复旦大学 数学科学学院
School of Mathematical Sciences, Fudan University

复旦大学 应用数学中心
CENTER FOR APPLIED MATHEMATICS FUDAN UNIVERSITY

上海数学中心
SHANGHAI CENTER FOR
MATHEMATICAL SCIENCES

第34届长江偏微分方程会议

会议手册

复旦大学数学科学学院、复旦大学应用数学中心、上海数学中心

2026年8月21日-8月24日

会议信息

1、概况

长江偏微分方程会议历史悠久，前身为“长三角偏微分方程会议”，由谷超豪、李大潜、董光昌、姜礼尚、陈恕行、仇庆久等老一辈数学家共同倡导，于 1991 年首次在复旦大学举办。本次会议邀请国内外相关领域专家学者围绕偏微分方程及其相关方向的最新研究进展开展学术交流。

本届会议将于 2026 年 8 月 21 日至 24 日在复旦大学举行，由复旦大学数学科学学院、复旦大学应用数学中心、上海数学中心共同承办。会议地点在复旦大学邯郸校区（邯郸路 220 号），会议报到时间是 8 月 21 日或 22 日。本次会议分成两个部分：8 月 22 日长江偏微分方程青年论坛，8 月 23 日 -24 日长江偏微分方程会议。

2、会议组织委员会

雷震、周忆、林治武、Mikhail Korobkov、华波波、张永前、王利彬、王志强、吴昊、曲鹏、黄耿耿、蔡圆、王玥、任潇

3、承办单位

复旦大学数学科学学院、复旦大学应用数学中心、上海数学中心

4、会议日程安排

8 月 21 日 -8 月 22 日（周五至周六）报到

入住酒店：Pagoda 君亭设计酒店（上海五角场复旦大学店 - 杨浦区政学路 77 号）或上海五角场美壹酒店（复旦大学管理学院店，杨浦区伟德路 6 号）。

8 月 22 日（周六）长江偏微分方程青年论坛

地点：复旦大学邯郸校区（邯郸路 220 号）

8 月 23 日 -8 月 24 日（周日至周一）长江偏微分方程会议

地点：复旦大学邯郸校区（邯郸路 220 号）

5、会议费用

本次会议收取会议注册费 1000 元 / 人。会议期间住宿统一安排，住宿费用自理。

6、住宿交通信息

本次会议住宿地点为 Pagoda 君亭设计酒店（上海五角场复旦大学店－杨浦区政学路 77 号）或上海五角场美壹酒店（复旦大学管理学院店，杨浦区伟德路 6 号），两处相距 300 米，均可乘坐公共交通地铁 10 号线至江湾体育场站，步行约 300 或 400 米到达。酒店距主要的交通枢纽：上海站 13 公里车程约 35 分钟，上海虹桥站、虹桥机场 26 公里车程约 40 分钟，浦东机场 46 公里车程约 50 分钟。

交通指南

7、会议期间接驳大巴运行计划：

1)22 日早 8:00 大巴从君亭酒店、美壹酒店出发前往光华楼会场。

2)22 日午餐后大巴 13:00 从光华楼下出发前往酒店；14:10 从君亭酒店、美壹酒店出发前往光华楼会场。

3)22 日下午会后大巴 18:00 从光华楼下出发前往酒店。

4)23 日早 8:30 大巴从君亭酒店、美壹酒店出发前往会场。

5)23 日午餐后大巴 13:00 从正大餐厅门口出发前往酒店；14:10 从君亭酒店、美壹酒店出发前往光华楼会场。

6)23 日晚餐后大巴 20:00 从皇冠餐厅门口出发前往酒店。

7)24 日早 8:00 大巴从君亭酒店、美壹酒店出发前往光华楼会场。

8)24 日午餐后大巴 13:00 从光华楼下出发前往酒店。

日程安排

2026 年第 34 届长江偏微分方程会议

日期	日程	地点
8 月 21 日下午	会议注册	美壹酒店大厅
8 月 22 日全天	青年学者论坛	椭圆抛物方程分会场：光华东主楼 2001 室 双曲数学物理分会场：光华东主楼 2201 室
	会议注册	上午：光华东主楼 22 楼 下午、晚上：君亭酒店、美壹酒店大厅
8 月 23 日上午	大会报告	光华东辅楼 102 室
8 月 23 日下午 8 月 24 日上午	分组报告	椭圆方程分会场：光华东主楼 2001 室 抛物方程分会场：光华东主楼 2201 室 双曲方程分会场：光华东辅楼 103 室 数学物理分会场：光华东主楼 1801 室
8 月 24 日下午	自由讨论	光华东主楼 1801 室 君亭酒店、美壹酒店

8 月 22 日 长江偏微分方程青年论坛

椭圆抛物方程分会场

8 月 22 日（周六）

地点：光华楼东主楼 20 楼 2001 室

时间	报告人	报告题目	主持人
08:30–09:00	张驰麟	Classification of global solutions to the singular equation $-\Delta u=f(X)\cdot u^{-\gamma}$ in a Lipschitz cone	周　风
09:00–09:30	谢炯铎	Solutions of the singular Yamabe problem near singular boundaries	
09:30–10:00	王　斌	Hypersurfaces of constant curvature in hyperbolic space with prescribed asymptotic boundary at infinity	
10:00–10:25	茶歇：光华楼东主楼 22 楼		
10:25–10:55	何静宁	Well-posedness and long-time behavior of a Navier-Stokes-Cahn-Hilliard system with chemotaxis and singular potential	周焕松
10:55–11:25	杨　帆	Large-time behavior of solutions to the 3D incompressible active nematic model	
11:25–11:55	毛　宣	Finite-time blow-up in a Keller-Segel model with indirect signal production	
12:00–13:00	午餐：旦苑餐厅三楼		
14:30–15:00	边行之	A brief introduction to a class of new phase field model	陈传强
15:00–15:30	李庚霖	Analysis of subcritical-mass solutions to a doubly degenerate chemotaxis system with signal production	
15:30–16:00	刘　萌	A note on the 8π problem of Jäger-Luckhaus system	
16:00–16:25	茶歇：光华楼东主楼 22 楼		
16:25–16:55	梅新群	Prescribed area measure problem of convex capillary hypersurfaces in half Euclidean space	陈洪葛
16:55–17:25	雷雅婷	The Christoffel-Minkowski type problem in hyperbolic space	
17:25–17:55	贾皓皓	The interior curvature bounds of prescribing scalar curvature equations in Minkowski space	
17:30–20:30	晚餐：君亭设计酒店四楼中餐厅		

双曲数学物理分会场

8 月 22 日（周六）

地点：光华楼东主楼 22 楼 2201 室

时间	报告人	报告题目	主持人
08:30–09:00	曾梓镕	Dissipative solutions of the 3D Navier-Stokes equations	张挺
09:00–09:30	李圣鑫	Structural stability of Prandtl boundary layers in the entire subsonic regime	
09:30–10:00	毛顺凯	The null condition in elastodynamics leads to non-uniqueness	
10:00–10:25	茶歇：光华楼东主楼 22 楼		
10:25–10:55	徐淑芳	Stability of viscous shock waves for Burgers equation with double singularities in the flux and viscosity	徐江
10:55–11:25	陈　志	Sharp decay characterization for the incompressible Oldroyd-B model in critical L^p spaces	
11:25–11:55	王　宇	Carleman-based iterative regularization for an inverse source problem in stochastic hyperbolic equations	
12:00–13:00	午餐：旦苑餐厅三楼		
14:30–15:00	杨依灵	Long time asymptotic analysis for some integrable equations	黎泽
15:00–15:30	王兆钰	A dense focusing Ablowitz-Ladik soliton gas and its asymptotics	
15:30–16:00	孙　暄	Elliptic-rogue waves and modulational instability in nonlinear soliton equations	
16:00–16:25	茶歇：光华楼东主楼 22 楼		
16:25–16:55	何　程	Asymptotic stability of peakons for the Camassa-Holm equation on the half-line	刘成杰
16:55–17:25	肖　婷	Existence of steady supersonic Euler flows past two-dimensional divergent nozzles	
17:25–17:55	高　普	Global dynamics of global classical solution to radially symmetric unsteady flows with nonzero angular velocity in an annulus	
17:30–20:30	晚餐：君亭设计酒店四楼中餐厅		

