几何与物理研讨会会议日程

数学科学学院

2026 年 1 月 9 日-1 月 12 日

一、 会议基本信息

会议日期及地点

日期：2026 年 1 月 9—12 日，其中 9 日报到，12 日离会

报到及住宿地点：安徽饭店(合肥市蜀山区梅山路 18 号)

会议地点：中国科学技术大学第五教学楼 5101

主办单位

中国科学技术大学　数学科学学院

会议组委会

胡森　(中国科学技术大学)

王宏玉 (扬州大学)

张影　(苏州大学)

黄腾　(中国科学技术大学)

联系人

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二、会议日程安排

1 月 9 日(周五)报到			
晚餐			
1 月 10 日(周六)			
时间	**报告人**	**题目**	**主持人**
9:00-9:50	胡森	On generalized Ricci flow and four manifolds	张影
9:50-10:40	戴波	Soliton solutions of ASDYM equation on $R^{2,2}$ and its reductions	张影
休息			
11:00-11:50	池汉慈	New Spin(7) Metrics with Generic Aloff—Wallach Spaces as Principal Orbits	张影
午餐			
14:00-14:50	付海平	具有调和 Weyl 曲率张量的闭黎曼流形与第二型曲率算子	梅加强
14:50-15:40	虞维科	Prescribed Chern scalar curvatures on complete noncompact Hermitian manifolds	梅加强
休息			
16:00-16:50	周久儒	Energy functionals on almost Kähler manifolds: I	梅加强
晚餐			

1 月 11 日(周日)			
时间	**报告人**	**题目**	**主持人**
9:00-9:50	毛井	A generalized sphere theorem and its applications	朱鹏
9:50-10:40	王为为	Eigenvalue Estimate for the Rough Laplacian on 1-Forms and its Applications	朱鹏
休息			
11:00-11:50	张祖仪	Quilted Lagrangian Floer Theory on Surfaces	朱鹏
午餐			
14:00-14:50	张教根	Interpolation theory and the complex Hessian equation on compact Kahler manifolds	谈强
14:50-15:40	张攀	The Hitchin–Kobayashi correspondence and its generalizations	谈强
休息			
16:00-16:50	王朔	Special Kähler metric on the base of the $SL(2,\mathbb{C})$ Hitchin system	谈强
晚餐			
1 月 12 日(周一)离会			

三、报告题目与摘要

Speaker：胡森 (中国科学技术大学)

Title: On generalized Ricci flow and four manifolds
Abstract: The rich theories on smooth four manifolds made it hard for a geometrization proposal. The concept of generalized complex structure unified complex structure and symplectic structure. It helps us to make a systematic study on smooth four manifolds.

Speaker：戴波 (北京大学)

Title: Soliton solutions of ASDYM equation on $R^{2,2}$ and its reductions
Abstract: Many interesting integrable systems, such as $2d$, $(1+1)d$, modified $(2+1)d$ chiral models, KdV, Sine-Gorden equations, can be reduced from anti-self-dual Yang-Mills (ASDYM) equation on $R^{2,2}$. When the structure group is U(n) or SU(n), we use loop group factorization and a limiting method to construct Backlund transformations and all soliton solutions for the ASDYM equation. In some cases, our method can be chosen compactible with reductions.

Speaker: 池汉慈 (西交利物浦大学)

Title: New Spin(7) Metrics with Generic Aloff–Wallach Spaces as Principal Orbits
Abstract: In this talk, I will present new families of complete noncompact Spin(7) metrics that exhibit distinct topologies. These metrics arise as integral curves of the cohomogeneity one Ricci-flat system, with the principal orbit being a generic Aloff–Wallach space, formulated as a dynamical system

on an algebraic surface. By constructing an invariant subset in the compactified phase space, we prove the existence of one-parameter families of ALC Spin(7) metrics which, in the limit, converge to AC metrics. The existence of such topologically distinct resolutions of a single Spin(7) cone has both mathematical and physical significance.

Speaker：付海平 (南昌大学)

Title: 具有调和 Weyl 曲率张量的闭黎曼流形与第二型曲率算子
Abstract: 首先, 在爱因斯坦流形上给出 Bochner 公式, 即由第二型曲率算子的特征张量和特征值来表达 $\langle \Delta R, R\rangle$. 基于此, 证明了具有 $k(\max\{4, \left[\frac{n+2}{4}\right]\})$-非负第二型曲率算子的闭爱因斯坦流形是常曲率空间, 这拓广了 Cao-Gursky-Tran 和 Li 这方面的结果. 其次, 基于前面的结果, 给出了具有调和 Weyl 张量和非负第二型曲率算子的黎曼流形的分类定理. 这拓广了 Kashiwada 的结果.

