



南京大学
NANJING UNIVERSITY

数学学院
SCHOOL OF MATHEMATICS

2026几何分析国际会议

International Conference on Geometric Analysis

会议手册

2026年6月



General Information

Organizing Committee:

Xuezhang Chen, Jiayu Li, Xingwang Xu

Institute of Mathematical Science

School of Mathematics

Nanjing University

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Support:

School of Mathematics, Nanjing University

Institute of Mathematical Science, Nanjing University

Hotel & Transportation

Accommodation Hotel:

New Era Hotel, No. 251 Zhongshan Road, Nanjing

Transportation

★ By air:

Nanjing Lukou International Airport is approximately 43 kilometers from New Era Hotel, a 1-hour drive away with a taxi fare of over 200 yuan. You may also take the metro: Board Metro Line S1 at Lukou Airport Station to Nanjing South Railway Station, transfer to Metro Line 1 and alight at Zhujiang Road Station (Exit 1 or Exit 3). Walk 350 meters to reach the hotel. The whole journey takes around 1.5 hours.

★ By high-speed train:

Most high-speed trains arrive at Nanjing South Railway Station. Metro is recommended: Take Metro Line 1 directly to Zhujiang Road Station (Exit 1 or Exit 3), then walk 350 meters to the hotel. The trip takes about 30 minutes. A taxi ride also takes 30 minutes, with a high risk of traffic jams.

★ By train:

A small number of high-speed trains and bullet trains stop at Nanjing Railway Station. It is advised to take Metro Line 1 to Zhujiang Road Station (Exit 1 or Exit 3), followed by a 350-meter walk to the hotel. The journey lasts roughly 25 minutes. A taxi takes around 20 minutes, but traffic congestion is likely during rush hours.

Schedule

Jun 7(Sun)		
14:00–20:30	Registration （ New Era Hotel ）	
Jun 8 (Mon)	West Building Lecture Hall 308	
08:50–09:00	Opening Remarks	
	Speaker	Title
09:00-09:50	Changfeng Gui University of Macau	Some new inequalities in analysis and geometry
09:50-10:20	Tea Break	
10:20–11:10	Huichun Zhang Sun Yat-sen University	Lipschitz regularity of harmonic maps heat flow into non-positively curved metric spaces
11:30	Lunch Nanfangyuan Restaurant	
14:00-14:50	Wenshuai Jiang Zhejiang University	Bounded diameter and finite measure estimate of the singular set of mean curvature flow

Jun 8 (Mon) West Building Lecture Hall 308

	Speaker	Title
15:00-15:50	Dongmeng Xi Shanghai University	The Mahler conjecture in three dimensions
15:50-16:20	Tea Break	
16:20-17:10	Shiping Liu USTC	Discrete Ricci curvature and Terwilliger's conjecture
18:00-20:00	Dinner Nanfangyuan Restaurant	

Jun 9 (Tue) West Building Lecture Hall 308

	Speaker	Title
09:00-09:50	Xiaonan Ma Nankai University	From the signature of a quadratic form to the Eta invariant
09:50-10:20	Tea Break & Group Photo	
10:20-11:10	Jingang Xiong Beijing Normal University	Optimal weighted smoothing and asymptotics of ancient solutions for fast diffusion equations

Jun 9 (Tue) West Building Lecture Hall 308

	Speaker	Title
11:30	Lunch Nanfangyuan Restaurant	
14:00-14:50	Xi Zhang Nanjing University of Science and Technology	A generalized Bogomolov type inequality on Higgs bundles
15:00-15:50	Paul Laurain Université Gustave Eiffel	Huber's theorems in dimensions 2 and 4
15:50-16:20	Tea Break	
16:20-17:10	Zuoqin Wang USTC	Improvements of several eigenvalue inequalities on spheres
18:00-20:00	Banquet, Jiahe Hall, 2nd Floor, New Era Hotel	

Jun 10 (Wed) West Building Lecture Hall 308

	Speaker	Title
09:00-09:50	Lei Ni Zhejiang Normal University & UCSD	Bochner techniques in complex geometry
09:50-10:20	Tea Break	
10:20-11:10	Sebastian Heller BIMSA	Embedded special Legendrian surfaces in the 5-sphere
11:30	Lunch Nanfangyuan Restaurant	
Afternoon	Free discussions	

Jun 11 (Thu) West Building Lecture Hall 308

	Speaker	Title
09:00-09:50	Bo Guan The Ohio State University	Nonlinear PDEs of eigenvalues of Riemannian curvature operator
09:50-10:20	Tea Break	
10:20-11:10	Yi Wang Johns Hopkins University	Sharp comparisons between sliced and standard 1-Wasserstein distances
11:30	Lunch Nanfangyuan Restaurant	
14:00-14:50	Jingyi Chen University of British Columbia	Holomorphicity of area minimizing disk with free boundary
15:00-15:50	Hao Fang University of Iowa	Gårding polynomials and Liouville rigidity for Hessian-type PDEs
15:50-16:20	Tea Break	
16:20-17:10	Pak Tung Ho Tamkang University	The invariant surface area functional in 3-dimensional CR geometry
18:00-20:00	Dinner Nanfangyuan Restaurant	

