

# Winter Workshop on Geometric Analysis

Department of Mathematics & IMS, Nanjing University

2018 年 11 月 16 - 11 月 19 日

## 一、会议时间与地点:

- 2018 年 11 月 16 日, 参会人员直接去酒店入住。
- 2018 年 11 月 17 日-18 日, 会议学术报告。
- 2018 年 11 月 19 日, 离会。

会议地点: 南京大学鼓楼校区现代数学研究所蒙民伟楼 11 楼 1105 室。

## 二、住宿与交通:

住宿: 南京市中山路 251 号, 新纪元大酒店 B 座

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, 打车约 180 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, 若打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, 若打车前往需要 20 分钟左右, 遇高峰期有堵车风险。

## 三、报告日程:

	17 日	18 日
9:00-9:50	李皓昭	袁伟
10:00-10:50	江文帅	陈传强
10:50-11:10	茶歇	茶歇
11:10-12:00	张永兵	王枫
12:00-14:00	午餐	午餐
14:00-14:50	宋 翀	自由讨论
15:00-15:50	孙 伟	
15:50-16:10	茶歇	
16:10-17:00	张世金	
17:10-18:00	周恒宇	
18:30-	晚餐	晚餐

四、报告题目与摘要：(按姓氏拼音排序)

- (1) 陈传强 (浙江工业大学)

**Title:** Smooth solutions to the  $L_p$ -Dual Minkowski problem

**Abstract:** In this talk, we consider the  $L_p$ -dual Minkowski problem. By studying the a priori estimates and curvature flows, we establish the existence theorem of the smooth solutions. This is a joint work with Yong Huang, and Yiming Zhao.

- (2) 李皓昭 (中国科学技术大学)

**Title:** On the multiplicity-one conjecture for mean curvature flow

**Abstract:** In this talk, I will give some progress on Ilmanen's multiplicity-one conjecture for closed smooth embedded mean curvature flow with type I mean curvature. This is joint work with Bing Wang.

- (3) 江文帅 (浙江大学)

**Title:**  $\epsilon$ -regularity for shrinking Ricci soliton and Ricci flow

**Abstract:** In this talk, we will consider the regularity of shrinking Ricci soliton and Ricci flow without any volume assumption. In dimensional four, we can prove some epsilon regularity for shrinking Ricci soliton and Ricci flow, which generalizes Cheeger-Tian's result to these settings. In higher dimension, we can construct examples to show that similar regularity cannot hold. This is a joint work with Huabin Ge.

- (4) 宋翀 (厦门大学)

**Title:** Singularity of Yang-Mills-Higgs fields on surfaces

**Abstract:** The Yang-Mills-Higgs fields are critical points of the famous Yang-Mills-Higgs functional which plays a fundamental role in quantum field theories. It is known that the isolated singularities of two dimensional YMH fields are in general not removable. In this talk, we will give a sharp estimate of the singular YMH fields, namely, we establish a precise relation between the order of singularity and the limiting holonomy around that point. This is a recent joint work with Bo Chen.

- (5) 孙伟 (上海科技大学)

**Title:** The parabolic flows for complex quotient equations

**Abstract:** The parabolic flow method can be applied to solving complex quotient equations on closed Kahler manifolds. As a result, we solve the complex quotient equations.

- (6) 王枫 (浙江大学)

**Title:** Existence of Kähler-Einstein metrics on a class of singular varieties

**Abstract:** For Fano manifolds, Yau-Tian-Donaldson conjecture asserts the equivalence between the existence of Kähler-Einstein metric and K-polystability. This has been solved by Tian and Chen-Donaldson-Sun independently. In this talk, I will talk about the existence of Kähler-Einstein metrics on a class of singular varieties. This is a joint work of Professor Gang Tian and Chi Li.

- (7) 袁伟 (中山大学)

**Title:** Volume comparison with respect to scalar curvature

**Abstract:** In Riemannian geometry, volume comparison theorem is one of the most fundamental results. The classic results concern volume comparison involving restrictions on Ricci curvature. In this talk, we will investigate the volume comparison with respect to scalar curvature. In particular, we show that one can only expect such results for small geodesic balls of metrics near V-static metrics. As for global results, we give volume comparison for metrics near Einstein metrics with certain restrictions. As applications, we give a partial answer to Schoen's conjecture about hyperbolic manifolds, which recovers a result due to Besson-Courtois-Gallot with a different approach.

We also provide a partial answer to a conjecture proposed by Bray concerning the positive scalar curvature case.

(8) 张世金 (北京航空航天大学)

**Title:** Gradient Kähler-Ricci solitons with nonnegative orthogonal bisectional curvature

**Abstract:** In this talk, I first recall Munteanu and Wang's result: any complete Ricci shrinker with positive sectional curvature must be compact, and the outline of their proof. Using Munteanu-Wang's argument, in joint work with Guoqiang Wu, we provide an alternative proof of "any Kähler-Ricci shrinker with positive bisectional curvature must be compact". Later, I prove that any Kähler-Ricci shrinker with positive orthogonal bisectional curvature must be compact. I also obtain a classification of the Kähler-Ricci shrinker with nonnegative orthogonal bisectional curvature.

(9) 张永兵 (中国科学技术大学)

**Title:** Volume renormalization of minimal surfaces in ACH space and CR invariants

**Abstract:** We compute the renormalization of the weighted area of a minimal surface which is asymptotic to a transverse curve in the CR manifold at the infinity boundary of an asymptotic complex hyperbolic space, and obtain a CR invariant whose critical points are chains in CR manifolds. We may also talk about the case of a horizontal curve as the asymptotic boundary.

(10) 周恒宇 (重庆大学)

**Title:** A generalized-solution approach to the Dirichlet problem of translating mean curvature equations

**Abstract:** In this work we propose a generalized-solution approach to the Dirichlet problem of translating mean curvature equations on smooth domains in Riemannian manifolds. This approach is inspired from the Miranda-Giusti's generalized-solution theory on nonparametric minimal surface equations. The existence of such quasi-solutions are obtained on bounded domain for  $L^1$  boundary data. If the domain is mean convex and does not contain minimal closed minimal surfaces, the boundary data is continuous, the quasi-solution is a classical solution.