

China-Japan Geometry Conference Schedule

Date: September 23, 2025

Venue: 3rd Floor, Charlie Hall (三楼, 查理厅)

Time	Event	Chair
09:00-09:30	Openning Ceremony Gang Tian, Hiroshi Tamaru	Xi Zhang
09:30-10:20	Speaker: Weiping Zhang Title: Deformations of Dirac operators	Takashi Shioya
10:40-11:30	Speaker: Ryushi Goto Title: Generalized scalar curvature, Moment maps, and the generalized Kähler-Ricci flow	Zizhou Tang
11:30-14:30	Lunch (Banquet Hall A on the 2nd floor, 二楼宴会A厅) Noon Break	
14:30-15:20	Speaker: Qing-Ming Cheng Title: Complete δ -stable minimal hypersurfaces	Changping Wang
15:20-15:40	Tea Break	
15:40-16:30	Speaker: Binglong Chen Title: Local regularity of spacetimes under Ricci curvature and Lie derivative conditions	Xiaoping Yang
16:40-17:30	Speaker: Takayuki Okuda Title: A categorical framework on Coarse geometry	Zhenlei Zhang
18:00-20:30	Banquet (Banquet Hall A on the 2nd floor, 二楼宴会A厅)	

China-Japan Geometry Conference Schedule

Date: September 24, 2025

Venue: 3rd Floor, Charlie Hall (三楼, 查理厅)

Time	Event	Chair
09:00-09:50	Speaker: Xiangyu Zhou Title: Some recent progress in several complex variables	Jiayu Li
09:50-10:20	Tea Break	
10:20-11:10	Speaker: Yohei Sakurai Title: Almost splitting and quantitative stratification for super Ricci flow	Weimin Sheng
11:20-12:10	Speaker: Jianquan Ge Title: Compact submanifolds with pinched Ricci curvature	Xiao Zhang
12:10-15:00	Lunch (Banquet Hall C on the 2nd floor, 二楼宴会C厅) Noon Break	
15:00-15:50	Speaker: Reiko Miyaoka Title: Chern's conjecture in the Dupin case	Yuan Lou
16:10-17:00	Speaker: Peng Wang Title: On the classification of Willmore 2-spheres in the n-sphere	Yong Huang
17:30-20:30	Dinner (Banquet Hall C on the 2nd floor, 二楼宴会C厅)	

China-Japan Geometry Conference Schedule

Date: September 25, 2025

Venue: 3rd Floor, Charlie Hall (三楼, 查理厅)

Time	Event	Chair
09:00-09:50	Speaker: Kefeng Liu Title: Automorphic cohomology, the Penrose transform, and non-classical flag domains	Ayato Mitsuishi
09:50-10:20	Tea Break	
10:20-11:10	Speaker: Koji Fujiwara Title: The rates of growth in hyperbolic groups	Guofang Wang
11:20-12:10	Speaker: Jiyuan Han Title: On H-minimizer of a Fano fibration	Jiazou Zhou
12:10-15:00	Lunch (Banquet Hall C on the 2nd floor, 二楼宴会C厅) Noon Break	
15:00-15:50	Speaker: Kenji Fukaya Title: Functoriality of Lagrangian Floer theory and its application	Xiaohua Zhu
16:10-17:00	Speaker: Yong Wei Title: Volume preserving Gauss curvature flow in hyperbolic space	Huitao Feng
17:20-18:20	Organizer meeting	
17:30-20:30	Dinner (Banquet Hall C on the 2nd floor, 二楼宴会C厅)	

China-Japan Geometry Conference Schedule

Date: September 27, 2025

Venue: 2nd Floor, Banquet Hall B (二楼, 宴会B厅)

