

几何分析春季会议手册

二零二六年三月于合肥



会议须知

为深入探讨几何分析方向发展新趋势，促进高校之间的学术交流与合作，中国科学技术大学分析中心在安徽合肥举办“2026几何分析春季会议”。

一、主办单位

主办单位：中国科学技术大学分析中心

二、组织委员会 (姓氏拼音为序):

李嘉禹 (中国科学技术大学)

盛为民 (浙江大学)

张 希 (南京理工大学)

三、会议资助

国家自然科学基金项目“黎曼几何中的若干分析与变分问题及相关应用”、“复向量丛上的非线性分析”和“几何流及其应用”经费；中国科学技术大学分析中心项目经费。

四、会议有关安排

- 会议时间：2026年3月13日-20日 (3月13日报到，3月20日离会)
- 报到地点：合肥施柏阁大观酒店 (包河区衡山路1号)
- 报销须知：食宿及交通等费用敬请自理

会议日程

2026年3月13 - 20日

日期	时间段		活动	主持人
03.13 星期五	14: 00- 20:00		报到	
03.14 星期六 永乐半山一楼宴会A厅	上午	8:50-9:00	开幕式	李嘉禹
		9:00-9:45	刻画无穷多面体 葛化彬（中国人民大学）	张立群
		9:55-10:40	On Willmore 2-spheres in the n-sphere 王鹏（福建师范大学）	陈大广
		10:40-11:00	休息	
		11:00-11:45	Some comparison theorems in Kahler Geometry 楚健春（北京大学）	林 勇
	午餐	11:45-14:30	午餐及午休	
	下午	14:30-15:15	Local potential and H\"older estimates for the linearized Monge-Amp\ere equation 周斌（北京大学）	朱小华
		15:15-15:35	休息	
		15:35-16:20	Finite dimensional results for some geometric PDEs 朱苗苗（上海交通大学）	刘艳楠
		16:30-17:15	Ricci flow with L^p curvature bound 沈良明（北京航空航天大学）	周春琴
	晚餐	18:00-20:00	晚餐	
03.15 星期日 永乐半山一楼宴会A厅	上午	9:00-9:45	Infinite discrete Ricci flows 华波波（复旦大学）	黄 勇
		9:55-10:40	Instability of naked singularities: Exterior & Interior 黎俊彬（中山大学）	郑 宇
		10:40-11:00	休息	
		11:00-11:45	Aubin-Yau type equations and the cscK problem in Kahler geometry 张科伟（北京师范大学）	葛建全
	午餐	11:45-14:30	午餐及午休	
	下午	14:30-15:15	Global airy curve flow into Riemannian manifolds 宋翀（厦门大学）	盛为民
		15:15-15:35	休息	
		15:35-16:20	Weighted eigenvalue problem for a class of singular/degenerate k-Hessian equations 黄耿耿（复旦大学）	陈世炳
		16:30-17:15	The dual minkowski problem of p-moment dual entropy 盛利（四川大学）	袁 伟
	晚餐	18:00-20:00	晚餐	

03.16 星期一 施柏阁 一楼九华厅	上午	9:00-9:45	Lipschitz regularity of harmonic map heat flows into $SCAT(0)$ spaces 张会春（中山大学）	熊金钢
		9:55-10:40	Some recent progress on the eigenvalue problem 蒋仁进（首都师范大学）	韩邦先
		10:40-11:00	休息	
		11:00-11:45	Scalar curvature in light of Ricci curvature 朱锦天（西湖大学）	朱 萌
	午餐	11:45-14:30	午餐（施柏阁大观酒店 1 楼自助餐厅）及午休	
	下午	14:30-15:15	Mass-capacity inequality modeled on conformally flat manifolds 毕宇晨（弗莱堡大学）	富 宇
		15:15-15:35	休息	
		15:35-16:20	Some results on submanifolds of high codimensions 丁琪（复旦大学）	刘 勇
		16:30-17:15	Green function rigidity problem for GJMS operators and mass of hypersurfaces 石亚龙（南京大学）	陈 群
	晚餐	18:00-20:00	晚餐	
03.17 星期二 施柏阁 一楼九华厅	上午	9:00-9:45	Local criteria for the existence of Thurston's circle packings 林爱津（国防科技大学）	徐兴旺
		9:55-10:40	Rigidity of positively curved steady Ricci solitons on manifolds and orbifolds 邓宇星（北京理工大学）	陈传强
		10:40-11:00	休息	
		11:00-11:45	On the metric flow structure of the conical Kahler-Ricci flow 简旺键（中国科学院数学与系统科学研究院）	杨义虎
	午餐	11:45-14:30	午餐及午休	
	下午	14:30-17:30	自由讨论	
	晚餐	18:00-20:00	晚餐	

