

南大-上海交大几何分析研讨会

Department of Mathematics & IMS, Nanjing University

2023 年 10 月 20 日 – 10 月 23 日

一、会议时间与地点：

- 2023 年 10 月 20 日，参会人员直接去酒店办理入住。
- 2023 年 10 月 21 日-10 月 22 日上午，会议学术报告；10 月 22 日下午，自由讨论。
- 2023 年 10 月 23 日，离会。

会议地点：南京大学鼓楼校区（汉口路 22 号）数学系西大楼 108 室。

二、住宿与交通：

住宿：南京市中山路 251 号，新纪元大酒店。

交通方式：

- 飞机抵达。南京禄口机场离新纪元大酒店约 43 公里，1 小时车程，打车费超过 200 元。也可以地铁前往酒店：禄口机场站乘坐地铁 S1 号线至南京南站，换乘地铁 1 号线至珠江路站（1 号口或 3 号口出站），步行 350 米抵达新纪元大酒店，全程约 1.5 小时。
- 高铁抵达。绝大多数高铁会抵达南京南站，建议地铁前往酒店：南京南站乘坐地铁 1 号线至珠江路站（1 号口或 3 号口出站），步行 350 米抵达酒店，全程约半小时，若坐出租车前往也需要半小时，堵车风险较高。
- 火车抵达。少数高铁、动车会抵达南京站，建议地铁前往酒店：南京站乘坐地铁 1 号线至珠江路站（1 号口或 3 号口出站），步行 350 米抵达酒店，全程约 25 分钟，若坐出租车前往需要 20 分钟左右，遇高峰期有堵车风险。

三、报告日程安排：

	10 月 21 日	10 月 22 日
8:10-9:00	葛 剑	袁 伟
9:00-9:50	王嘉项	张世红
9:50-10:10	茶歇	茶歇
10:10-11:00	李沁峰	孙黎明
11:00-11:50	单宇飞	蔡笑寒
12:00-14:00	午餐	午餐
14:00-14:50	陈传强	自由讨论
14:50-15:40	王 博	
15:40-16:00	茶歇	
16:00-16:50	王 杰	
16:50-17:40	李明翔	晚餐
18:00-	晚餐	

四、报告题目与摘要：(按姓氏拼音排序)

- (1) 蔡笑寒 (上海交通大学)

Title: Liouville equations on complete surfaces with nonnegative Gauss curvature

Abstract: We study finite total curvature solutions of the Liouville equation $\Delta u + e^{2u} = 0$ on a complete surface (M, g) with nonnegative Gauss curvature. It turns out that the asymptotic behavior of the solution separates two extremal cases: on the one end, if the solution decays not too fast, then (M, g) must be isometric to the Euclidean plane; on the other end, if (M, g) is isometric to the flat cylinder $\mathbb{S}^1 \times \mathbb{R}$, then solutions must decay linearly and are completely classified.

- (2) 陈传强 (宁波大学)

Title: The L^p Minkowski type problems for a class of mixed Hessian type operators

Abstract: In this talk, we introduce some mixed Hessian type operators and some works about the corresponding Minkowski type problems, which are joint works with Lu Xu.

- (3) 葛剑 (北京师范大学)

Title: 几乎非负曲率流形

Abstract: 我们将概要地介绍曲率有下界流形的经典结果, 以及我们在寻找几乎非负曲率流形拓扑障碍方向的一些新的发现, 这部分内容是基于与陈小杨以及韩飞的合作工作。

- (4) 李明翔 (南京大学)

Title: Higher order Bol's inequality and its applications

Abstract: In this talk, we will introduce a geometric inequality involved with Q -curvature and related rigidity theorems. In particular, we apply such inequality to study the existence of the solutions to some conformally invariant equations as well as the symmetry of such solutions. This is a joint work with Professor Juncheng Wei.

- (5) 李沁峰 (湖南大学)

Title: On the planar Liouville equation

Abstract: In this talk, I will show some geometric results on solutions and supersolutions to the planar Liouville equation. Particularly I will focus on rigidity results and diametric properties of conformal planes with various geometric assumptions. The talk is based on joint works with Alexandre Eremenko, Changfeng Gui and Lu Xu.

