



中国科学技术大学
University of Science and Technology of China

变分法与非线性方程会议手册

2026.03.27-2026.03.29





会议信息

一、会议时间

2026年03月28日，会议报到。

2026年03月28日至03月29日，会议学术报告。

2026年03月29日，离会。

二、会议地点

中国科学技术大学第二教学楼 2210 教室

三、会议报告人（按姓氏字母排序）

保继光	北京师范大学	陈 露	北京理工大学
陈 鹏	三 峡 大 学	陈志杰	清 华 大 学
郭玉劲	华中师范大学	郭玉霞	清 华 大 学
李福义	山 西 大 学	刘兆理	首都师范大学
鲁志豪	江苏师范大学	罗森平	江西师范大学
彭双阶	华中师范大学	陶春霞	北京工商大学
王春花	华中师范大学	吴 天	中国科学技术大学
张德凯	华东师范大学	张贻民	武汉理工大学
钟学秀	华南师范大学		

四、会议主持人（按姓氏字母排序）

陈 化	武 汉 大 学	窦井波	陕西师范大学
唐春雷	西 南 大 学	梁 兴	中国科学技术大学
刘 勇	北京工商大学	刘聪文	中国科学技术大学
罗 肖	合肥工业大学	钮维生	安 徽 大 学
王 俊	江 苏 大 学	严树森	华中师范大学
杨健夫	江西师范大学	杨敏波	浙江师范大学



会议信息

四、会议主持人（按姓氏字母排序）

殷 浩 中国科学技术大学

张建军 重庆交通大学

甄茂鼎 合肥工业大学

周焕松 武汉理工大学

周 风 华东师范大学

五、组委会成员（按姓氏字母排序）

陈世炳

李俊钢

麻希南

六、会议联系人

郭林敏 0551-63600572 guolinmin@ustc.edu.cn





会议日程安排

3月27日(周五) 入住酒店			
3月28日(周六)		地点: 二教 2210 教室	
时间	报告人	报告题目	主持人
08:00-08:35	会议签到		
08:35-08:40	开幕式		
08:40-09:20	彭双阶	Qualitative analysis for ground state solutions of logarithmic Schrödinger equations	陈 化
09:25-10:05	罗森平	A slice of the intersection of energy minimization, phase transition, number theory and analysis(PDE)	刘 勇
10:05-10:35	休息及合影		
10:35-11:15	保继光	Liouville-Type Theorems for Ancient Solutions to the Parabolic Monge-Ampère Equation	唐春雷
11:20-12:00	张德凯	The LYZ equation in Kähler geometry	罗 肖
12:00-13:30	午餐地点: 教工食堂		
14:00-14:40	刘兆理	New results on the structure of the solution set of an elliptic system	杨健夫
14:45-15:25	李福义	A local valley theorem and its applications to elliptic equations on bounded domains	张建军
15:25-15:55	休息		
15:55-16:35	陈志杰	Blow up analysis of positive solutions to elliptic systems with critical exponents	周焕松
16:40-17:20	陈 露	Reconstruction by single passive observation and Sommerfeld-Rellich Framework for Scattering on Hyperbolic Space	钮维生
17:25-18:05	陈 鹏	Ground state and semiclassical state for nonlinear Dirac equation	杨敏波
18:10-19:30	晚餐地点: 教工食堂		



会议日程安排

3月29日(周日)		地点: 二教 2210 教室	
时间	报告人	报告题目	主持人
08:40-09:20	郭玉劲	The exchange energy limit of Thomas-Fermi-Dirac-von Weizsacker theory	周 风
09:25-10:05	钟学秀	闭球约束方法在弱下半连续泛函预定质量问题求解中的应用	窦井波
10:05-10:35	休息		
10:35-11:15	郭玉霞	Sign-changing solutions for critical Hamiltonian systems in RN	严树森
11:20-12:00	陶春霞	Existence of the extremals for the high order Hardy-Sobolev-Maz'ya inequalities	梁 兴
12:00-13:30	午餐地点: 教工食堂		
14:00-14:40	王春花	Infinitely many synchronized and segregated vector solutions for a nonlinear Hartree system	王 俊
14:45-15:25	张贻民	Existence and asymptotic behavior of ground state for Dirac equation with Hartree nonlinearity	甄茂鼎
15:25-15:55	休息		
15:55-16:35	吴 天	闭流形上的几何不等式与不变张量技术	刘聪文
16:40-17:20	鲁志豪	Gradient estimates for some quasilinear elliptic equations	殷 浩
17:30-19:00	晚餐地点: 教工食堂		
3月29日(周日) 离会			