03.18 星期三 施柏阁 一楼九华厅	上午	9:00-9:45	Various optimal Sobolev inequalities 王国芳（弗莱堡大学）	简怀玉	
		9:55-10:40	Strong Green function Rigidity in dimension two 来米加（上海交通大学）	刘 钢	
		10:40-11:00	休息		
		11:00-11:45	Bounding the area of surfaces with prescribed boundary 张旭文（弗莱堡大学）	彦文娇	
	午餐	11:45-14:30	午餐及午休		
	下午	14:30-15:15	The uniformization conjecture in complete non-compact Sasakian manifolds 韩英波（信阳师范大学）	苏广想	
		15:15-15:35	休息		
		15:35-16:20	The Orlicz-Brunn-Minkowski theory for capillary convex bodies 朱保成（陕西师范大学）	周家足	
	晚餐	18:00-20:00	晚餐（施柏阁大观酒店 B1 楼中餐厅）		
	03.19 星期四 施柏阁 一楼九华厅	上午	9:00-9:45	Conformal metrics of the ball with constant σ_k -curvature and constant boundary mean curvature 陈学长（南京大学）	汪徐家
9:55-10:40			Convex hypersurfaces with prescribed Gauss curvature 李奇睿（浙江大学）	熊 革	
10:40-11:00			休息		
11:00-11:45			Orbifold Bogomolov-Gieseker inequalities on compact Kähler varieties 傅鑫（西湖大学）	蒋美跃	
午餐		11:45-14:30	午餐及午休		
下午		14:30-15:15	Metric Extension Problem under Curvature Conditions 王文龙（南开大学）	孙玉华	
		15:15-15:35	休息		
		15:35-16:20	The Christoffel-Minkowski type Problem in hyperbolic space 徐露（湖南大学）	张 希	
晚餐		18:00-20:00	晚餐		
03.20 星期五		全天		离会	

报 告

葛化彬（中国人民大学）

Title: 刻画无穷多面体

Abstract: 早在几千年前人们就知道只有五种正多面体。近几十年来，对于有限多面体，其存在性与刚性已经被刻画的很清楚。但是对于无限多面体的刻画，一直都是富有挑战性的公开问题。本报告中，我们将从几何、分析、随机、组合等多个角度，给出无穷多面体的刻画。这些结果来自与华波波、贾龙松、陆洋翔、汪楚文、余豪、周朴淳、周天等人的合作。

王鹏（福建师范大学）

Title: On Willmore 2-spheres in the n -sphere

Abstract: Willmore surfaces in Möbius geometry are natural generalization of minimal surfaces in space forms. In the 1980s, Bryant first established a classification of Willmore 2-spheres in the 3-sphere, which was later extended by Ejiri to Willmore 2-spheres with dual surfaces in the n -sphere. A complete classification in the n -sphere has remained an open problem for a long time. In 2017, we derived a classification of Willmore 2-spheres in the 5-sphere and recently, we obtain a complete description of all Willmore 2-spheres in the n -sphere. In this talk, we will give a brief introduction to this work. This is based on joint works with Xiang Ma, Franz Pedit and Changping Wang.

楚健春（北京大学）

Title: Some comparison theorems in Kahler Geometry

Abstract: In this talk, we will present some comparison theorems and related open questions in Kahler geometry, including volume, diameter, and eigenvalue comparisons under various curvature assumptions. Then we will focus on rigidity results for eigenvalues on Kahler manifolds with positive Ricci lower bound. More precisely, for those Kahler manifolds whose first eigenvalue agrees with the Ricci lower bound, we will show that the complex projective space is the only one with the largest multiplicity of the first eigenvalue. Moreover, there is a specific gap between the largest and the second largest multiplicity. In the Kahler-Einstein case, almost rigidity results for eigenvalues are also obtained. This is a joint work with Feng Wang and Kewei Zhang.

周斌（北京大学）

Title: Local potential and H^{α} -older estimates for the linearized Monge-Ampère equation

Abstract: We establish local potential estimate and H^{α} -older estimate for solutions of linearized Monge-Ampère equations with the right-hand side being a signed measure, under suitable assumptions on the data. In particular, we obtain a new proof for the H^{α} -older estimate of non-homogeneous linearized Monge-Ampère equation.

朱苗苗（上海交通大学）

Title: Finite dimensional results for some geometric PDEs

Abstract: In this talk, we shall present several finite dimensional results for the solution spaces of some geometric elliptic PDEs (biharmonic functions, Schrödinger type equations) over open manifolds.

