

调和专题研讨会

2023年07月10-12日

会议地点：哈尔滨工业大学一校区明德楼B区201-1学术报告厅

会议链接：

<https://us02web.zoom.us/j/86434375863?pwd=WlhpdGdLa0xFanl2U0NlLzdKUGM2UT09>

Zoom ID: 864 3437 5863

Passcode: 049509

邀请报告专家：

曹明明 西班牙国家科学院 数学科学研究所

高传伟 首都师范大学

贺丹青 复旦大学

李文娟 西北工业大学

刘博辰 南方科技大学

王 亮 武汉大学

伍火熊 厦门大学

席亚昆 浙江大学

杨志鹏 云南师范大学

主办单位：哈尔滨工业大学数学研究院

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会议日程

07月9日下午报到

07月10日

主持人：洪桂祥	
08:50—09:00	会议开幕 许全华教授致辞
09:00—09:50	From Fourier expansions to rough singular integrals 伍火熊（厦门大学）
10:00—10:50	短课 1 Alex Iosevich（University of Rochester）
11:00—11:50	短课 2 Alex Iosevich（University of Rochester）

午餐：西苑宾馆 12:00

主持人：伍火熊	
14:30—15:20	L^p -estimates of projections, analytic interpolation, and applications 刘博辰（南方科技大学）
15:30—16:00 休息	
16:00—16:50	Some progress of maximal functions associated with manifolds 李文娟（西北工业大学）
17:00—17:50	Harmonic analysis on 2-step nilpotent Lie groups 杨志鹏（云南师范大学）

会议晚宴： 18:30

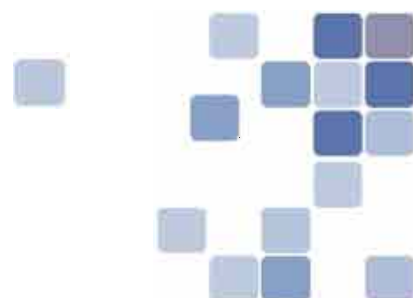
07 月 11 日

主持人：杨东勇

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09:00—09:50	Can you hear your location on a manifold? 席亚昆（浙江大学）
10:00—10:50	短课 3 Alex Iosevich（University of Rochester）
11:00—11:50	短课 4 Alex Iosevich（University of Rochester）

午餐：西苑宾馆 12:00

下午：自由活动



07 月 12 日

主持人：赖旭东

09:00—9:50	Local smoothing estimate for the half-wave operator 高传伟（首都师范大学）
10:00—10:50	短课 5 Alex Iosevich（University of Rochester）
11:00—11:50	短课 6 Alex Iosevich（University of Rochester）

午餐：西苑宾馆 12:00

主持人：翟羽佳

14:30—15:20	Multilinear multiparameter Hörmander multipliers 贺丹青（复旦大学）
15:30—16:00 休息	
16:00—16:50	The multilinear theory and applications 曹明明（西班牙国家科学院 数学科学研究所）
17:00—17:50	A local smoothing estimate on quantum Euclidean space 王亮（武汉大学）

短课题目与简介

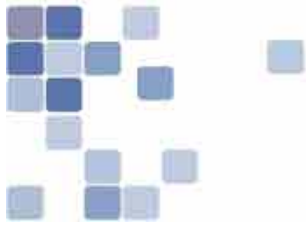
An introduction to the study of finite point configurations

Alex Iosevich

University of Rochester

简介： The basic question we are going to ask is, how large does the Hausdorff dimension of a compact subset of R^d need to be to ensure that it contains vertices of a given point configuration, like a chain, a tree, or an equilateral simplex. These problems are related to the celebrated Falconer distance conjecture, where tremendous progress has been achieved in recent years using decoupling theory, and also to the study of point configurations in subsets of Euclidean space of positive upper Lebesgue density using ergodic methods initiated by Furstenberg, Katznelson and Weiss. In these lectures, we are going to develop a solid foundation for the study of these problems. Discrete example in vector spaces over finite fields will be used to provide the audience with the means of testing their hypotheses in a less technical setting quickly and efficiently.





报告题目与摘要

From Fourier expansions to rough singular integrals

伍火熊

厦门大学

摘要: In this talk, I'll introduce the classical theory of Fourier analysis as well as the related results for singular integrals with rough kernels, including certain recent works and several interesting open problems.