8 月 23 日 –24 日 长江偏微分方程会议

主会场大会报告

8 月 23 日（周日）上午

地点：光华楼东辅楼 1 楼 102 室

时间	会议内容
09:00–09:30	开幕式
09:30–10:20	大会报告：汪徐家（西湖大学） 标题：First boundary value problem for affine maximal surface equation
10:20–10:50	合影、茶歇
10:50–11:40	大会报告：李从明（上海交通大学） 标题：On the qualitative analysis of nonlocal problems from geometry and functional analysis
12:00–13:00	午餐：正大餐厅一楼

椭圆方程分会场

8 月 23 日（周日）下午、24 日（周一）上午

地点：光华楼东主楼 20 楼 2001 室

8 月 23 日（周日）下午

时间 23 日	报告人	报告题目	主持人
14:30–15:00	蒋飞达	On a class of Cauchy problems with applications in nonlinear PDEs	杨孝平
15:00–15:30	王　奎	Fundamental gaps and power log-concavity: From heat kernels to Dirichlet ground states	
15:30–16:00	韦　韡	A Yamabe problem for the quotient between the Q curvature and the scalar curvature	
16:00–16:25	茶歇：光华楼东主楼 22 楼		
16:25–16:55	罗　鹏	Quantitative analysis of positive solutions to the Lane-Emden problem in dimension two	王克磊
16:55–17:25	李沁峰	Stability of Serrin overdetermined problem	
17:25–17:55	罗森平	A naive thought on minimum principle and applications to phase transitions in crystals	
18:00–20:00	晚宴：皇冠大宴会厅二楼		

24 日（周一）上午

时间	报告人	报告题目	主持人
08:30–09:00	黄　侠	Asymptotically sharp Hardy-Rellich inequalities on lattices	敖微微
09:00–09:30	李俊钢	复双曲空间的若干方程问题	
09:30–10:00	张霜剑	The geometry of nonlinear pricing: convexity of indirect utilities as a curvature condition	
10:00–10:25	茶歇：光华楼东主楼 22 楼		
10:25–10:55	熊昌伟	On Liouville problems for (p, q)-Laplacian inequalities on Finsler measure spaces	鲁建
10:55–11:25	邓　斌	Noncompactness for the σ_2 Yamabe equation	
11:25–11:55	吴　天	几类复流形上几何不等式的最佳常数问题	
12:00–13:00	午餐：旦苑餐厅三楼		

抛物方程分会场

8 月 23 日（周日）下午、24 日（周一）上午

地点：光华楼东主楼 22 楼 2201 室

8 月 23 日（周日）下午

时间	报告人	报告题目	主持人
14:30–15:00	穆春来	Blow-up in a flux-limited chemotaxis system	娄本东
15:00–15:30	梁　兴	两尺度非均衡介质中 KPP 方程时空动力学	
15:30–16:00	郭宏骏	Reaction-diffusion equations in periodic media: convergence to pulsating fronts	
16:00–16:25	茶歇：光华楼东主楼 22 楼		
16:25–16:55	孙春友	Inertial form and its smoothness for the Burgers equation	钮维生
16:55–17:25	王小六	The evolution of convex curves under anisotropic inverse curvature flows	
17:25–17:55	张艳艳	Analytic description of the moving moisture front in soils	
18:00–20:00	晚宴：皇冠大宴会厅二楼		

24 日（周一）上午

时间	报告人	报告题目	主持人
08:30–09:00	向昭银	Global solvability of a chemotaxis system with chemokine production-consumption kinetics	郑攀
09:00–09:30	周一夫	Collapsing-tube formation for the cubic semilinear heat equation	
09:30–10:00	李　芳	Propagation dynamics in degenerate diffusion equations with multistable reactions	
10:00–10:25	茶歇：光华楼东主楼 22 楼		
10:25–10:55	王良晨	Global solvability and eventual smoothness in degenerate chemotaxis-consumption systems	曹欣茹
10:55–11:25	谢　莉	Research progress on urban crime models with singular sensitivity	
11:25–11:55	李　燕	On a Chemotaxis-May-Nowak Model for virus infection with superlinear dampening	
12:00–13:00	午餐：旦苑餐厅三楼		

双曲方程分会场

8 月 23 日（周日）下午、24 日（周一）上午

地点：光华楼东辅楼 1 楼 103 室

8 月 23 日（周日）下午

时间	报告人	报告题目	主持人
14:30–15:00	费明稳	Sharp interface limit of the 3D Navier-Stokes / Allen-Cahn system	王亚光
15:00–15:30	朱圣国	Global classical solutions of the multi-dimensional degenerate compressible Navier-Stokes equations with large data of spherical symmetry	
15:30–16:00	吕博强	Global classical solutions to the full compressible Navier-Stokes equation with slip boundary conditions	
16:00–16:25	茶歇：光华楼东辅楼		
16:25–16:55	邓师瑾	Pointwise structures and background perturbation analysis for thermal non-equilibrium irrotational flows in three space dimensions	吕勇
16:55–17:25	李思然	Existence of global $W^{2,p}$-isometric immersions for negatively curved surface metrics with unbounded second fundamental form	
17:25–17:55	章俊彦	The incompressible limit of free-surface inviscid fluids	
18:00–20:00	晚宴：皇冠大宴会厅二楼		

24 日（周一）上午

时间	报告人	报告题目	主持人
08:30–09:00	顾旭旻	Low Mach number limit of the free boundary problem for the Euler-Fourier system	许刚
09:00–09:30	高　宸	Long-time dynamics and nonlinear stability of semi-similar Prandtl flows	
09:30–10:00	赖宁安	Morawetz type estimates for wave/Schrödinger equations and its applications	
10:00–10:25	茶歇：光华楼东辅楼		
10:25–10:55	朱　异	Global existence and stability of solutions for the 2D non-resistive compressible MHD system	王云
10:55–11:25	高俊磊	Structural stability of transonic shocks and mixed boundary value problems of nonlocally strongly coupled elliptic-hyperbolic equations	
11:25–11:55	丁冰冰	Global existence and blow-up for 2D quasilinear waves with higher-order null conditions	
12:00–13:00	午餐：旦苑餐厅三楼		

数学物理分会场

8 月 23 日（周日）下午、24 日（周一）上午

地点：光华楼东主楼 18 楼 1801 室

8 月 23 日（周日）下午

时间	报告人	报告题目	主持人
14:30–15:00	吴奕飞	Long-time error growth in Strang splitting method for the nonlinear Schrodinger equation	范恩贵
15:00–15:30	张　登	Stochastic Zakharov system: well-posedness theory and noise-regularization effect	
15:30–16:00	徐霄乾	AI proofs in PDEs	
16:00–16:25	茶歇：光华楼东主楼 22 楼		
16:25–16:55	王　伟	Asymptotic behavior of energy for N-interacting 2D particles on the real line	李景
16:55–17:25	沈舜麟	On the mean-field and semiclassical limit from quantum N-body dynamics	
17:25–17:55	张华丽	Low regularity well-posedness for compressible Euler equations with vorticity	
18:00–20:00	晚宴：皇冠大宴会厅二楼		

24 日（周一）上午

时间 24 日	报告人	报告题目	主持人
08:30–09:00	虞国富	The trigonometric-type three-field Blaszak-Marciniak lattice equation	张大军
09:00–09:30	田守富	On Cauchy problem to the modified Camassa-Holm equation: Painlevé asymptotics	
09:30–10:00	凌黎明	Orbital stability of finite-gap solutions for nonlinear Schrödinger equation	
10:00–10:25	茶歇：光华楼东主楼 22 楼		
10:25–10:55	何孝凯	Newman-Penrose 框架及其在广义相对论中的应用	谢纳庆
10:55–11:25	张　林	On the strong cosmic censorship in general relativity	
11:25–11:55	臧云龙	Global existence for general nonlinear Dirac equations via hidden spinorial null structure	
12:00–13:00	午餐：旦苑餐厅三楼		

报告题目与摘要

大会报告

李从明（上海交通大学）

题目：On the qualitative analysis of nonlocal problems from geometry and functional analysis

摘要： We give a brief introduction to the qualitative analysis of nonlinear problems arising from geometry and functional analysis. Our focus is on the research work of our team concerning various maximum principles, Liouville-type theorems, the method of moving planes, and the classification of solutions. The main equations under consideration are Hardy-Littlewood-Sobolev type systems and curvature-related geometric equations. We also review recent progress in the analysis of nonlocal problems, with particular emphasis on those involving the fractional Laplacian. In addition, we discuss related results on a priori estimates and regularity theory.