报告信息

题目: Qualitative analysis for ground state solutions of logarithmic Schrödinger equations

报告人: 彭双阶, 华中师范大学

时间: 03月28日, 08:40-09:20

摘要: The talk considers the qualitative properties of ground states of the logarithmic Schrödinger equation with magnetic fields. We obtain a ground state solution by revealing the relation between this equation and the power-law Schrödinger equation. We also demonstrate that the ground state solutions are positive and nondegenerate. Moreover, they are unique and radially symmetric up to magnetic translations and rotations in the complex phase space.

题目: A slice of the intersection of energy minimization, phase transition, number theory and analysis(PDE)

报告人: 罗森平, 江西师范大学

时间: 03月28日, 09:25-10:05

摘要: Through functions of various geometric shapes, energy minimization, phase transition, number theory and analysis (PDE) meet at a large domain. The domain is open, I shall present only a slice of it.



报告信息

题目: Liouville-Type Theorems for Ancient Solutions to the Parabolic Monge-Ampère Equation

报告人: 保继光, 北京师范大学

时间: 03月28日, 10:35-11:15

摘要: We investigate classical ancient solutions to the parabolic Monge-Ampère equation $-u_t \det D^2u = f(x,t)$ in $\mathbb{R}_-^{\{n+1\}}$. We establish asymptotic behaviors of solutions when f is a perturbation of 1 at infinity, and prove corresponding Liouville theorems when f is periodic.

题目: The LYZ equation in Kähler geometry

报告人: 张德凯, 华东师范大学

时间: 03月28日, 11:20-12:00

摘要: In Kähler geometry, the LYZ equation, also known as the deformed Hermitian-Yang-Mills equation, is a fully nonlinear elliptic partial differential equation that arises from mirror symmetry. In this talk, we present existence results for smooth solutions to the LYZ equation in the critical phase on compact Kähler manifolds. This is joint work with Prof. Jixiang Fu and Prof. Shing-Tung Yau.



报告信息

题目: New results on the structure of the solution set of an elliptic system

报告人: 刘兆理, 首都师范大学

时间: 03月28日, 14:00-14:40

摘要: In this talk, I will discuss recent results on the number of positive solutions for a specific class of elliptic systems. A complete picture of the structure of the set of positive solutions will be given. This is joint work with Yongtao Jing, Fanqin Liu, Haidong Liu, Yanyan Liu, Juncheng Wei, Zhangjian Yan.

题目: A local valley theorem and its applications to elliptic equations on bounded domains

报告人: 李福义, 山西大学

时间: 03月28日, 14:45-15:25

摘要: In this paper, we develop a general minimax framework for constrained variational problems, establish a local valley theorem for finding sign-changing critical points of functionals on constraint manifolds, and further give a positive answer to the question concerning the existence of sign-changing normalized solutions for constrained nonlinear elliptic boundary value problems on bounded domains. The abstract results can be applied to study the existence of sign-changing solutions for other constrained problems, and the results for nonlinear elliptic problems extend some existing results in the literature. The results presented here were joint work with Cui Zhang and Zhanping Liang.



报告信息

题目: Blow up analysis of positive solutions to elliptic systems with critical exponents

报告人: 陈志杰, 清华大学

时间: 03月28日, 15:55-16:35

摘要: In this talk, I will introduce some results about the bubbling analysis of positive solutions to coupled nonlinear Schrodinger equations with critical points. We will see that the sign of the coupling constant effects the asymptotic behavior of solutions in an essential way.