沈良明（北京航空航天大学）

Title: Ricci flow with L^p curvature bound

Abstract: We consider the Ricci flow with L^p curvature bound for $p > n/4$ and bounded scalar curvature. We first derive an improved curvature estimate along the Ricci flow. Apply this, we could derive an isoperimetric inequality and heat kernel estimate under integral curvature bound. Finally we show the limit structure including the regular part and singular stratification. This is joint with C. Li and T. Zheng.

华波波（复旦大学）

Title: Infinite discrete Ricci flows

Abstract: In this talk, we introduce discrete Ricci flows on infinite triangulations on surfaces. We prove the well-posedness of the discrete Ricci flows. This is based on joint work with Huabin Ge and Puchun Zhou.

黎俊彬（中山大学）

Title: Instability of naked singularities: Exterior & Interior

Abstract: We will first review some exterior results in the instability of naked singularities. Then we present a new approach to proving instability under interior perturbations, and its implications in the weak cosmic censorship conjecture, one of the most fundamental questions in general relativity.

张科伟（北京师范大学）

Title: Aubin-Yau type equations and the cscK problem in Kahler geometry

Abstract: We show that the entropy in Kahler geometry can be expressed as the derivative of the Monge-Ampere energy along some Aubin--Yau type path. We also present a non-Archimedean version of this statement. Such considerations lead to a new norm for test configurations. And we show that the existence of cscK metrics is equivalent to uniform K-stability with respect to this norm.

宋翀（厦门大学）

Title: Global airy curve flow into Riemannian manifolds

Abstract: The geometric Airy curve flow is a third-order dispersive evolution equation of curves emerging from the research of vortex filament equations. In this talk, we study the Cauchy problem of the geometric Airy curve flow into Riemannian manifolds. For the Euclidean case, Terng proved the global existence for closed curves with trivial normal bundle holonomy. Our main result is the global well-posedness of the flow in the setting of a general Riemannian manifold, without any restriction on the normal holonomy. This is a joint work with Ze Li.

黄耿耿（复旦大学）

Title: Weighted eigenvalue problem for a class of singular/degenerate k -Hessian equations

Abstract: In this talk, we will talk about our recent $C^{1,1}$ estimates on a class of k -hessian equations with $|x|^\alpha$ type degeneracy/singularity. As an application, we also give the existence and uniqueness of eigenfunctions.

盛利（四川大学）

Title: The dual minkowski problem of p -moment dual entropy

Abstract: We introduce the p -moment dual entropy for convex bodies containing the origin and establish for it isoperimetric-type inequalities associated with the Renyi entropy; the case $p = n$ gives an isoperimetric inequality for the entropy itself. A differential formula is derived, leading to the corresponding entropy measure. We prove the existence of solutions to the associated Minkowski problem for $p < 0$, and show that for $1 < p \leq n$, this measure satisfies the p th subspace mass inequality within the class of origin-symmetric convex bodies. This is jointed work with Yin Leiqin.

张会春（中山大学）

Title: Lipschitz regularity of harmonic map heat flows into $\text{CAT}(0)$ spaces

Abstract: In 1964, Eells and Sampson proved the celebrated long-time existence and convergence for the harmonic map heat flow into non-positively curved Riemannian manifolds. In 1992, Gromov and Schoen initiated the study of harmonic maps into $\text{CAT}(0)$ metric spaces. It naturally motivates the study of the harmonic map heat flow into singular metric spaces.

In the 1990s, Mayer and Jost independently extended Crandall-Liggett's theory of gradient flows of convex functionals on $\text{CAT}(0)$ spaces to obtain the weak solutions for the harmonic map heat flow into $\text{CAT}(0)$ spaces. It is a long-standing open question to ask if the weak solutions possess the Lipschitz regularity. Very recently, by using elliptic approximation method, Lin, Segatti, Sire, and Wang proved the weak solutions are Lipschitz in space and $1/2$ -Hölder continuous in time, for a wide class of $\text{CAT}(0)$ spaces.

In this talk, we will introduce a complete solution for this question, showing that every weak solution of the harmonic map heat flow into $\text{CAT}(0)$ spaces is Lipschitz continuous in both space and time. We also establish an Eells-Sampson-type Bochner inequality.