汪徐家（西湖大学）

题目：First boundary value problem for affine maximal surface equation

摘要： In this talk, we discuss the interior regularity of solutions to the first boundary value problem for the affine maximal surface equation. This equation arises as the Euler-Lagrange equation of the affine volume functional. It is a fourth-order PDE, can be formulated as a system of two second-order PDEs, one is the linearized Monge-Ampere equation and the other one is the standard Monge-Ampere equation. The study of the affine maximal surface equation is closely connected to the theory of the Monge-Ampere equation.

椭圆分会场

邓斌（武汉大学）

题目：Noncompactness for the σ_2 Yamabe equation

摘要： For every integer n≥27, we construct a smooth metric on $\mathbb{S}^n$ that is invariant under the antipodal map and is not locally conformally flat. For this fixed background metric, the normalized σ_2-Yamabe equation admits a noncompact family of positive Γ_2^+-admissible solutions. The main difficulty is the possible loss of ellipticity of the linearized operator. This difficulty does not occur for the scalar Yamabe equation, whose linearization has a fixed Laplace-type principal part. In the σ_2 problem, the positive Newton tensor of a standard bubble decays in the far field, while the terms produced by the background metric need not decay at the same rate. Our construction provides the relative decay needed to keep the conformal metrics inside the ellipticity cone. A quartic profile in the finite-dimensional reduction yields the endpoint dimension n=27. This is a work joint with Han Lu and Juncheng Wei.

黄侠（华东师范大学）

题目：Asymptotically sharp Hardy-Rellich inequalities on lattices

摘 要： In this talk, I will talk about the sharp asymptotic behavior of the optimal constants in the discrete Hardy-Rellich inequalities on the lattice Z^d. For every fixed integer m≥1, let $C_{m,d}$ be the best constant in the m-th order Hardy-Rellich inequality. We prove that

$$\lim_{d\to\infty} \frac{C_{m,d}}{d^m} = 2^m.$$

Our approach combines a Fourier reduction to weighted inequalities with the flat torus and general weighted Hardy-Rellich identities of first and second order. A key novelty is the use of probabilistic concentration estimates, specifically Hoeffding's inequality and entropy methods, to handle estimates involving the anisotropic weight ω^γ $(\gamma \geq 1)$ where $\omega(x) = \sum_{j=1}^{d} (\sin\frac{x_j}{2})^2$ in a dimension-uniform manner. These tools yield asymptotically sharp weighted estimates on the torus, from which the lattice inequalities follow by iteration. This is a joint work with Professor Dong YE at ECNU.

蒋飞达（东南大学）

题目：On a class of Cauchy problems with applications in nonlinear PDEs

摘要： In this talk, we discuss the existence and nonexistence of entire solutions to a general class of Cauchy problems. Our results provide a unified approach to proving Keller-Osserman type results for nonlinear PDEs in Euclidean space. This talk is based on a joint work with Neil S. Trudinger and Qiao-Qiao Xu.

李俊钢（中国科学技术大学）

题目：复双曲空间的若干方程问题

摘要： 报告聚焦于复双曲空间上临界半线性方程。不同于实双曲空间，复双曲空间具有独特的 Heisenberg 代数结构，因而其上的半线性方程的处理方式跟实情形非常不同。我们将讨论非交换情形下的方程解的存在性、稳定性与若干分类结果。

李沁峰（湖南大学）

题目：Stability of Serrin overdetermined problem

摘要： In my earlier work with Weihong Xie and Hang Yang, we posed a stability question for Serrin's overdetermined problem under Dirichlet perturbations and proved that the answer is negative in dimensions $n\geq 3$. The present talk resolves the question in the planar convex class and develops a sharp quantitative theory without any a priori geometric nondegeneracy and smoothness assumption. The convexity assumption cannot be removed.

罗鹏（华中师范大学）

题目：Quantitative analysis of positive solutions to the Lane-Emden problem in dimension two

摘 要： In this talk, we are concerned with the well-known Lane-Emden problem. Improving some known asymptotic estimates on the solutions, we prove the non-degeneracy and local uniqueness of the multi-spikes positive solutions for general domains. Our methods mainly use ODE's theory, various local Pohozaev identities, blow-up analysis, morse index, topological degree and the properties of Green's function. This is jointed with Isabella Ianni, Shusen Yan.

罗森平（江西师范大学）

题目：A naive thought on minimum principle and applications to phase transitions in crystals.

摘要：In teaching undergraduate PDE and exploration of modular invariant functions, we have a naive thought on minimum principle. It turns out that: the naive thought works well in modular invariant functions, and it has useful applications in phase transitions in crystals.

王奎（苏州大学）

题目：Fundamental gaps and power log-concavity: From heat kernels to Dirichlet ground states

摘　要：This talk addresses the log-concavity of Dirichlet heat kernels and ground states for the Ornstein-Uhlenbeck operator. We present a sharp two-point gradient estimate for Gaussian Dirichlet heat kernels on convex domains, which yields ground-state log-concavity comparisons and a sharp fundamental gap lower bound via the one-dimensional model. We further explore power log-concavity of Dirichlet ground states. This talk is based on joint works with J. Sun (2025) and L. Qin & J. Sun (2026).

韦韡（南京大学）

题目：A Yamabe problem for the quotient between the Q curvature and the scalar curvature

摘要：In this talk we introduce the following Yamabe problem for the quotient between the Q curvature and the scalar curvature R: Find a conformal metric g in a given conformal class $[g_0]$ with Q_g/R_g=const. We give the existence and non-compactness results for this equation. These are joint works with Yuxin Ge, Guofang Wang, Caiyan Li.

吴天（中国科学技术大学）

题目：几类复流形上几何不等式的最佳常数问题

摘要：几何不等式的极值函数与最佳常数是非线性分析、共形几何中广为关注的问题，通过变分法，该问题可以约化为偏微分方程解的分类。我们发展了微分恒等式方法与不变张量技术，据此：

1. 得到闭的拟 Hermitian 流形上二阶次临界指标方程的 Liouville 定理，这解决了王晓东 [Math. Z., 2022] 的猜想，并将 Frank-Lieb [Ann. Math., 2012] 建立在 CR 球面上的 Folland-Stein 不等式推广到了一般拟 Hermitian 流形上。

2. 建立 Heisenberg 群上 CR-Yamabe 方程所有具有六阶导数的正定微分恒等式，这回答了 Jerison-Lee [J. Amer. Math. Soc., 1988] 的公开问题，并简化了 Ma-Ou [Adv. Math., 2023] 关于次临界指标方程

Liouville 定理的证明。

3. 通过结合 Laplace 算子的谱信息，我们得到闭 Kähler 流形上一类的一类二阶半线性方程的 Liouville 定理，这完全提升了 Licois-Véron[C. R. Acad. Sci. Paris Sér. I Math., 1995] 的 Riemann 流形版本对应结果。作为应用，我们证明了一个更优 Kähler 流形的直径比较定理。

以上工作中，1、2 是和麻希南、欧乾忠合作完成的，3 是和 Chakraborty、王晓东合作完成的。

熊昌伟（四川大学）

题目：On Liouville problems for (p, q)-Laplacian inequalities on Finsler measure spaces

摘要： In this talk we discuss the Liouville property for nonnegative weak solutions of the (p, q)-Laplacian elliptic differential inequality

$$\Delta mpux+\Delta mqux+V(x)us(x)\leq 0$$

and the associated parabolic differential inequality

$$\partial tu(x,t)\geq \Delta mpux,\ t+\Delta mqux,\ t+V(x,\ t)us(x,\ t)$$

on a forward geodesically complete noncompact Finsler measure space (M, F, m) with finite reversibility. Under several sets of integral growth conditions on the positive potential function over certain annular domains, we show that any nonnegative weak solution vanishes almost everywhere. The proofs of our results are essentially based on the nonlinear capacity method. This is a joint work with Tiancheng Wang and Dongjie Zhao.