报告信息

题目: Reconstruction by single passive observation and Sommerfeld-Rellich Framework for Scattering on Hyperbolic Space

报告人: 陈露, 北京理工大学

时间: 03月28日, 16:40-17:20

摘要: In this talk, I will first revisit the longstanding inverse problem of simultaneously recovering both causal sources and medium parameters from a single passive boundary observation, and present our recent progress on this problem. Second, I will introduce a complete time-harmonic scattering theory we have established for hyperbolic space, formulated within the classical Sommerfeld-Rellich paradigm centered on the far-field pattern. This theory is deeply connected to the physical framework of Anti-de Sitter (AdS) theory, providing a natural language for describing how bulk wave propagation is reflected in boundary observables. Our work lays the groundwork for a far-field-based approach to scattering and inversion in hyperbolic geometry. Due to the local nature of the hyperbolic Sommerfeld radiation condition, this framework can be readily extended to the broader class of asymptotically hyperbolic manifolds.

题目: Ground state and semiclassical state for nonlinear Dirac equation

报告人: 陈鹏, 三峡大学

时间: 03月28日, 17:25-18:05

摘要: In this talk, we will report our results on Dirac equation, we first establish the existence of ground state solution under mild assumption by using non-Nehari method. On the other hand, we construct semiclassical states around the local minimum points of the potential.



报告信息

题目: The exchange energy limit of Thomas-Fermi-Dirac-von Weizsacker theory

报告人: 郭玉劲, 华中师范大学

时间: 03月29日, 08:40-09:20

摘要: In this talk, we discuss the variational problem of Thomas-Fermi-Dirac-von Weizsacker theory with the Coulomb potential. We focus on the uniqueness and multiplicity of positive minimizers in the large exchange energy limit. This is joint work with Bin Chen and Shu Zhang.

题目: 闭球约束方法在弱下半连续泛函预定质量问题求解中的应用

报告人: 钟学秀, 华南师范大学

时间: 03月29日, 09:25-10:05

摘要: 在约束变分框架下, 规范化解 (或更一般的等式约束) 问题的研究可先松弛为闭球约束 (不等式约束) 问题的求解, 后再进一步验证所求之解恰好满足相应的质量约束条件 (约束等号成立)。受 F.H.Clarke 在《A new approach to Lagrange multipliers》(Math. Oper. Res., 1(2):165--174, 1976) 中关于凸约束优化问题研究的启发, 近年来报告人及其合作者针对具有弱下半连续性的泛函, 发展出“闭球约束结合 Liouville 定理”与“闭球约束结合零质量问题分析”的研究路径, 并成功应用于多个问题的研究中, 取得了良好效果。并重点汇报一下 (与 Louis Jeanjean 和张建军两位教授合作) 最近在拟线性薛定谔方程的规范化基态解研究方面的应用成果。



报告信息

题目: Sign-changing solutions for critical Hamiltonian systems in RN

报告人: 郭玉霞, 清华大学

时间: 03月29日, 10:35-11:15

摘要: We build infinitely many geometrically distinct non-radial sign-changing solutions for the Hamiltonian-type elliptic systems $-\Delta u = |v|^{p-1}v \ \ \text{in} \ \ \mathbb{R}^N, -\Delta v = |u|^{q-1}u \ \ \text{in} \ \ \mathbb{R}^N,$ where the exponents (p,q) satisfy $p,q > 1$ and belong to the critical hyperbola $\frac{1}{p+1} + \frac{1}{q+1} = \frac{N-2}{N}$.

To establish this result, we introduce several new ideas and strategies that are both robust and potentially applicable to other critical problems lacking the Kelvin invariance.