Jun 12 (Fri) West Building Lecture Hall 308

	Speaker	Title
09:00-09:50	Qing Han University of Notre Dame	Parametrizations of solutions to the Yamabe equation with isolated singularities
09:50-10:20	Tea Break	
10:20-11:10	Bin Zhou Peking University	Partial Legendre transform in Monge-Ampère type equations
11:30	Lunch Nanfangyuan Restaurant	
14:00-14:50	Fang Wang Shanghai Jiao Tong University	Relative fractional Yamabe constants for Poincaré-Einstein manifolds
15:00-15:50	Lei Liu Central China Normal University	Super-Liouville equation with a spinorial Yamabe type term
15:50-16:20	Tea Break	
16:20-17:10	Jie Zhou Capital Normal University	Linear bi-Lipschitz quantitative rigidity for L^2 almost-CMC surfaces
18:00-20:00	Dinner Nanfangyuan Restaurant	

Titles and abstracts

Jingyi Chen (University of British Columbia)

Title: Holomorphicity of area minimizing disk with free boundary

Abstract: We will study holomorphicity of area minimizing disks with free boundary on a closed Lagrangian surface in almost Kähler surface.

Hao Fang (University of Iowa)

Title: Gårding polynomials and Liouville rigidity for Hessian-type PDEs

Abstract: We discuss several results highlighting connections between geometry and Hessian-type PDEs. The first part introduces Gårding polynomials, motivated by the ellipticity requirement from the Caffarelli--Nirenberg--Spruck theory for fully nonlinear PDEs. The theory involves closure under positive affine transforms and polarization, together with a recursive characterization. A connection with matroid generating functions will be briefly mentioned. The second part concerns Liouville rigidity for closed Hessian constraints defined by admissible sets in the space of real symmetric or complex Hermitian forms. Admissibility is formulated by monotonicity, convexity, subharmonicity, and a log-positive reduction condition.

Bo Guan (Ohio State University)

Title: Nonlinear PDEs of eigenvalues of Riemannian curvature operator

Abstract: We wish to explore how the geometry of manifolds may be understood through nonlinear equations involving the eigenvalues of Riemannian curvature operator. As preliminary results we prove the existence of conformal metrics governed by a class of such equations. This talk is based on joint work with Heming Jiao.

Changfeng Gui (University of Macau)

Title: Some new inequalities in analysis and geometry

Abstract: The classical Moser-Trudinger inequality is a borderline case of Sobolev inequalities and plays an important role in geometric analysis and PDEs in general. Aubin in 1979 showed that the best constant in the Moser-Trudinger inequality can be improved by reducing to one half if the functions are restricted to the complement of a three dimensional subspace of the Sobolev space H^1 , while Onofri in 1982 discovered an elegant optimal form of Moser-Trudinger inequality on sphere. In this talk, I will present new sharp inequalities which are variants of Aubin and Onofri inequalities on the sphere with or without mass center constraints.

Efforts have also been made to show similar inequalities in higher dimensions. We have improved Beckner's inequality, the higher dimensional counterpart of Onofri's inequality, for axially symmetric functions when the dimension $n=4,6,8$. Numerical computations are exploited to provide rigorous proof.

I will also present some new results on higher dimensional counterpart of Huber's isoperimetric inequalities.

Qing Han (University of Notre Dame)

Title: Parametrizations of solutions to the Yamabe equation with isolated singularities

Abstract: In this talk, we study parametrizations of solutions to the Yamabe equation with nonremovable isolated singularities by harmonic functions, or more precisely, by sequences of spherical harmonics. There is a one-to-one correspondence between the collection of the solutions to the Yamabe equation with nonremovable isolated singularities and the collection of the sequences of spherical harmonics through formal infinite series determined by the sequences of spherical harmonics. We prove that these formal infinite series yield actual solutions to the Yamabe equation with a nonremovable isolated singularity. These solutions to the Yamabe equation have designated asymptotic behaviors determined by the sequences of spherical harmonics.

Sebastian Heller (BIMSA)

Title: Embedded special Legendrian surfaces in the 5-sphere

Abstract: In this talk, I will describe the first examples of compact embedded special Legendrian surfaces of genus $g > 1$ in the 5-sphere. The construction combines integrable systems techniques with gauge-theoretic methods. In the first part, I will outline the main ideas underlying the construction of these surfaces; in the second part, I will explain how to show their embeddedness. This talk is based on arXiv:2604.21521.