张霜剑（复旦大学）

题目：The geometry of nonlinear pricing: convexity of indirect utilities as a curvature condition

摘 要： The monopolist's nonlinear pricing problem with agents whose preferences need not be quasilinear in price leads to G-convex indirect utilities, where the generating function G couples agent type, product, and price. McCann and Zhang (Comm. Pure Appl. Math., 2019) identified a condition (G3) — convexity of the utility along so-called G-segments — as necessary and sufficient for the set of G-convex functions to be convex, so that the principal maximizes over a convex set; they also re-expressed (G3) as a fourth-order differential inequality in the spirit of Ma-Trudinger-Wang. This talk presents the geometry behind that inequality, a pseudo-Riemannian metric of split signature on the augmented product space, extending the optimal-transport geometry of Kim and McCann. In the quasilinear case the geometry collapses onto Kim-McCann's and the condition specializes to the Figalli-Kim-McCann condition (B3). Based on joint work with Robert J. McCann (Toronto).

抛物分会场

郭宏骏（同济大学）

题目：Reaction-diffusion equations in periodic media: convergence to pulsating fronts

摘要： This talk is concerned with reaction-diffusion-advection equations in spatially periodic media. Under an assumption of weak stability of the constant states 0 and 1, and of existence of pulsating traveling fronts connecting them, we show that fronts' profiles appear, along sequences of times and points, in the large-time dynamics of the solutions of the Cauchy problem, whether their initial supports are bounded or unbounded. The types of equations that fit into our assumptions are the combustion and the bistable ones. We also show a generalized Freidlin-Gartner formula and other geometrical properties of the asymptotic invasion shapes, or spreading sets, of invading solutions, and we relate these sets to the upper level sets of the solutions. This talk is based on the joint work with F. Hamel and L. Rossi.

李芳（上海师范大学）

题目：Propagation dynamics in degenerate diffusion equations with multistable reactions

摘要： Degenerate diffusion equations provide mathematical models for various biological and physical processes where diffusion depends on the density and propagation occurs with finite speed. In this talk, I will present recent results on the long-time dynamics of a generalized degenerate diffusion equation with a multistable reaction. We establish a trichotomy for solutions arising from compactly supported initial data, identifying three possible asymptotic behaviors: small spreading, transition, and big spreading. To describe the propagation mechanism, we construct both classical traveling waves and sharp traveling waves with free boundaries satisfying Darcy's law, and show how these waves characterize the asymptotic profiles of spreading solutions. The analysis relies on generalized convergence theory for degenerate diffusion equations, comparison arguments, and phase-plane techniques.

李燕（南京邮电大学）

题目：On a Chemotaxis-May-Nowak Model for virus infection with superlinear dampening

摘要： In this talk, a three-component reaction-diffusion system originating from the classical May-Nowak model for viral infection is considered in a smoothly bounded domain $\Omega\subset R^n(n\geq 1)$. It is shown that for any suitably regular non-negative initial data and arbitrary superlinear dampening, the associated no-flux type initial-boundary value problem possesses at least one globally defined solution in an appropriate generalized sense. In addition, we prove that the corresponding generalized solution asymptotically enjoys relaxation by approaching the nontrivial homogeneous steady states in the large time limit.

梁兴（中国科学技术大学）

题目：两尺度非均衡介质中 KPP 方程时空动力学

摘要： KPP 方程时空动力学可以由线性化椭圆算子在指数加权空间中的主特征值问题确定。在非均衡介质中，经典意义下的主特征值可能不存在。但利用 Berestycki-Nirenberg-Varahan 的广义主特征值定义和 Lions-Souganidis 的 H-J 方法仍然可以研究相应 KPP 方程的时空动力学。在此基础上，我们研究了两尺度介质中的问题，其中包含一个不变尺度和一个变化尺度。我们利用 H-J 方法，研究了变化尺度趋于 0 和趋于无穷时的渐进极限。这一工作用完全不同方法推广了 Hamel 等在周期介质中的工作。

穆春来（重庆大学）

题目：Blow-up in a flux-limited chemotaxis system

摘要： This talk investigates the finite-time blow-up and infinite-time blow-up properties of solutions to a flux-limited chemotaxis model under different conditions. This is a joint work with Xinyu Tu and Minghua Zhang.

孙春友（东华大学）

题目：Inertial form and its smoothness for the Burgers equation

摘要： In this talk, I will report our recent results about the inertial form of the Burgers equation, and will focus on its C^n-smoothness for any $n=1,2,\cdots$, thereby showing that its long-time dynamics can be completely described by an explicit system of smooth first-order ODEs.

王良晨（重庆邮电大学）

题目：Global solvability and eventual smoothness in degenerate chemotaxis- consumption systems

摘要： In this talk, we consider a chemotaxis-consumption system with degenerate signal-dependent diffusion and logistic growth. The main difficulty lies in the possible vanishing of diffusivity at low signal concentrations, a degeneracy that obstructs classical solvability. By constructing novel time-dependent energy functionals, we establish global classical solutions in arbitrary dimensions under either superquadratic degradation or sufficiently strong logistic damping. For the quadratic degradation case, we obtain global weak solutions for all ranges of motility degeneracy; moreover, in the strongly degenerate regime, we prove that these weak solutions eventually become smooth and classical. Our results provide the first rigorous theory of global existence and eventual regularity for such degenerate migration-consumption models in a general setting.

王小六（东南大学）

题目：The evolution of convex curves under anisotropic inverse curvature flows

摘要： In this talk, we discuss the evolution of convex curves under the anisotropic inverse curvature flow with an area-preserving constraint or a length-preserving constraint. Assuming the global existence of the flows, we can show that they converge to Wulff shapes as time tends to infinity. The key step in the proof is establishing a time-independent upper bound for the radius of curvature, where we employ the maximum principle argument and the Moser iteration technique. We also present an example of an initial curve such that the length-preserving anisotropic inverse curvature flow develops a singularity in finite time.

向昭银（电子科技大学）

题目：Global solvability of a chemotaxis system with chemokine production- consumption kinetics

摘要： In this talk, we investigate a fully parabolic three-species chemotaxis system modeling activator-inhibitor T-cell dynamics with concurrent chemokine production and consumption. In a smooth bounded convex domain $\Omega \subset \mathbb{R}^N$ (N=1,2), and in the absence of quadratic self-limitation, we establish the global-in-time existence of unique non-negative classical solutions. The analysis reveals a regularizing mechanism induced by the concurrent production-consumption kinetics.

谢莉（重庆师范大学）

题目：Research progress on urban crime models with singular sensitivity

摘要： This report presents partial research achievements concerning the generalized solvability, eventual smoothness, and long-time behavior of urban crime models with singular sensitivity, with a particular emphasis on the latest progress under the nonlinear diffusion framework. By adopting an innovative bootstrap argument, we establish a key theoretical result: the initial-boundary value problem defined on a smoothly bounded domain $\Omega \subset R$ with $n \geq 2$ admits a global and bounded weak solution when the nonlinear diffusion exponent satisfies $m > 1+n/4$. This finding generalizes the results in two-dimensional setting established by Rodriguez and Winkler in Math. Models Methods Appl. Sci. (2020) to arbitrary high-dimensional scenarios. In addition, under reasonable supplementary assumptions on source functions, we further analyze the long-time asymptotic behavior of weak solutions. These works are completed in collaboration with Professor Bin Li from Ningbo University of Technology.

张艳艳（华东师范大学）

题目：Analytic description of the moving moisture front in soils

摘要： 我们研究退化 Richards 方程描述的土壤湿润锋传播问题。初始时刻局部湿润的土壤中，水分在重力和毛细力的共同作用下形成具有清晰锋面的湿润区域。我们通过构造行波上解并取包络的方法，严格证明了湿锋传播的各向异性上界：侧向锋面至多按时间的平方根扩散，向下锋面至多按时间线性增长，而向上锋面始终保持有界。进一步，我们以反映土壤水分扩散与储水能力比值的函数的全局下界为判据，揭示了向上锋面的二分性行为：若该下界为正，向上锋面在有限时间后反转向下；若为零，则向上锋面永不反转，仅无限逼近其最大高度。这一判据将土壤微观水力参数与宏观湿润形态直接关联，为灌溉和入渗问题提供了理论依据。基于所提出模型的数值模拟验证了理论预测，所得结果与实验观测高度吻合。本报告基于与 Bettina Detmann、Chiara Gavioli 和 Pavel Krejčí 的合作工作。

周一夫（武汉大学）

题目：Collapsing-tube formation for the cubic semilinear heat equation

摘要： In this talk, we consider the semilinear heat equation with cubic power nonlinearity $u_t = \Delta u + u^3$ in the energy-supercritical dimensions $n \geq 5$. We present a new anisotropic type II blow-up mechanism via a collapsing thin-tube: the solution concentrates around a thin tubular neighborhood of a collapsing $(n-4)$-dimensional sphere whose radius shrinks at the parabolic scale $\sqrt{T-t}$, while the transverse thickness evolves at the much smaller type II scale $\frac{T-t}{|\log(T-t)|^{\frac{n}{n-2}}}$. This is a joint work with M. del Pino, M. Musso and J. Wei.