蒋仁进（首都师范大学）

Title: Some recent progress on the eigenvalue problem

Abstract: We shall report our recent work on the eigenvalue problem. It has been a long history toward estimating eigenvalues, asymptotically or uniformly. Among these problems Weyl's conjecture on sharp asymptotic formula and Polya's conjecture on uniform eigenvalue estimate have been cores, where Lieb, Li-Yau, Berezin, Hormander et al. made important contributions. These questions remain wide open. In this report, we shall discuss some recent works regarding quantitative estimates on the remainder of Weyl's law and Polya's conjecture. Our arguments in deriving such uniform estimates yield

also, in all dimensions $n \geq 2$, classes of domains that may even have rather irregular shapes or boundaries but satisfy Pólya's conjecture. Another key observation is that on strip-tiling domains (and therefore any triangles for instance) one actually has better eigenvalue estimates than Pólya conjectured.

朱锦天（西湖大学）

Title: Scalar curvature in light of Ricci curvature

Abstract: In this talk, we will introduce some results of scalar curvature, which are motivated by the Cheeger-Gromoll splitting theorem and the Calabi-Yau minimal volume growth theorem in the research of Ricci curvature. The talk is based on some works of myself and some works joint with Shihang He.

毕宇晨（弗莱堡大学）

Title: Mass-capacity inequality modeled on conformally flat manifolds

Abstract: We establish a mass-capacity inequality for generalized asymptotically flat spin manifolds with nonnegative scalar curvature. Equality holds if and only if the manifold is harmonically conformal to Euclidean space minus a closed set of small Hausdorff dimension. This is joint work with Jintian Zhu.

丁琪（复旦大学）

Title: Some results on submanifolds of high codimensions

Abstract: In this talk, we present our recent results concerning two classes of submanifolds in high codimensions. The first concerns the integrability of minimal cones in Euclidean space, a topic of importance in the study of uniqueness problems. This work is joint with Lei Zhang. The second focuses on the compactness and regularity of Hamiltonian stationary Lagrangian submanifolds, which are closely related to the existence problem for volume minimizers within Lagrangian homology classes.

石亚龙（南京大学）

Title: Green function rigidity problem for GJMS operators and mass of hypersurfaces

Abstract: The Green functions of GJMS operators on spheres have special forms involving only the extrinsic distance. It is conjectured that this property uniquely characterizes round spheres among closed hypersurfaces in Euclidean spaces. In this talk, we shall prove this conjecture for conformal Laplacian. The main tools are the Positive Mass Theorem and Hartman-Nirenberg's theorem on complete flat hypersurfaces. Parallel results concerning Paneitz operator will also be discussed. This is joint work with Xuezhong Chen and Jiaxue Gan.

林爱津（国防科技大学）

Title: Local criteria for the existence of Thurston's circle packings

Abstract: In this talk, we will introduce the character of Thurston's circle packings and give some simple criteria for the existence of circle packings. As applications, we obtain a new proof of the uniformization theorem and give a new descriptions of the curvature image set. To approach our results, we shall use the combinatorial Ricci flows as a fundamental tool.

邓宇星（北京理工大学）

Title: Rigidity of positively curved steady Ricci solitons on manifolds and orbifolds

Abstract: Steady Ricci solitons are important examples of type II singularity models. In higher dimensions, singularity models can be steady Ricci solitons on orbifolds. In this talk, we will review some rigidity theorems on positively curved steady Ricci solitons on manifolds. We will also classify positively curved noncollapsed steady Ricci solitons on orbifolds that dimension reduce to quotients of spheres. This talk is based on the paper at arXiv:2504.14525.

简旺键（中国科学院数学与系统科学研究院）

Title: On the metric flow structure of the conical Kahler-Ricci flow

Abstract: The compactness theorems play an important role in the Ricci flow theory. Bamler developed the theory of the so-called metric flow, and develop the compactness theory of the Ricci flow in the metric flow category. An

important example of the metric flow is the 3-dim singular Ricci flow. In this talk, we will show that the conical Kahler-Ricci flow possess the metric flow structure (till the finite-time singularity). This is a joint-work with Max Hallgren and Jian Song.

王国芳（弗莱堡大学）

Title: Various optimal Sobolev inequalities

Abstract: The optimal Sobolev inequality plays an important role in geometric analysis, especially in the Yamabe problem. In the talk I will introduce its counterparts for spinor fields, vector fields and differential forms. This field is not well explored and leaves many interesting open questions.