Speaker：虞维科 (南京师范大学)

Title: Prescribed Chern scalar curvatures on complete noncompact Hermitian manifolds
Abstract: In this talk, we investigate the problem of prescribing Chern scalar curvatures on complete Hermitian manifolds. Firstly, we will review the prescribed Chern scalar curvature problem on Hermitian manifolds. Secondly, we study this problem on complete noncompact Hermitian manifolds, and generalize the Aviles-McOwen' s existence results [J. Differential Geom., 21 (1985): 269-281] from Poincare disks to higher dimensional Hermitian manifolds.

Speaker：周久儒 (扬州大学)

Title: Energy functionals on almost Kähler manifolds: I
Abstract: In this talk, we consider the Donaldson gauge functional and the twisted Aubin functionals on almost Kähler manifolds. As in Kähler geometry, we generalize the inequality between Aubin functionals. This is a joint work with Ken Wang and Zuyi Zhang.

Speaker：毛井 (湖北大学)

Title:A generalized sphere theorem and its applications
Abstract: In this talk, we will introduce a generalized sphere theorem for compact Riemannian manifolds with radial Ricci curvature bounded, which is based on a recent work of mine.

Speaker：王为为 (电子科技大学)

Title: Eigenvalue Estimate for the Rough Laplacian on 1-Forms and its Applications
Abstract: In this talk, we will establish a geometric lower bound for the first positive eigenvalue of the rough Laplacian acting on 1-forms for closed $2n$-dimensional Riemannian manifolds with nonvanishing Euler characteristic. In contrast to the case of functions, such a Li-Yau-type estimate does not hold in general, as evidenced by existing counterexamples. As applications, we derive vanishing results for the Euler characteristic under certain Ricci curvature bounds and the presence of a nonzero Killing vector field, extending classical Bochner-type theorems. This is a joint work with T. Huang.

Speaker：张祖仪 (北京大学)

Title: Quilted Lagrangian Floer Theory on Surfaces
Abstract: In this talk, I will provide a way to calculate quilted Lagrangian Floer theory when the symplectic manifolds are closed real 2-dimensional surfaces.I will start with the definitions of Lagrangian Floer theory and give a potential application on knot theory. After that, I will introduce the main theorem and using this to do calculations on examples. If time is allowed, a sketch of the proof of the main theorem will be given.

Speaker：张教根 (合肥工业大学)

Title: Interpolation theory and the complex Hessian equation on compact Kähler manifolds

Abstract: The complex Hessian equation is a cornerstone of complex geometry and several complex variables. In this talk, we revisit its analysis on compact Kähler manifolds. Specifically, we demonstrate that under a constraint involving the bisectional curvature and the solution's oscillation, the Laplacian estimate can be linearly controlled by the corresponding gradient estimate. This pivotal finding enables us to establish the gradient estimate via a standard interpolation argument, thereby bypassing the need for the blow-up technique.

Speaker：张攀 (安徽大学)

Title: The Hitchin–Kobayashi correspondence and its generalizations
Abstract: In this talk, we will explore the history, recent advances, and applications of the Hitchin-Kobayashi correspondence.

Speaker：王朔 (中国科学技术大学)

Title: Special Kähler metric on the base of the $\mathrm{SL}(2,\mathbb{C})$ Hitchin system
Abstract: Freed and Hitchin showed that the regular locus of the base of the $\mathrm{SL}(2,\mathbb{C})$ Hitchin system carries a canonical special Kähler structure, and that the associated metric becomes singular near the discriminant locus. In 2017, Baraglia and Huang computed the Taylor expansion of this metric. In 2019, Hitchin constructed a family of subsystems associated with components of the discriminant locus whose spectral curves have only ordinary singular points; these components form smooth strata, each inheriting a special Kähler structure.

In this talk, I will present joint work with Zhenxi Huang and Bin Xu on the asymptotic behavior of the canonical special Kähler metric near such a stratum. For each stratum, we show that the metric exhibits a logarithmic singularity, while its convergent component limits to a well-defined metric on the stratum itself. We prove that this limiting metric coincides precisely with the special Kähler metric arising from Hitchin' s subsystems. Moreover, along any complex line through a point of the stratum, the limiting metric has a conical singularity at the origin.