Puk Tung Ho (Tamkang University)

Title: The invariant surface area functional in 3-dimensional CR geometry

Abstract: In this talk, I will talk about the two invariant surface area functional in 3-dimensional CR manifolds, which were first studied by Jih-Hisn Cheng, Paul Yang, and Yongbing Zhang. In particular, I will talk about these invariant area functionals on the disk bundle, on the Rossi sphere, and on the 3-dimensional tori.

Wenshuai Jiang (Zhejiang University)

Title: Bounded diameter and finite measure estimate of the singular set of mean curvature flow

Abstract: In this talk, we will study the mean curvature flow in $\mathbb{R}^3$. It is well known that finite-time singularities are inevitable, hence an interesting problem in the study of mean curvature flow is to understand the size of the singular set and the geometry of the flow near singularities. We will show that the intrinsic diameter is uniformly bounded as one approach the singular time, which confirms a conjecture of Haslhofer, and we show that the singular set has finite 1-Hausdorff measure. This is a joint work with Yiqi Huang.

Paul Laurain (Université Gustave Eiffel)

Title: Huber's theorems in dimensions 2 and 4

Abstract: After recalling the classical statement of Huber's second theorem, I will propose an approach via the moving frame method. I will then present the state of the art on generalizations of this theorem to dimension 4, emphasizing that these do not yet yield a complete generalization. Next, drawing inspiration from the moving frame approach, we will present a new advance toward a full characterization. Finally, I will give some applications to the extrinsic case. Joint work with Dorian Martino.

Lei Liu (Central China Normal University)

Title: Super-Liouville equation with a spinorial Yamabe type term

Abstract: In this talk, we study the super-Liouville equation with a spinorial Yamabe type term, a natural generalization of Liouville equation, super-Liouville equation and spinorial Yamabe type equation. We establish some refined qualitative properties for such a blow-up sequence. In particular, we show energy identities not only for the spinor part but also for the function part. Moreover, the local masses at a blow-up point are also computed. A new phenomenon is that there are two kinds of singularities and local masses due to the nonlinear spinorial Yamabe type term, which is different from super-Liouville equation. This is a joint work with Mingjun Wei.

Shiping Liu (University of Science and Technology of China)

Title: Discrete Ricci curvature and Terwilliger's conjecture

Abstract: Given a discrete space with local structural restrictions, it is natural to ask how large can such a space be. We will report recent progresses on the study of the Terwilliger's conjecture (JCTB 1983) on finiteness of the so-called amply regular graphs. We discuss an approach by considering the heat diffusion on such graphs. A key concept is a discrete Ricci curvature notion a la Bakry and Emery which is calculated by eigenvalues of local graphs. As a byproduct, we derive a weak version of a conjecture due to Qiao, Park and Koolen.

Xiaonan Ma (Nankai University)

Title: From the signature of a quadratic form to the eta invariant

Abstract: The eta invariant of a self-adjoint elliptic operator can be viewed as the infinite-dimensional analogue of the signature of symmetric matrix.

When computing the signature associated with Poincaré duality on manifolds with boundary, the eta invariant appears as the contribution from the boundary. This is one of the important examples of the Atiyah–Patodi–Singer Index Theorem. The eta invariant has subsequently found wide applications in mathematical physics as well.

In this talk, we will describe this story, and discuss the properties and applications of the eta invariant, as well as our localization formula for the eta invariant in the presence of group actions.

Lei Ni (Zhejiang Normal University & UCSD)

Title: Bochner techniques in complex geometry

Abstract: I will discuss two types of Bochner techniques and some recent results derived out of them and some related open problems.

Fang Wang (Shanghai Jiao Tong University)

Title: Relative fractional Yamabe constants for Poincaré-Einstein manifolds

Abstract: In this talk, I will introduce some basic properties for the relative fractional Yamabe constants defined on the conformal infinity of a Poincaré-Einstein manifold, as well as its geometric applications.

Yi Wang (Johns Hopkins University)

Title: Sharp comparisons between sliced and standard 1-Wasserstein distances

Abstract: Optimal transport describes the process of finding the most efficient way to move mass between two distributions. Wasserstein distance measures the minimal transportation cost achieved by that optimal plan. However, in higher dimensions, computing the Wasserstein distance becomes computationally expensive. The sliced Wasserstein distance offers an effective and efficient way to alleviate this burden. In this talk, I will talk about the quantitative estimates between the sliced 1-Wasserstein distance and the 1-Wasserstein distance. I will then discuss our construction of a concrete example that demonstrates the exponents in the estimate are sharp. This is joint work with Guillaume Carlier, Alessio Figalli, Quentin Merigot.