双曲分会场

邓师瑾（上海交通大学）

题目：Pointwise structures and background perturbation analysis for thermal non-equilibrium irrotational flows in three space dimensions

摘要：I will talk about the pointwise space-time structures of the solution for a three-dimensional model describing gas dynamics in thermal non-equilibrium and its background stabilities under the small initial perturbation assumption and the irrotationality condition. Our main tools are the modified Green's function according to the irrotationality condition, a priori energy method and an improved decay estimates of products composed of the entropy function and high-order derivatives.

丁冰冰（南京师范大学）

题目：Global existence and blow-up for 2D quasilinear waves with higher-order null conditions

摘要：In this talk, we discuss the global existence and finite-time breakdown of smooth solutions to two-dimensional quasilinear wave equations with short-pulse initial data under higher-order null conditions. Suppose that the equation satisfies the k-th order null condition, while the (k + 1)-th order null condition fails. A natural critical exponent $\varepsilon_k^* = \frac{k}{k+1}$ then arises in the size of the short-pulse data. Under a first-order outgoing constraint condition, we show that smooth solutions exist globally when $0 < \varepsilon_0 < \varepsilon_k^*$. In contrast, for $\varepsilon_0 \in [\varepsilon_k^*, 1)$, the corresponding solutions develop singularities in finite time. We also obtain a sharp asymptotic estimate for the lifespan of the solution. These results identify the critical threshold separating global existence from finite-time breakdown and show that the higher-order null structure plays a decisive role in the evolution of short-pulse solutions. This talk is based on the joint works with Prof. XIN Zhouping (CUHK) and Prof. YIN Huicheng (NNU).

费明稳（安徽师范大学）

题目：Sharp interface limit of the 3D Navier-Stokes/Allen-Cahn system

摘要： There are two important model categories: sharp interface models and diffuse interface models to study phase transition problems. For sharp interface models the interface is assumed to be a hypersurface with zero width. In contrast, diffuse interface models treat the interface as a transition layer (also called diffuse interface) with small width, and another a typically order parameter (also called phase field) is introduced to model the process of phase transition across the transition layer. Both model types are usually derived from physical principles or observations and can be used to model the same situations in applications. This motivates to study the connection between diffuse and sharp interface models by sending the interfacial width to zero. Such limits are known as "sharp interface limits". In this talk we shall prove convergence of the solutions of the 3D Navier-Stokes/Allen-Cahn system to solutions of the sharp interface model. This talk is based on a joint work with Helmut Abels, Yadong Liu and Maximilian Moser.

高宸（中国科学技术大学）

题目：Long-time dynamics and nonlinear stability of semi-similar Prandtl flows

摘要： We investigate the long-time behavior and nonlinear stability of semi-similar Prandtl flows near a stagnation point. Using the Crocco transformation, we reduce the problem to a degenerate parabolic equation and prove global well-posedness, exponential convergence to the self-similar profile, and nonlinear stability for monotone Oleinik-type initial data. The analysis is based on Green's function estimates for the linearized Crocco operator and a dynamically preserved concavity property, which provides the essential damping mechanism.

高俊磊（浙江师范大学）

题目：Structural stability of transonic shocks and mixed boundary value problems of nonlocally strongly coupled elliptic-hyperbolic equations

摘要： In this talk, we will introduce the physical mechanisms that lead to the structural stability of transonic shocks in high-dimensional nozzles, and present a study on the well-posedness of solutions to mixed boundary value problems for nonlocally strongly coupled elliptic-hyperbolic equations. In addition, we will also discuss the structural stability of combustion detonation waves with ignition temperature in two-dimensional nozzles, which provides a clear mathematical explanation for combustion phenomena in high-dimensional nozzles. This is a joint work with Prof. Gui-qiang G. Chen, Prof. Hairong Yuan, Prof. Wei Xiang, and Prof. Jie Kuang.

顾旭旻（上海财经大学）

题目：Low Mach number limit of the free boundary problem for the Euler- Fourier system

摘要： In this talk, we consider the free boundary problem for the Euler-Fourier system that describes the motion of compressible, inviscid and heat-conducting fluids. The effect of surface tension is neglected and there is no heat flux across the free boundary. We prove the uniform estimates with respect to the Mach number of the solutions to the free-boundary Euler-Fourier system with large temperature variations for the well-prepared initial data, which allow us to justify the convergence towards the free-boundary inviscid low Mach number limit system by the strong compactness argument.

赖宁安（绍兴大学）

题目：Morawetz type estimates for wave/Schrödinger equations and its applications

摘要： In this talk, I will talk about some Morawetz type estimates for the wave/Schrödinger equations. And some related results with its application will be discussed.

李思然（上海交通大学）

题目：Existence of global $W^{2,p}$-isometric immersions for negatively curved surface metrics with unbounded second fundamental form

摘要： This talk is on the existence theory of isometric immersions of surfaces with negative Gaussian curvature into the 3-dimensional Euclidean space. We reformulate the Gauss-Codazzi equations, the partial differential equations for isometric immersions, into hyperbolic conservation laws for the flows of Chaplygin gas with nonzero source terms. Then, by employing the theories of invariant regions and compensated compactness, we establish the existence of $W^{2,p}$-isometric immersions for several general families of metrics, with any finite index p and over arbitrarily large infinite strips or rectangular domains. Such metrics include those of various classical minimal surfaces: helicoid, catenoid, pseudosphere, and Enneper surfaces, as well as metrics in isothermal coordinates or of the “reciprocal-type”. In our fluid dynamical formulation of the isometric immersion problem, we specialise in the case that the two Riemann invariants for the associated hyperbolic conservation law remain bounded and of distinctive signs, and obtain L^p-solutions to the initial-boundary value problem via entropy analysis. The isometric immersions constructed in this paper may have unbounded but L^p-integrable second fundamental forms.

吕博强（南昌大学）

题目：Global classical solutions to the full compressible Navier-Stokes equation with slip boundary conditions

摘要：This talk concerned with the initial-boundary-value problem of the full compressible Navier-Stokes system with Navier-slip boundary conditions on the velocity and Neumann boundary one on the temperature. We establish the global existence of the classical solutions, under the condition that the initial total energy is suitably small. It should be noted that the initial density and temperature are allowed to vanish.

章俊彦（中国科学技术大学）

题目：The incompressible limit of free-surface inviscid fluids

摘要：This talk concerns the incompressible limit for free-surface inviscid fluids, with particular emphasis on the compressible Euler equations. In contrast to fixed-domain problems, the motion of the free interface introduces new and substantial difficulties. We will present methods for establishing this singular limit in various settings, depending on the initial singular-perturbation scaling, the boundary conditions, including whether surface tension and vortex sheets are taken into account.

朱圣国（上海交通大学）

题目：Global classical solutions of the multi-dimensional degenerate compressible Navier-Stokes equations with large data of spherical symmetry

摘 要：A fundamental open problem in the theory of the compressible Navier-Stokes equations is whether regular spherically symmetric flows can develop singularities, such as cavitation or implosion in finite time. A formidable challenge lies in how the well-known coordinate singularity at the origin can be overcome to control the lower or upper bound of the density. In this paper, we consider viscosity coefficients that are degenerately density-dependent, as in the shallow water equations. We prove that, for general large spherically symmetric initial data with bounded positive density, solutions remain globally regular and do not develop cavitation or implosion in two and three spatial dimensions. Moreover, far-field vacuum is allowed for the initial data under consideration here.

