Giusti (1969). In this talk, we first review relevant results. Then, we switch to exterior solutions and aim to present a complete characterization of solutions to the minimal surface equation near infinity. It is well-known that Dirichlet boundary value problems in exterior domains do not always admit solutions. We demonstrate that prescribing asymptotic behaviors forms a new type of problems leading to all solutions near infinity. The harmonic functions determining the asymptotic behaviors play the role of “free data” as the boundary values in the boundary value problems.

林龙智 (University of California, Santa Cruz)

Title: Energy Convexity for Harmonic and Biharmonic Maps and H-Surfaces

Abstract: In this talk, we review energy convexity results for weakly harmonic and biharmonic maps, which play a key role in the min-max construction of harmonic 2-spheres and biharmonic 4-spheres via the Schwarz alternating method. We then present a convexity property of the energy functional associated with surfaces of prescribed mean curvature (H-surfaces) in $\mathbb{R}^3$ under Dirichlet boundary conditions, yielding quantitative uniqueness. We also discuss energy convexity along the corresponding heat flows which leads to uniform convergence of the flows to their stationary solutions.

楚健春 (Peking University)

Title: The rigidity of dimension estimate for holomorphic functions on Kahler manifolds

Abstract: In this talk, we will discuss the optimal rigidity of dimension estimate for holomorphic functions with polynomial growth on Kahler manifolds with non-negative holomorphic bisectional curvature. There is a specific gap between the largest and the second largest dimension. We also determine the optimal dimension that ensures the maximal volume growth which implies the manifold is biholomorphic to the complex Euclidean space. This is a joint work with Jie Deng, Zihang Hao and Jian Li.

韩飞 (National University of Singapore)

Title: Almost Flat Manifolds and Index Theorem

Abstract: In this talk, I will give a brief introduction to almost flat manifolds and their basic geometric and topological features. I will then discuss a conjecture of Farrell–Zdravkovska and S. T. Yau asserting that compact almost flat manifolds should necessarily arise as boundaries. Finally, I will explain how one can bring Wu classes together with the Atiyah–Singer Index Theorem to study this question.

钱信 (University of Jyväskylä)

Title: Structure of Metric Measure Spaces with Mixed Synthetic Curvature Bounds

Abstract: Metric measure spaces satisfying both the $RCD(K,N)$ and $CBA(k)$ conditions provide a natural synthetic framework for spaces with a lower Ricci curvature bound and an upper sectional curvature bound. A foundational result by Kapovitch, Kell, and Ketterer established that a space satisfying these two synthetic curvature bounds simultaneously is a smooth manifold equipped with a possibly non-smooth Riemannian metric. In this talk, we further investigate the geometric and topological structure of such $RCD+CBA$ spaces. Our main results include analogues of the Heintze–Margulis theorem, Cheeger's injectivity radius estimates, and diffeomorphism finiteness theorems. Finally, we discuss collapsing phenomena, notably establishing a fibration theorem in the almost non-positively curved case. This talk is based on joint work with Ruobing Zhang.