- (6) 单宇飞 (上海交通大学)

Title: Normalized Ricci flows on asymptotically hyperbolic manifolds

Abstract: In this talk, I will investigate the behavior of the normalized Ricci flow on asymptotically hyperbolic manifolds. My focus will primarily revolve around the result in the paper authored by Jie Qing, Yuguang Shi and Jie Wu, which can be accessed through this link: ([arXiv:1106.0372](https://arxiv.org/abs/1106.0372)). Subsequently, I would like to briefly introduce some ideas that could potentially enhance their result, ultimately leading to a comprehensive recovery of the perturbation existence result of conformally compact Einstein manifolds initially established by J. Lee and C.R. Graham.

- (7) 孙黎明 (中国科学院数学与系统科学研究院)

Title: A slow blowup solution for the four dimensional semi linear heat equation

Abstract: In this talk, I will discuss our recent construction of a slow blowup solution for the energy critical semi linear heat equations on dimension four. Our work generalizes the result of Schweyer on such equation and confirm the formal matching analysis of Filippas et al. Our method is inspired by the Raphael and Schweyer's work on the quantized slow blowup harmonic maps. This work is joint with Tongtong Li and Shumao Wang.

- (8) 王博 (北京理工大学)

Title: Exterior Dirichlet problem of Hessian quotient equations

Abstract: In this talk, I will present some recent result on the existence of Dirichlet problem of Hessian quotient equations in exterior domains. This is a joint work with Jiguang Bao and Limei Dai.

- (9) 王嘉项 (南开大学)

Title: Sobolev inequalities and regularity of the linearized complex Monge-Ampère and Hessian equations

Abstract: In this talk, we will discuss the regularity of solution to the linearized complex Monge-Ampère and Hessian equations when the complex k -Hessian $H_k[u]$ of u is bounded from above and below. We first establish some estimates of Green's functions associated to the linearized equations. Then we prove a class of new Sobolev inequalities. With these inequalities, we use Moser's iteration to investigate the a priori estimates of Hessian equations and their linearized equations, as well as the Kähler scalar curvature equation. In particular, we obtain the Harnack inequality for the linearized complex Monge-Ampère and Hessian equations under an extra integrability condition on the coefficients. This is a joint work with Bin Zhou.

- (10) 王杰 (中国科学技术大学)

Title: Rigidity and ε -regularity theorems of Ricci shrinkers

Abstract: In this talk, I will introduce some recent results about the rigidity and ε -regularity theorems of Ricci shrinkers. First we prove the rigidity of the asymptotic volume ratio and local volume around a base point of a non-compact Ricci shrinker. Next we obtain some ε -regularity theorems of local entropy and curvature, which improve the previous corresponding results essentially and use them to study the structure of Ricci shrinkers at infinity. Especially, if the curvature of a non-compact Ricci shrinker satisfies some natural integral conditions, then it is asymptotic to a cone. This is a joint work with Professor Youde Wang.

- (11) 袁伟 (中山大学)

Title: Curved Versions of the Ovsienko-Redou Operators

Abstract: In the study of conformal geometry, it is fundamental understand the conformal invariant operators involves in various of problems. For example, the well-known conformal Laplacian plays a key role in the study of Yamabe problem. Inspired by the construction of GJMS operators, we completely classify the tangential bidifferential operators on the ambient space and gives a curved analogue of the classification, due to Ovsienko-Redou and Clerc, of conformally invariant bidifferential operators on the sphere. This is a joint work with Jeffrey S. Case from Penn State University and Yueh-Ju Lin from Wichita State University.

- (12) 张世红 (南京大学)

Title: Constrained Moser-Trudinger-Onofri inequalities and mean field equation

Abstract: We establish Moser-Trudinger-Onofri inequalities under constraint of a deviation of the second order moments from 0, which serves as an intermediate case between Chang-Hang's inequalities under first and second order moments constraints. A threshold for the deviation is a uniqueness criterion for the mean field equation when the constant in the equation is close to $\frac{1}{2}$.