朱异（华东理工大学）

题目：Global existence and stability of solutions for the 2D non-resistive compressible MHD system

摘要： This paper investigates the non-resistive compressible magnetohydrodynamic (MHD) equations in $\mathbb{R}^2$. We establish the global existence and stability of classical solutions for initial data sufficiently close to a constant equilibrium state. A distinguishing feature of our result is that global stability is derived solely from pure H^s energy estimates and an intrinsic L^2 time-decay mechanism, thereby bypassing the traditional requirement for the initial data of L^1 integrability or negative-order Sobolev norm regularity. To achieve this goal, we first introduce a specific quantity motivated by the effective viscous flux, which intrinsically couples the density and magnetic field perturbations. Secondly, to overcome the critical time-decay obstacle arising from the absence of negative-order regularity, we develop a novel pseudo-negative-derivative technique. Moreover, we regard the wildest nonlinear term as a whole and bypass the need to obtain time-decay estimate for individual components. These approaches enable us to close the higher-order energy estimate entirely within standard Sobolev spaces.

数学物理分会场

何孝凯（湖南第一师范学院）

题目：Newman-Penrose 框架及其在广义相对论中的应用

摘要: 本报告首先简要介绍 Newman-Penrose(NP)框架。在此基础上，讨论 NP 框架在黑洞唯一性定理，以及多重齐次时空中 Bondi 型能量构造方面的具体应用。本报告内容主要基于报告人与谢纳庆教授、吴小宁研究员的合作研究成果。

凌黎明（华南理工大学）

题目：Orbital stability of finite-gap solutions for nonlinear Schrödinger equation

摘要： We investigate the orbital stability of periodic finite-gap solutions for the focusing nonlinear Schrödinger equation via finite-gap spectral theory. For solutions with commensurate spatial frequencies, we construct a Lyapunov functional and examine its Hessian using spectral techniques and Kummer geometry. Under reasonable spectral hypotheses, the finite-gap orbit is orbitally stable against subharmonic perturbations after a Galilean transformation. In the case of symmetric genus-two spectral curves, the stability conditions reduce to explicit inequalities for Abelian integrals. This work is joint with Huajie Su and Xuan Sun.

沈舜麟（中国科学技术大学）

题目：On the mean-field and semiclassical limit from quantum N-body dynamics

摘要： We study the mean-field and semiclassical limit of the quantum many-body dynamicswith a repulsive δ-type potential $N^{3\beta}V(N^{\beta}x)$ and a Coulomb potential, which leads to a macroscopic fluid equation, the Euler-Poisson equation with pressure. We prove quantitative strong convergence of the quantum mass and momentum densities up to the first blow up time of the limiting equation. The main ingredient is a functional inequality on the δ-type potential for the almost optimal case $\beta\in(0,1)$, for which we give an analysis of the singular correlation structure between particles. This talk is based on a joint work with Xuwen Chen and Zhifei Zhang.

田守富（中国矿业大学）

题目：On Cauchy problem to the modified Camassa-Holm equation: Painlevé asymptotics

摘要: We investigate the Painlevé asymptotics for the Cauchy problem of the modified Camassa-Holm (mCH) equation with decaying initial data $m_t + \left((u^2 - u_x^2)m\right)_x + \kappa u_x = 0, (x,t) \in \mathbb{R} \times \mathbb{R}^+, u(x,0) = u_0(x)$, where $u_0(x) \in H^{4,2}(\mathbb{R})$ and κ is a constant. The main purpose of our work is to study the asymptotic behavior of the mCH equation in the transition regions, which are the critical regions between the different solitonic regions. The key is to establish a connection between the solution for the Cauchy problem of the mCH equation in the transition region and the Painlevé II equation. With the $\bar{\partial}$-generalization of the Deift-Zhou nonlinear steepest descent method and double scaling limit technique, in two transition regions defined by: $\mathcal{P}_I := \{(x,t): 0 \le \left|\frac{x}{t} - 2\right| t^{2/3} \le C\}$ and $\mathcal{P}_{II} := \{(x,t): 0 \le \left|\frac{x}{t} + 1/4\right| t^{2/3} \le C\}$, where C>0 is a constant, we obtain that the leading order approximation to the solution of the mCH equation can be expressed in terms of the Painlevé II equation.

王伟（南京大学）

题目：Asymptotic behavior of energy for N-interacting 2D particles on real line

摘要： In this talk we show the asymptotic behavior of the energy of a N-interacting two dimensional particles system which is defined on real line. Under the diffusion space-time scale and the mean field interaction, the limit of the total energy of the system converges weakly to a heat equation as N goes to infinity. The diffusion coefficient is also given explicitly.

吴奕飞（南京师范大学）

题目：Long-time error growth in Strang splitting method for the nonlinear Schrodinger equation

摘要： TBA

徐霄乾（昆山杜克大学）

题目：AI Proofs in PDEs

摘要： In this talk, I will discuss recent results on fluid equations done by AI. I will first outline the relationship between the mixing properties of incompressible flows and the diffusion process, including dissipation enhancement. I will then focus on the so-called unmixing phenomenon and on the existence of Batchelor scales for certain flows, both of which are results recently proved using AI.

虞国富（上海交通大学）

题目：The trigonometric-type three-field Blaszak-Marciniak lattice equation

摘要： In this talk, we propose a novel variant three-field Blaszak-Marciniak (BM) lattice equation by introducing trigonometric-type bilinear operators and leveraging the reduction technique from the variant KP-Toda hierarchy. Applying Hirota's bilinear method, we derive general Gram-type determinant solutions. Rational solutions of the variant BM lattice are obtained via Bäcklund transformation and differential operators method. Higher-order rogue waves are formulated in terms of Schur polynomials, whose peak patterns are linked to the root structures of Yablonskii-Vorob'ev polynomials and Umemura polynomials. Furthermore, three distinct types of breather solutions are identified, and numerical three-periodic wave solutions are computed using the Gauss-Newton method.

臧云龙（扬州大学）

题目：Global existence for general nonlinear Dirac equations via hidden spinorial null structure

摘要： We prove small-data global existence and sharp decay for massless Dirac equations in 2D (cubic nonlinearities) and 3D (quadratic nonlinearities).

Unlike all previous works, we do not square the Dirac operator to a wave equation, nor do we require special nonlinear structures like $\psi\psi$ or $\psi\gamma^5\psi$. Instead, we work directly with the first-order system. By introducing a spinor Lie derivative and uncovering a hidden spinorial null structure inside the Dirac current estimates, we obtain improved decay for the "good" component of the spinor. This allows us to handle general nonlinearities. This is a joint work with Wenya Yang.

张登（上海交通大学）

题目：Stochastic Zakharov system: well-posedness theory and noise- regularization effect

摘要： In this talk we will review some recent results on the well-posedness theory and noise-regularization effect for stochastic Zakharov system in dimensions $d\geq 3$. Our focus is particularly directed at the large data regime where the global existence and long-time dynamics of deterministic Zakharov system is largely open. The noise-regularization effect on scattering is proved up to borderlines dictated by the regularity threshold of noise. These works are in joint with Sebastian Herr, Michael Röckner, Martin Spitz and Zhenqi Zhao.

张华丽（湖南大学）

标题：Low regularity well-posedness for compressible Euler equations with vorticity

摘要：The sharp regularity problem for the three-dimensional compressible Euler equations is one of the central open problems in the theory of nonlinear hyperbolic partial differential equations. In contrast to the incompressible case, the presence of non-trivial vorticity and entropy leads to a delicate coupling between wave propagation and transport, making the sharp regularity theory substantially more difficult. In 2022, Qian Wang established the current known low-regularity well-posedness theory (Ann. of Math. 195 (2022)) and proposed a conjectural optimal regularity threshold. A major obstacle toward this conjecture is that the classical Strichartz framework breaks down once the regularity of the vorticity reaches the critical level.

In this talk, we present a new approach based on frequency-dependent approximate solutions together with a unified time extension argument, which allows us to relax the regularity assumptions on the vorticity and establish new low-regularity well-posedness results for the three-dimensional compressible Euler equations. We also explain how the same strategy extends naturally to relativistic Euler equations. The part is a joint work with Prof. Lars Andersson.

张林（重庆大学）

题目：On the strong cosmic censorship in general relativity

摘要：In this talk, I will first briefly introduce the Strong Cosmic Censorship (SCC) conjecture in general relativity, then present results on linear perturbations, along with some recent progress in the nonlinear setting.