L^p -estimates of projections, analytic interpolation, and applications

刘博辰

南方科技大学

摘要: We obtain new L^p –estimates as well as geometric results on projections. In the proof we introduce a new quantity called s-amplitude, and interpolate analytically not only on p , but also on dimensions of measures. This mechanism provides new perspectives on operators with measures, thus has its own interest.

Some progress of maximal functions associated with manifolds

李文娟

西北工业大学

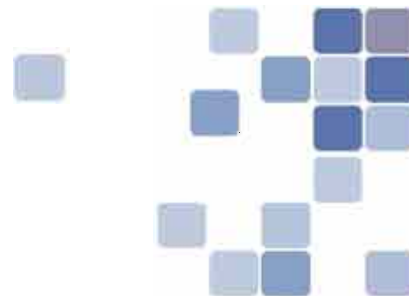
摘要: I will talk about the boundedness of some maximal functions associated with manifolds, such as curves, hypersurfaces etc. The ingredients impact on the bounded index include: type of dilation family (single parameter or not, isotropic dilation or not), dilation set (positive axis, compact interval or fractal set), submanifold (homogeneity or not, through the origin or not, non-vanishing Gaussian curvature or not, codimension 1 or more), measure (weighted measure or not, fractal measure or not).

Harmonic analysis on 2-step nilpotent Lie groups

杨志鹏

云南师范大学

摘要: I will present some basic analysis results on 2-step nilpotent Lie groups G . In particular, based on explicit knowledge of the irreducible unitary representation of G , I will perform a Fourier analysis of the sub-Laplacian and give a closed formula for the heat kernel of the sub-Laplacian on G .





Can you hear your location on a manifold?

席亚昆

浙江大学

摘要: We introduce a variation on Kac's question, "Can one hear the shape of a drum?" Instead of trying to identify a compact manifold and its metric via its Laplace-Beltrami spectrum, we ask if it is possible to uniquely identify a point x on the manifold, up to symmetry, from its pointwise Weyl counting function. This problem has a physical interpretation. You are placed at an arbitrary location in a familiar room with your eyes closed. Can you identify your location in the room by clapping your hands once and listening to the resulting echos and reverberations?

Our main result provides an affirmative answer to this question for a generic class of metrics.

Local smoothing estimate for the half-wave operator

高传伟

首都师范大学

摘要: Local smoothing estimate is an important tool in PDEs which also has close relations with other problems in harmonic analysis, geometric measure theory. In this talk, we will report the local smoothing estimate for the half-wave operator both in the Euclidean and Riemannian settings.

Multilinear multiparameter Hörmander multipliers

贺丹青

复旦大学

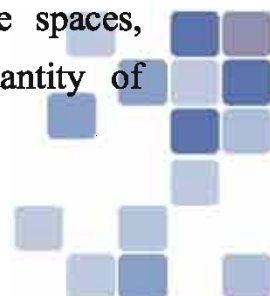
摘要: The multilinear Hörmander multipliers, a natural generalization of the famous Coifman-Meyer multipliers, have been studied extensively recently. In this talk, we present a sharp new result on multilinear multiparameter Hörmander multipliers, which is even new in the one-parameter setting. This is joint work with J.Chen, G.Lu, B.Park, and L.Zhang.

The multilinear theory and applications

曹明明

西班牙国家科学院 数学科学研究所

摘要: In recent years, dyadic analysis has attracted a lot of attention due to the A_2 conjecture. It has been well understood that in the Euclidean setting, Calderón-Zygmund operators can be pointwise controlled by a finite number of dyadic operators with a very simple structure, which leads to some significant weak and strong type inequalities. Similar results hold for Hardy-Littlewood maximal operators and Littlewood-Paley square operators. These owe to good dyadic structure of Euclidean spaces. Therefore, it is natural to wonder whether we could work in general measure spaces and find a universal framework to include these operators. In this talk, we develop a comprehensive weighted theory for a class of Banach-valued multilinear bounded oscillation operators on measure spaces, which merges multilinear Calderón-Zygmund operators with a quantity of operators beyond the multilinear Calderón-Zygmund theory.





A local smoothing estimate on quantum Euclidean space

王亮

武汉大学

简介： In this talk, we will review some developments on the local smoothing conjecture in Euclidean space. Then we will introduce a local smoothing estimate on quantum Euclidean space based on an operator-valued local smoothing estimate. This is a joint work with G.Hong and X.Lai.

参会人员

(按姓名拼音排序)

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