Time	Event	Chair
09:00-09:50	Speaker: Akito Futaki Title: Hodge Laplacian and geometry of Kuranishi family of Fano manifolds	Xingwang Xu
09:50-10:20	Tea Break	
10:20-11:10	Speaker: Bo Liu Title: Dai-Zhang higher spectral flow and differential K-theory	Takefumi Kondo
11:20-12:10	Speaker: Yoshinori Hashimoto Title: Calabi's extremal metrics and non-Archimedean potentials	Huaiyu Jian
12:10-15:00	Lunch (Banquet Hall C on the 2nd floor, 二楼宴会C厅) Noon Break	
15:00-15:50	Speaker: Takao Yamaguchi Title: Geometry of limits of manifolds with boundary	Huichun Zhang
16:10-17:00	Speaker: Zhichao Wang Title: Existence of embedded minimal tori in 3-sphere with positive Ricci curvature	Qing Ding
17:15-17:30	Announce the 11th Japan-China Geometry Conference	Ayato Mitsuishi
17:30-18:00	Closing Ceremony Qing-Ming Cheng, Weiping Zhang, Hitoshi Moriyoshi	Wenjiao Yan
18:00-20:30	Dinner (Banquet Hall C on the 2nd floor, 二楼宴会C厅)	

Abstract

Speaker: Weiping Zhang (Nankai University)

Title: Deformations of Dirac operators

Abstract: Dirac operators, as well as their deformations, play important roles in many problems of geometry and topology. We will discuss some aspects of it.

Speaker: Ryushi Goto (The University of Osaka)

Title: Generalized scalar curvature, Moment maps, and the generalized Kähler-Ricci flow

Abstract: It is well known that, on Kähler manifolds, the scalar curvature can be interpreted as a moment map, a perspective often referred to as the Fujiki-Donaldson picture. In this talk, I will present an extension of this framework to generalized Kähler manifolds. Using spinors, I introduce a notion of generalized scalar curvature and establish necessary and sufficient conditions for it to arise as a moment map. An obstruction to the existence of such a moment map naturally appears as a cohomology class determined by a certain 2-cocycle, and I will describe the resulting properties of the moment map picture when this class vanishes, in connection with recent works of Apostolov-Streets-Ustinovskiy, Inoue, and Lahdili. Furthermore, I will present a spinorial formulation of the generalized Kähler-Ricci flow and discuss an extension of Perelman's entropy functional together with its monotonicity.

Speaker: Qing-Ming Cheng (Chongqing University of Technology & Osaka Metropolitan University)

Title: Complete δ -stable minimal hypersurfaces

Abstract: In this talk, we shall talk about complete two-sided stable minimal hypersurfaces in Euclidean spaces. Firstly, we consider the Bernstein problem and discuss the detailed progress on the stable Bernstein problem. Secondly, we also discuss complete two-sided δ -stable minimal hypersurfaces.

Abstract

Speaker: Binglong Chen (Sun Yat-sen University)

Title: Local regularity of spacetimes under Ricci curvature and Lie derivative conditions

Abstract: In this talk, we will derive a local first order estimate for any four dimensional spacetime, in terms of local bounds of the Ricci curvature and Lie derivative of the Lorentzian metric with respect to a timelike vector field. Higher order estimates can also be obtained, provided that more covariant derivatives of the Ricci curvature and Lie derivative of the metric are bounded.

Speaker: Takayuki Okuda (Hiroshima University)

Title: A categorical framework on Coarse geometry

Abstract: Coarse geometry studies the large-scale behavior of spaces. The subject was initiated by Gromov in the 1980s for metric spaces and was systematically developed in the 2000s by J. Roe through the notions of coarse spaces and their associated geometry. However, Roe's formulation of coarse spaces is based on the category of sets with binary relations, which can appear somewhat inaccessible to those unfamiliar with this categorical setting. In this talk, I propose an alternative approach: instead of the category of sets with binary relations, we consider the category of power sets with union-preserving maps. Using the language of this category, I will present a reformulation of coarse spaces and introduce a categorical framework in which coarse geometry and the coarse category can be developed.

Speaker: Xiangyu Zhou (Chinese Academy of Sciences)

Title: Some recent progress in several complex variables

Abstract: We'll give an overview of some recent results on optimal L^2 extension, Demailly's strong openness conjecture about multiplier ideal sheaves and the singular vector bundle version, converse L^2 theory, Le Poiter type isomorphism theorem for the singular vector bundle, and some applications in complex algebraic geometry, complex differential geometry and partial differential equation.

Abstract

Speaker: Yohei Sakurai (Saitama University)

Title: Almost splitting and quantitative stratification for super Ricci flow

Abstract: I will discuss almost rigidity properties of super Ricci flow whose Muller quantity is non-negative. I will present almost splitting and quantitative stratification theorems that have been established by Bamler for Ricci flow. This talk is based on the joint work with Keita Kunikawa (Tokushima University).