Zuoqin Wang (University of Science and Technology of China)

Title: Improvements of several eigenvalue inequalities on spheres

Abstract: Let g be any Riemannian metric on S^2 with volume 4π . A beautiful isoperimetric inequality proven by Hersch in 1970 states that the sum of the reciprocals of the first three nonzero eigenvalues is at least $3/2$. In this talk I will present an improvement of Hersch's inequality, together with an improvement of Nadirashvili's inequality on the second eigenvalue. These improved inequalities give more restrictions on the possible distribution of the first two nonzero eigenvalues of S^2 . The same method also applies to compact surfaces that can be minimally embedded in S^n by first eigenfunctions, and produce an improvement of an inequality for the first eigenvalue proven by Li-Yau in 1982. This is a joint work with Qingwei Zeng.

Dongmeng Xi (Shanghai University)

Title: The Mahler conjecture in three dimensions

Abstract: We settle the three-dimensional Mahler conjecture for arbitrary convex bodies. Prior to this work, this conjecture had remained open in every dimension $n \geq 3$ since Mahler's original work in 1938. More precisely, for every convex body $K \subset \mathbb{R}^3$, we prove the sharp inequality

$$|K| |K^z| \geq \frac{64}{9},$$

where K^z denotes the polar of K with respect to an arbitrary interior point $z \in \text{int}K$. Equality is attained when K is a simplex and z is its centroid.

The key ingredient in our proof is a new framework called shadow flow, based on a new notion of admissible speed for the classical shadow systems of Rogers and Shephard. Along such flows, any three-dimensional polytope can be deformed into a simplex; in the centrally symmetric case, it can be deformed into a cube or an octahedron. This method not only proves the Mahler conjecture for arbitrary three-dimensional convex bodies, but also yields a new purely geometric proof of the three-dimensional symmetric Mahler inequality, originally proved by Iriyeh and Shibata. This talk is based on joint work with Shibing Chen, Yuanyuan Li, and Zhe-Feng Xu.

Jingang Xiong (Beijing Normal University)

Title: Optimal weighted smoothing and asymptotics of ancient solutions for fast diffusion equations

Abstract: We establish sharp weighted smoothing estimates for weak solutions to the Cauchy-Dirichlet problem for the fast diffusion equation on smooth bounded domains. We demonstrate that the critical exponent governing these estimates coincides with the classical Brezis--Turner exponent known in the theory of semilinear elliptic equations. As a primary application, we derive improved global Harnack inequalities and describe asymptotic behavior of positive ancient solutions. This is joint with X. Jiang and H. Wang.

Huichun Zhang (Sun Yat-sen University)

Title: Lipschitz regularity of harmonic maps heat flow into non-positively curved metric spaces

Abstract: In 1964, Eells and Sampson proved the 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 non-positively curved metric spaces. In the 1990s, Mayer and Jost independently extended Crandall-Liggett's theory of gradient flows of convex functionals on non-positively curved metric spaces, and obtained the weak solutions for the harmonic map heat flows into such metric spaces. It is a long-standing open question to ask if the weak solutions possess the Lipschitz regularity. This was settled by us and F. H. Lin-C. Y. Wang. We also establish an Eells-Sampson-type Bochner inequality. This is joint with X.-P. Zhu.

Xi Zhang (Nanjing University of Science and Technology)

Title: A generalized Bogomolov type inequality on Higgs bundles

Abstract: Higgs bundle was introduced by Hitchin, it closely related to multiple fields such as non-abelian Hodge correspondence, algebraic geometry, Kähler geometry and group representations. In this talk, we introduce our recent work on the existence of L^p -approximate critical Hermitian structures on Higgs bundles. As its applications, we obtain a generalized Bogomolov type inequality on Higgs bundles and a Miyaoka-Yau inequality for minimal Kähler models. These works are joint with Chao Li, Chuanjing Zhang and Shiyu Zhang.

Bin Zhou (Peking University)

Title: Partial Legendre transform in Monge-Ampère type equations

Abstract: In this talk, I will report the recent progress on the applications of partial Legendre transform in the Monge-Ampère equation, linearized Monge-Ampère equation as well as Monge-Ampère type fourth order equations.

Jie Zhou (Capital Normal University)

Title: Linear bi-Lipschitz quantitative rigidity for L2 almost-CMC surfaces

Abstract: In this presentation, we talk about the quantitative rigidity result for almost constant mean curvature spheres in R^3 . Under a sub-two-sphere Willmore bound and a small L^2 -CMC defect assumption, we show that an almost-CMC surface is close to the round sphere, with linear control of the $W^{2,2}$ distance of the parametrization and the L^∞ norm of the conformal factor. An analogous statement holds under an a priori area bound below that of two spheres. This quantitative rigidity relies on a linearized analysis around the sphere. A previously established qualitative rigidity result provides the initial closeness required to enter the perturbative regime. The estimate further extends to integral 2-varifolds of unit density using known regularity and density results. This is a joint work with Yuchen Bi at University of Freiburg.