椭圆抛物方程青年论坛报告

边行之（浙江科技大学）

题目：A brief introduction to a class of new phase field model

摘要： We study a novel phase field model driven by configurational forces. The model is an elliptic-parabolic coupled system consisting of a linear elasticity sub-system and an evolution equation for order parameter, which can be used to describe the phase transitions in elastically deformable solid materials, such as motion of grain boundaries. The evolution equation in the model is a non-uniform, degenerate parabolic equation possessing a term which is a non-smooth function of the gradient of order parameter and is not uniformly bounded from below. It differs from the Allen-Cahn/Cahn-Hilliard equation by this non-smooth gradient term.

何静宁（杭州师范大学）

题目：Well-posedness and long-time behavior of a Navier-Stokes-Cahn-Hilliard system with chemotaxis and singular potential

摘要： In this talk, I will talk about our recent results on a diffuse interface model that describes the dynamics of incompressible two-phase flows with singular potential and chemotaxis effect. The PDE system couples the Navier-Stokes equations for the fluid velocity, a convective Cahn-Hilliard equation for the phase field variable with an advection-diffusion equation for the nutrient density. We consider the well-posedness and long-time behavior of this initial boundary value problem.This is a joint work with Prof. Hao Wu.

贾皓皓（宁波大学）

题目：The interior curvature bounds of prescribing scalar curvature equations in Minkowski space

摘要： For the prescribing scalar curvature equation, the interior estimates are important issues. In this talk, we study the interior estimates of solutions for scalar curvature equations and establish the pure interior curvature estimate for spacelike hypersurfaces in Minkowski space. Furthermore, we obtain the curvature estimate for graphic hypersurface in Riemannian manifolds.

雷雅婷（湖南工商大学）

题目：The Christoffel-Minkowski type problem in hyperbolic space

摘 要： In this talk, we study the Christoffel-Minkowski type problem in hyperbolic space. Under suitable structural assumptions on f, we establish the existence of smooth and uniformly horospherically convex solutions to a class of fully nonlinear equations on the sphere. This is a joint work with Lu Xu and Yutian Zhou.

李庚霖（河海大学）

题目：Analysis of subcritical-mass solutions to a doubly degenerate chemotaxis system with signal production

摘要： This talk concerns a two-dimensional Keller-Segel system with signal production, subject to homogeneous Neumann boundary conditions. The system is doubly degenerate in the sense that the diffusion of the cell density may vanish when either the cell density or the signal concentration vanishes. In particular, when the initial signal is assumed to be merely nonnegative, the system may start from a genuinely degenerate state, and standard arguments based on uniform parabolicity are not applicable near the initial time.

In the first part of the talk, I will describe the construction of global generalized energy solutions for nonnegative initial data when the total cell mass is below 4π, or below 8π in the radially symmetric setting. The analysis is based on a Keller-Segel-type Lyapunov functional, the Moser-Trudinger inequality, a regularization procedure, and compactness arguments. A key difficulty is that a positive lower bound for the signal concentration is available only on time intervals bounded away from the initial time.

In the second part, I will discuss the qualitative behavior of these solutions in the radially symmetric setting. In particular, the generalized solution is shown to attain the prescribed initial cell density weakly in L^1, even when the initial signal vanishes on nontrivial subsets of the domain. Moreover, if the initial signal is positive at the center of symmetry, then the cell density remains globally bounded, and improved regularity and stronger convergence to the prescribed initial data can be established. Together, these results connect global generalized solvability with the initial-time behavior and global regularity of solutions.

The talk is based on joint work with Tobias Black of Paderborn University.

刘萌（安徽工业大学）

题目：A note on the 8π problem of Jäger-Luckhaus system

摘要： We show that for any nonnegative, radially symmetric and continuous initial datum with critical mass 8π, Jäger-Luckhaus system in the unit disk, known as a parabolic-elliptic Keller-Segel model, admits a globally bounded classical solution. Moreover, it is asserted that the spatial constant equilibrium 8 is globally and exponentially asymptotically stable.

毛宣（河海大学）

题目：Finite-time blow-up in a Keller-Segel model with indirect signal production

摘 要： This talk focuses on a Keller-Segel chemotaxis system involving indirect signal production, which models the impact of phenotypic heterogeneity on population aggregation. The system exhibits a four-dimensional critical mass phenomenon, resulting in unbounded solutions, as first explored in the seminal works of Fujie and Senba (2017, 2019). Building upon this foundation, our recent research establishes the existence of solutions that explode in finite time, thereby providing a more complete picture of singularity formation and offering new insights into the dynamic behavior of population aggregation in the presence of indirect signal production.

梅新群（北京大学）

题目：Prescribed area measure problem of convex capillary hypersurfaces in half Euclidean space

摘要： We introduce a p-th capillary area measure for capillary convex bodies in the Euclidean half-space, aiming to find a capillary convex body with a prescribed capillary surface area measure in the Euclidean half-space. This formulation provides a natural Robin boundary analogue of the classical Minkowski problem introduced by Lutwak. By reducing it to a convex solution of a Hessian quotient equation on a spherical cap with a Robin boundary condition, we solve the capillary Lp Minkowski problem and Lp Christoffel-Minkowski problem in the smooth category. This work was completed in collaboration with Prof. Guofang Wang and Dr. Liangjun Weng.

王斌（西湖大学）

题目：Hypersurfaces of constant curvature in hyperbolic space with prescribed asymptotic boundary at infinity

摘要： We investigate the problem of finding, in hyperbolic space, complete hypersurfaces of constant curvature with a prescribed asymptotic boundary at infinity for a general class of curvature functions. We particularly focus on graphs over a domain whose boundary has nonnegative mean curvature. The cases of constant mean curvature and constant Gauss curvature graphs were resolved long ago. In this talk, we discuss about the constant scalar curvature case.

谢炯铎（上海交通大学）

题目：Solutions of the singular Yamabe problem near singular boundaries

摘要： In this talk, we investigate the asymptotic behaviors of solutions to the singular Yamabe problem with negative constant scalar curvature near singular boundaries and derive optimal estimates, where the background metrics are not assumed to be conformally flat. Specifically, we demonstrate that for a wide class of Lipschitz domains with asymptotic conical structure, the local positive solutions are well approximated by the positive solutions in the tangent cones at singular boundary points. Furthermore, we can determine the coefficients of all local terms in the asymptotic expansion. This extensively generalizes and refines previous results in the literature. This talk is based on joint work with Weiming Shen and Zhehui Wang.

杨帆（南通大学）

题目：Large-time behavior of solutions to the 3D incompressible Active Nematic model

摘要： Active nematics, as a prototypical and widely investigated class of active matter, are usually modeled by a PDE system within the Beris-Edwards framework. In this talk, we first review some relevant results in this direction. Then, we focus on the case of constant activity c>c$_\star$ and present the global well-posedness for the model with small initial data $(Q_0, u_0) \in H^{s+1} \times H^s \ \ (s \geq 2)$. Next, under an additional L^1 initial assumption, we establish the optimal decay estimates of the global solution (Q,u) for s≥4 via a combination of the Green's function method and the time-weighted energy method. More precisely, we derive the following mixing decay estimates for t≥0:

$$\| \partial^k Q(t)\|_{L^2} \lesssim \ \ (1+t)^{-\frac{3}{4}-\frac{k}{2}} e^{-\frac{(c-c_\star)\Gamma t}{4}}, \quad \text{for all } k \leq s-1,$$
$$\| \partial^k u(t)\|_{L^2} \approx \ \ (1+t)^{-\frac{3}{4}-\frac{k}{2}}, \quad \text{for all } k \leq s-2.$$

This result reveals that, in the high activity regime, active nematics can become isotropic with an activity-dependent exponential convergence rate, which is the first such result established for active/passive nematic liquid crystals under the Q-tensor description. This is a joint work with Xiongfeng Yang.

张驰麟（杜伊斯堡－埃森大学）

题目：Classification of global solutions to the singular equation $-\Delta u = f(X)\cdot u^{-\gamma}$ in a Lipschitz cone

摘要： We construct and classify all global solutions to the singular equation $-\Delta u = f(X)\cdot u^{-\gamma}$ supported in a general Lipschitz cone, where $f(X)$ is a locally Dini continuous function with $0<\lambda\leq f X\leq \Lambda$. The existence of a global solution is closely related to the exponent γ and the "frequency" of the cone.