Speaker: Jianquan Ge (Beijing Normal University)

Title: Compact submanifolds with pinched Ricci curvature

Abstract: For compact submanifolds in Euclidean and Spherical space forms with Ricci curvature bounded below by a function $\alpha(n, k, H, c)$ of mean curvature, we prove that the submanifold is either isometric to the Einstein Clifford torus, or a topological sphere for the maximal bound $\alpha(n, [\frac{n}{2}], H, c)$, or has up to k -th homology groups vanishing. This gives an almost complete (except for the differentiable sphere theorem) characterization of compact submanifolds with pinched Ricci curvature, generalizing celebrated rigidity results obtained by Ejiri, Xu-Tian, Xu-Gu, Xu-Leng-Gu, Vlachos, Dajczer-Vlachos. This is a joint work with Ya Tao and Yi Zhou.

Speaker: Reiko Miyaoka (Tohoku University)

Title: Chern's conjecture in the Dupin case

Abstract: Chern's conjecture states that a closed minimal hypersurface M in S^{n+1} with constant scalar curvature (CSC) is isoparametric. This is open when the number g of distinct principal curvatures is greater than 3, unless further conditions are imposed. Here we add a condition M is Dupin. Then the conclusion holds for a closed CMC Dupin hypersurface with $g=4$. Moreover, instead of CSC, constant Lie curvature (a Lie invariant discovered by the author) works as well. This is also true for $g=6$, and it covers all the closed Dupin cases (arXiv:2504.02621).

Abstract

Speaker: Peng Wang (Fujian Normal University)

Title: On the classification of 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. However, a complete classification in the n -sphere has remained an open problem for over three decades. In this work, we provide a complete description of all Willmore 2-spheres, classifying them into three cases:

- (1) Projection of a special class of twistor curves from the twistor bundle, satisfying an additional condition called normal-horizontal;
- (2) Strictly m -isotropic minimal surfaces in \mathbb{R}^n with planar ends;
- (3) Strictly k -isotropic Willmore 2-spheres derived via $(m-k)$ -step adjoint transforms of certain strictly m -isotropic minimal surfaces in \mathbb{R}^n . This is a joint work with Xiang Ma and Franz Pedit.

Speaker: Kefeng Liu (Chongqing University of Technology)

Title: Automorphic cohomology, the Penrose transform, and non-classical flag domains

Abstract: This talk presents joint work with Yang Shen on the geometry of non-classical flag domains. We resolve several conjectures of Griffiths concerning the structure of their automorphic cohomology. Furthermore, we construct novel complex structures on these domains and their compact quotients, yielding new examples of manifolds that admit multiple, geometrically distinct complex structures.

A central result is the construction of a Penrose-type transform for the cohomology of line bundles over these domains. We establish precise conditions for this transform to be an isomorphism on compact quotients. This enables us to demonstrate that higher-degree automorphic cohomology groups are isomorphic to spaces of automorphic forms on associated Hermitian symmetric spaces.

Abstract

Speaker: Koji Fujiwara (Kyoto University & Okinawa Institute of Science and Technology)

Title: The rates of growth in hyperbolic groups

Abstract: Let $e(G,S)$ be the exponential growth rate of a finite generated group G with a finite generating set S . Let $\xi(G)$ be the set $\{e(G,S)\}$ for all finite generating sets S of G . Sela and I proved that if G is a non-elementary hyperbolic group, then $\xi(G)$ is well-ordered. I also plan to discuss the set of growth rates for a family of groups. That is a joint work with Breuillard.

Speaker: Jiyuan Han (Westlake University)

Title: On H-minimizer of a Fano fibration

Abstract: Hamilton-Tian theorem predicts a unique limit (a shrinking soliton) of the Kähler Ricci flow defined on a Fano variety. The H-minimizer plays an important role in characterizing this limit. In a recent work by Song Sun and Junsheng Zhang, the authors show that a complete shrinking soliton is quasi-projective. This result emphasizes the importance to study shrinking solitons on Fano fibrations over affine varieties. In a joint work with Lu Qi, Minghao Miao, Linsheng Wang, Tong Zhang, we show that there exists a unique H-minimizer for a Fano fibration germ.