题目: Existence of the extremals for the high order Hardy-Sobolev-Maz'ya inequalities

报告人: 陶春霞, 北京工商大学

时间: 03月29日, 11:20-12:00

摘要: In this talk, we will first recall some sharp geometric inequalities and their extremals. Then we will present our recent progress on the existence of extremals for Hardy-Sobolev-Maz'ya inequalities (HSM) on the upper-half space. We develop the dual theory of minimizing sequence, the concentration-compactness principle for radial function on the hyperbolic setting, which combined with Helgason-Fourier analysis and the Riesz rearrangement inequality on the hyperbolic space, resolves the lack of compactness. As an application, we also obtain the existence and symmetry of the positive solution for the high order critical Brezis-Nirenberg equation on the entire hyperbolic space.



报告信息

题目: Infinitely many synchronized and segregated vector solutions for a nonlinear Hartree system

报告人: 王春花, 华中师范大学

时间: 03月29日, 14:00-14:40

摘要: We study the following nonlinear Hartree system

$$-\Delta u + P(x)u = \mu_1 \phi_u u + \beta \phi_{uv}, \quad x \in \mathbb{R}^3,$$

$$-\Delta v + Q(x)v = \mu_2 \phi_v v + \beta \phi_{uv}, \quad x \in \mathbb{R}^3,$$

where $\phi_u(x) := \int_{\mathbb{R}^3} \frac{u^2(y)}{|x-y|} dy$ for any $u \in H^1(\mathbb{R}^3)$, and $P(x)$ and $Q(x)$ are

bounded radial functions. Assuming that $P(x)$ and $Q(x)$ satisfy some decay

properties at infinity and β takes some appropriate value, we construct

infinitely many both synchronized and segregated solutions by the finite

dimensional reduction argument, which include positive solutions and sign-changing solutions.

题目: Existence and asymptotic behavior of ground state for Dirac equation with Hartree nonlinearity

报告人: 张贻民, 武汉理工大学

时间: 03月29日, 14:45-15:25

摘要: In this talk, a Dirac equation with Hartree nonlinearity in dimension three was considered. Using the minimax technique, the existence of ground states for this equation was obtained. Then, by detail energy estimates, we also studied the asymptotic behavior of the ground states.



报告信息

题目：闭流形上的几何不等式与不变张量技术

报告人：吴天，中国科学技术大学

时间：03月29日，15:55-16:35

摘要：Sobolev 不等式、Beckner-Onofri 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，该问题可以约化为一类拟线性或半线性椭圆型方程解的分类问题。由于一般流形上的非对称性，微分恒等式是研究解的分类问题的有效手段，然而如何建立微分恒等式是核心挑战。

我们发展了不变张量技术，通过确定具有微分不变性的不变张量，结合量纲分析得到需要的微分恒等式，进而得到方程解的分类结果。报告从实流形上一般的二阶半线性方程出发，介绍不变张量的规律，以此为基础分别：

1. 得到伪 Hermitian 流形上的二阶半线性次临界方程的 Liouville 定理，这解决了王晓东于 2022 年提出的猜想，并将 Frank、Lieb 于 2012 年建立的 CR 球面 Folland-Stein 不等式推广到了伪 Hermitian 流形上。
2. 作为伪 Hermitian 流形上的微分恒等式的应用，我们建立了 Heisenberg 群上的 CR-Yamabe 方程的微分恒等式，回答了 Jerison、Lee 于 1988 年提出的公开问题，并简化了麻希南、欧乾忠于 2023 年得到的次临界指标方程 Liouville 定理的证明。
3. 得到闭流形上的四阶 Liouville 方程的解的分类，这项工作给出了二阶 Beckner 不等式的最佳常数，将 Beckner 于 1993 年的相关工作推广到了闭流形上。此外，我们还得到了完备非紧流形上的四阶次临界指标方程的 Liouville 定理。

这一系列工作是和麻希南、欧乾忠、吴汪哲、周晓合作完成的。



报告信息

题目: Gradient estimates for some quasilinear elliptic equations

报告人: 鲁志豪, 江苏师范大学

时间: 03月29日, 16:40-17:20

摘要: Gradient estimates are fundamental tools in the study of elliptic and parabolic equations. In this talk, we apply these techniques to several classes of nonlinear elliptic equations and present some natural applications, including Liouville-type theorems and Harnack inequalities.