There are two key steps in proving the classification result. First, we obtain a growth rate estimate for a global solution u by applying the Schauder estimate in the opposite direction. Second, we establish a suitable Harnack principle in the cone, so that an arbitrary global solution is bounded between two standard global solutions Ψ_K's with closer and closer "asymptotic slopes" K's.

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陈志（安徽师范大学）

题目：Sharp decay characterization for the incompressible Oldroyd-B model in critical Lp spaces

摘要： This paper establishes a sharp characterization of temporal decay rates for the incompressible Oldroyd-B model in a critical L^p framework, covering the physically relevant and mathematically delicate case where both the fluid viscosity and the stress tensor damping are absent. We prove that an L2 -type condition on the low- frequencies part of the initial data (u0, τ 0) is almost both necessary and sufficient for obtaining optimal upper and lower bounds on the temporal decay of solutions in critical Besov spaces. A key contribution is a new decomposition of the stress tensor into its incompressible and compressible parts, combined with the introduction of an effective tensor to handle the loss of regularity in the high-frequencies velocity field. This is the first result to reveal such precise two-sided asymptotics for the incompressible Oldroyd-B model without viscosity or damping.

高普（中国计量大学）

题目：Global dynamics of global classical solution to radially symmetric unsteady flows with nonzero angular velocity in an annulus

摘要： For steady inviscid compressible flows with radial symmetry in an annulus, Weng et al. have demonstrated the global existence of steady solutions (Weng et al.， 2021). We consider the global stability of steady supersonic solution to radially symmetric flows with nonzero angular velocity in an annulus. Furthermore, we can also get the temporal periodicity of classical solutions under the assumption of time-periodic boundary conditions.

何程（宁波大学）

题目：Asymptotic stability of peakons for the Camassa-Holm equation on the half-line

摘要： In this report, we establish the asymptotic stability of peakons for the Camassa-Holm equation on the half-line under the Dirichlet boundary condition. For strong solutions with nonnegative finite momentum initially close in H^1 to a right-moving peakon far from the boundary, we proved that the solution converges strongly to a limiting peakon in the moving frame and in every slower exterior cone, with explicit convergence of the modulation speed and amplitude. The proof combines Dirichlet or Neumann resolvent formulas, a boundary Riccati identity yielding integrable mass loss, localized energy and momentum almost monotonicity, and tangent compactness limits, to which Molinet's full-line Liouville theorem is applied without any odd extension of the strong solution.

李圣鑫（宁波大学）

题目：Structural stability of Prandtl boundary layers in the entire subsonic regime

摘要： Despite their physical significance, there are limited mathematical theories for the compressible Navier-Stokes equations with strong boundary layers. In this talk, Iwill introduce the structural stability of shear flow boundary layer profiles for the two- dimensional steady compressible Navier-Stokes equations. The stability estimates are uniform across the entire subsonic regime, characterized by Mach numbers $m\in(0,1)$. As a byproduct, we provide the first rigorous justification of the low Mach num ber limit in the presence of Prandtl boundary layers. This talk is based on the joint work with Prof. Tong Yang and Zhu Zhang.

毛顺凯（东华大学）

题目：The null condition in elastodynamics leads to non-uniqueness

摘要： We consider the Cauchy problem for the system of elastodynamic equations in two dimensions. Specifically, we focus on materials characterized by a null condition imposed on the quadratic part of the nonlinearity. We can construct non-zero weak solutions $u\in C^1([0,T]\times T^2)$ that emanate from zero initial data. The proof relies on the convex integration scheme. By exploiting the characteristic double wave speeds of the equations, we construct a new class of building blocks. This work extends the application of convex integration techniques to hyperbolic systems with a null condition and reveals the rich solution structure in nonlinear elastodynamics.

孙暄（东华大学）

题目：Elliptic-rogue waves and modulational instability in nonlinear soliton equations

摘要： We derive rational elliptic-rogue wave solutions for integrable nonlinear soliton equations. By combining a refined modified squared-eigenfunction method with the Darboux-Bäcklund transformation, we establish a quantitative link between elliptic rogue waves and modulational instability. Modulational instability of elliptic solutionsgenerates elliptic rogue waves, whereas modulational stability yields elliptic solitons or breathers. The method also produces higher-order elliptic rogue waves, providing a versatile framework for related integrable equations.

王宇（西南交通大学）

题目：Carleman-based iterative regularization for an inverse source problem in stochastic hyperbolic equations

摘要： This talk concerns an inverse source problem for semilinear stochastic hyperbolic equations, where the goal is to recover an unknown source from partial lateral Cauchy data. I will present a globally convergent iterative regularization method based on Carleman estimates and fixed-point iteration. The method does not require a good initialguess and yields stability and convergence results under noisy observations. I will also discuss the corresponding numerical reconstruction scheme and illustrate its performance through several computational examples.

王兆钰（上海大学）

题目：A dense focusing Ablowitz-Ladik soliton gas and its asymptotics

摘要： In this talk, we introduce a soliton gas solution for the focusing Ablowitz-Ladik system. We establish a Fredholm determinant representation of this soliton gas solution and formulate its Riemann-Hilbert characterization. Using the nonlinear steepest descent method, we derive its large space asymptotics at t=0 and large-timeasymptotics in different space-time regions.

肖婷（三峡大学）

题目：Existence of steady supersonic Euler flows past two-dimensional divergent nozzles

摘要： This talk focuses on the existence of the steady supersonic Euler flows through a divergent nozzle which is a part of an angular sector, which does not contain the vertex. Mathematically, with respect to the supersonic direction, the problem can be formulated as an initial-boundary value problem with a radially symmetric background solution. More precisely, under small BV perturbations of radially symmetric initial data, via wave front tracking algorithm, we investigate the existence of entropy solutions to the initial-boundary value problem and such solutions are small perturbations of a big BV background solution. A major difficulty, and also the core innovation of this paper, is that we deal with perturbations of large BV solutions. For this, by selecting the flow deflection angle to parameterize explicitly the genuinely nonlinear wave curves, we develop a modified Glimm functional containing the oscillation growth of background rarefaction waves and the L^∞-norm of velocity, which effectively overcomes the effects caused by the variation of the background solution with position.

徐淑芳（浙江理工大学）

题目：Stability of viscous shock waves for Burgers equation with double singularities in the flux and viscosity

摘要： This talk is concerned with Burgers equation with singular viscosity and singular flux. We show that there exists a smooth viscous shock wave when the singularity for flux is less than the singularity of viscosity, otherwise the shock wave does not exist. The main issue is to show the stability of the shock wave. To overcome the singularitiescaused by viscosity and flux, we use the weighted energy method, where the selection of weights is technical and plays a crucial role in the proof. This talk is based on joint work with Prof. Feimin Huang, Prof. Ming Mei and Prof. Wancheng Sheng.

杨依灵（重庆大学）

题目：Long time asymptotic analysis for some integrable equations

摘要： In this talk, I will briefly introduce the development of the research on asymptotics analysis for some integrable systems. For each of the boundary conditions under consideration, including zero, nonzero, step-like, and algebraic-geometric soliton backgrounds, we reformulate the integrable system into an associated Riemann-Hilbert (RH) problem. Applying the Deift-Zhou nonlinear steepest descent method to these RH problems yields asymptotic expressions for the solutions in various velocity regimes. In particular, at the critical velocity that separates two distinct types of asymptotic behavior, we establish a connection between the integrable system and Painlevé transcendents.

曾梓镕（南京航空航天大学）

题目：Dissipative solutions of the 3D Navier-Stokes equations

摘要： In this talk, I will present our recent result about dissipative solutions of the 3D Navier-Stokes equations. For any divergence free initial data in H1/2, we prove the existence of infinitely many dissipative solutions to the 3D Navier-Stokes equations, whose energy profiles are continuous and decreasing. If the initial data is only L2, our construction yields infinitely many solutions with continuous energy, but not necessarily decreasing. In the stochastic case the constructed solutions are probabilistically strong. Our proof introduces a new convex integration scheme with delicate selections of initial relaxed solutions, backward and forward time intervals, and energy profiles. This talk is based on the joint work with Alexey Cheskidov and Deng Zhang.