Speaker: Kenji Fukaya (Tsinghua University)

Title: Functoriality of Lagrangian Floer theory and its application

Abstract: Quantum cohomology and Gromov-Witten invariant is a powerful tool to study symplectic geometry. However it is known that they are not functorial. For example any reasonable notion of morphisms (except isomorphism) does not induce ring homomorphism for Quantum cohomology. On the other hand, starting with works by Wehrheim and Woodward, it is known that Lagrangian Floer theory is functorial. I want to explain which kinds of functoriality it satisfies and explain some of its applications.

Abstract

Speaker: Yong Wei (University of Science and Technology of China)

Title: Volume preserving Gauss curvature flow in hyperbolic space

Abstract: We consider the volume preserving flow of smooth, closed and convex hypersurfaces in the hyperbolic space with the speed given by arbitrary positive power of the Gauss curvature. We prove that if the initial hypersurface is convex, then the solution remains convex and exists for all positive time. Furthermore, by applying a result of Kohlmann—which characterizes the geodesic ball in terms of hyperbolic curvature measures—we show that the flow converges smoothly to a geodesic sphere. This work represents the first result for non-local volume-preserving curvature flows in hyperbolic space requiring only convexity of the initial data. We also establish a similar result for volume-preserving non-homogeneous Gauss curvature flows in hyperbolic space. This is joint work with Bo Yang (THU) and Tailong Zhou (Sichuan Univ.)

Speaker: Akito Futaki (Tsinghua University)

Title: Hodge Laplacian and geometry of Kuranishi family of Fano manifolds

Abstract: We study the geometry of Kuranishi family of deformations of Fano manifolds. We first show, using the Bochner-Kodaira formula, that the Kaehler form remains to be a Kaehler form under small deformations. We then obtain the Ricci potential formula, and study the deformations of Fano manifolds with weighted solitons. Partly based on a joint work with X.F.Sun and Y.Y.Zhang.

Speaker: Bo Liu (East China Normal University)

Title: Dai-Zhang higher spectral flow and differential K-theory

Abstract: In 1998, Dai Xianzhe and Zhang Weiping generalised the spectral flow to the family case, the so-called Dai-Zhang higher spectral flow. Recently, we find that the higher spectral flow appears naturally in the study of differential K-theory and plays an important role. In this talk we will explain the relations between the Dai-Zhang higher spectral flow and differential K-theory and discuss some further developments.

Abstract

Speaker: Yoshinori Hashimoto (Osaka Metropolitan University)

Title: Calabi's extremal metrics and non-Archimedean potentials

Abstract: The extremal metric, introduced by Calabi, is a canonical metric on a Kähler manifold which can be regarded as a generalisation of Kähler-Einstein metrics and constant scalar curvature Kähler metrics. An important problem is to find a criterion for the existence of extremal metrics on a given Kähler manifold, and a leading conjecture in this area, due to Yau, Tian, Donaldson, and Székelyhidi, states that the existence of an extremal metric can be characterised by an algebro-geometric stability condition. A breakthrough result by Li proves that the existence of a constant scalar curvature Kähler metric follows from a certain completion of this stability condition. In this talk, we generalise Li's result to extremal metrics.

Speaker: Takao Yamaguchi (University of Tsukuba)

Title: Geometry of limits of manifolds with boundary

Abstract: We consider the family of compact Riemannian manifolds with boundary having lower bounds on the sectional curvatures of interior and boundary and on the second fundamental form of boundary and an upper diameter bound. We discuss the Gromov-Hausdorff convergence in the compactification of this family as well as the local structure of the limit spaces. This is based on joint works with Zhilang Zhang (Foshan University).

Speaker: Zhichao Wang (Fudan University)

Title: Existence of embedded minimal tori in 3-sphere with positive Ricci curvature

Abstract: In this joint work with Xingzhe Li, we prove the strong Morse inequalities for the area functional in the space of embedded tori and spheres in the three sphere. As a consequence, we prove that in the three dimensional sphere with positive Ricci curvature and bumpy metrics, it contains at least 9 distinct embedded minimal tori with index 5, 6, 6, 7, 7, 7, 8, 8, 9. The proof relies on a multiplicity one theorem for the Simon-Smith min-max theory proved by myself and X. Zhou.