来米加（上海交通大学）

Title: Strong Green function Rigidity in dimension two

Abstract: X. Chen and Y. Shi investigated Green's function on round spheres for various conformally invariant operators, including the conformal Laplacian and the Paneitz operator. In these settings, the Green's function admits a neat expression in terms of the ambient Euclidean distance. They then conjectured that the converse holds even if such an expression is assumed only at a single point. Chen and Shi have verified their conjecture for the conformal Laplacian in dimensions $n \geq 3$. In this talk, I will present a positive answer to Chen–Shi's conjecture for the Laplace operator in dimension $n = 2$. More precisely, let $M \subset \mathbb{R}^3$ be a closed C^2 embedded surface and suppose that there exists a point $p \in M$ such that the Green's function of the Laplacian satisfies $G(p, q) = -\frac{1}{2\pi} \ln d_{\mathbb{R}^3}(p, q) + c, \forall q \neq p$, then M must be a round sphere. This is a joint work with Chilin Zhang.

张旭文（弗莱堡大学）

Title: Bounding the area of surfaces with prescribed boundary

Abstract: Given an $(m-1)$ -dimensional, embedded, compact submanifold Γ in $\mathbb{R}^n$, consider any compact, immersed m -dimensional submanifold whose boundary is exactly given by Γ . In this talk, we show how the area of such an m -submanifold is controlled in terms of its curvature energy. The talk is based on joint work with Ernst Kuwert.

韩英波（信阳师范大学）

Title: The uniformization conjecture in complete non-compact Sasakian manifolds

Abstract: The CR analogue of Yau uniformization conjecture states that any complete noncompact Sasakian manifold of positive CR holomorphic bisectional curvature is CR biholomorphic to the standard Heisenberg group. In this talk, we first show that there exists a nonconstant CR holomorphic function of polynomial growth in a complete noncompact Sasakian manifold of nonnegative pseudohermitian bisectional curvature with the CR maximal volume growth property. Then by using Sasaki-Ricci flow, we affirm the partial result of the above conjecture on Sasakian manifolds. More precisely, we show that a complete noncompact Sasakian manifold M^{2n+1} of nonnegative transversal bisectional curvature with maximal volume growth is CR biholomorphic to $\Omega \times \mathbb{R}$, where Ω is a pseudoconvex domain of $\mathbb{C}^n$.

朱保成（陕西师范大学）

Title: The Orlicz-Brunn-Minkowski theory for capillary convex bodies

Abstract: In this talk, we will introduce a Robin boundary analogue of the Orlicz-Minkowski problem, which seeks to characterize capillary convex bodies with prescribed capillary Orlicz surface area measures in the upper Euclidean half-space. By applying the continuity method, we establish the existence of volume-normalized smooth solutions to the capillary even Orlicz-Minkowski problem.

陈学长（南京大学）

Title: Conformal metrics of the ball with constant σ_k -curvature and constant boundary mean curvature

Abstract: We apply the Obata-Escobar type argument to classify conformal metrics in the ball having constant σ_k -curvature and constant boundary mean curvature. This is a natural extension of Escobar's result for $k = 1$ in 1990. Our method is adapted for all types of cones: positive and negative. This is a joint work with Wei Wei.

李奇睿（浙江大学）

Title: Convex hypersurfaces with prescribed Gauss curvature

Abstract: We discuss some geometric variational problems arising from the characterization of convex hypersurfaces with prescribed Gauss curvature. Such problems can be equivalently formulated as solving certain Monge-Ampere type equations. The variational structure of these problems plays a crucial role in the study.

傅鑫（西湖大学）

Title: Orbifold Bogomolov-Gieseker inequalities on compact Kähler varieties

Abstract: We give a characterization on the stable reflexive sheaf when the Bogomolov-Gieseker equality holds. This is a joint work with Wenhao Ou.

王文龙（南开大学）

Title: Metric Extension Problem under Curvature Conditions

Abstract: Gromov asked whether an arbitrary boundary metric on a compact manifold with boundary can always be extended to a global metric with positive scalar curvature. In this talk, I will first review the resolution of this question and its application to the non-fill-in problem, based on joint work with Prof. Yuguang Shi and Guodong Wei. Then I will discuss recent developments regarding this metric extension problem under stronger curvature conditions, based on joint work with Jintian Zhu. We show that extensions always exist under positive Ricci curvature conditions, but not necessarily under positive sectional curvature. For negative sectional curvature, we identify a global obstruction and prove solvability in certain cases where this obstruction vanishes.

徐露（湖南大学）

Title: The Christoffel-Minkowski type Problem in hyperbolic space

Abstract: In this talk, we first introduce the classical Christoffel-Minkowski problem and L_p Christoffel-Minkowski problem in Euclidean space. Then we give some examples on Christoffel-Minkowski type problem in hyperbolic space. We generalize this type problem to quotient Hessian equation and get the existence of uniformly h -convex solutions. At last, we focus on the constant rank theorem in hyperbolic space.