

第一届几何与偏微分方程青年研讨会

会议手册



山东大学数学与交叉科学研究中心

三峡大学三峡数学研究中心

中俄数学中心（青岛，宜昌）

教育部非线性期望前沿科学中心

2022年3月6日

尊敬的与会嘉宾:

欢迎您参加 2022 年 3 月 6 日第一届“几何与偏微分方程”青年研讨会。本次会议由中俄数学中心青岛和宜昌分中心联合举办,山东大学数学与交叉科学研究中心与三峡大学三峡数学研究中心承办。

特邀报告人 (按姓氏字母排序)

陈小杨 (同济大学)

陈正茂 (广州大学)

邓圣兵 (西南大学)

罗 鹏 (华中师范大学)

帅 伟 (华中师范大学)

王春花 (华中师范大学)

曾小雨 (武汉理工大学)

郑高峰 (华中师范大学)

会议组织委员会

郭常予 (山东大学数学与交叉科学研究中心)

陈 鹏 (三峡大学三峡数学研究中心)

向长林 (三峡大学三峡数学研究中心)

3月6日会议日程

腾讯会议地址：**462 540 324**，会议密码：**0306**

线下地址：山东大学数学与交叉科学研究中心一楼**119**报告厅

三峡大学三峡数学研究中心 L2620 报告厅

日期	时间	报告人	题目	主持人	
3月6日	8:20-8:40	赵永新	开幕式	郭常予	
	8:40-9:20	郑高峰	Regularity of a fourth order linear geometric elliptic system	陈鹏	
	9:30-10:10	曾小雨	Ground states for the quasilinear Schrodinger equation		
	10:20-11:00	陈小杨	Some vanishing theorems on manifolds with almost nonnegative /nonpositive Ricci curvature		
	11:10-11:50	邓圣兵	Existence and multiplicity of solutions for some Kirchhoff type systems with exponential growth		
	午 休				
	14:00-14:40	罗鹏	Qualitative analysis on the critical points of the Robin function	郭常予	
	14:50-15:30	陈正茂	The moment measure on $(n-1)$ -dimensional unit sphere		
	15:40-16:20	王春花	Existence and local uniqueness of normalized peak solutions for a Schrodinger-Newton system	向长林	
	16:30-17:10	帅伟	Nodal solutions for a gauged nonlinear Schrodinger equation in R^2		
	离开会议				

报告摘要信息

陈小杨（同济大学）

报告题目：Some vanishing theorems on manifolds with almost nonnegative/nonpositive Ricci curvature

摘要：In this talk we will discuss our recent work on vanishing theorems on manifolds with almost nonnegative/nonpositive Ricci curvature, which includes vanishing theorems of Euler number and elliptic genus.

陈正茂（广州大学）

报告题目：The moment measure on $(n-1)$ -dimensional unit sphere

摘要：Motivated by the celebrated works of Huang, Xi and Zhao (Adv. Math. 2021) and Cordero-Erausquin and Klartag (J. Funct. Anal. 2015), we define the so-called Moment measure on the unit sphere. In a unified framework, we can define many geometric measures arisen in Convex Geometry and Potential Theory, such as the classical surface area measure, dual curvature measure, harmonic measure, capacity measure and the first eigenvalue measure of Laplace operator. Under suitable conditions, the Moment measure mentioned above is absolutely continuous with respect to the surface measure and is weakly continuous in the sense of Hausdorff metric when considering it as a functional of domain. The prescribing Moment measure problem on the unit sphere was posed and solved.

邓圣兵（西南大学）

报告题目：Existence and multiplicity of solutions for some Kirchhoff type systems with exponential growth

摘要：In this talk, I will present some results about the existence and multiplicity of solutions for some Kirchhoff type systems involving the Trudinger-Moser exponential growth nonlinearities. The Kirchhoff term and the lack of compactness of the associated energy functional due to the Trudinger-Moser embedding have to be overcome via some techniques.

罗鹏（华中师范大学）

报告题目：Qualitative analysis on the critical points of the Robin function

摘要：Let $\Omega \subset \mathbb{R}^N$ be a smooth bounded domain with $N \geq 2$ and $\Omega_\epsilon = \Omega \setminus B(P, \epsilon)$, where $B(P, \epsilon)$ is the ball centered at $P \in \Omega$ with radius ϵ . In this talk, we establish the number, location and non-degeneracy of critical points of the Robin function in Ω_ϵ for ϵ small enough. We will show that the location of P plays a crucial role on the existence and multiplicity of the critical points. The proof of our result is a consequence of delicate estimates on the Green function near to the boundary $\partial B(P, \epsilon)$. Some applications to calculating the exact number of solutions of related well-studied nonlinear elliptic problems will be showed. This is a jointed work with Francesca Gladiali, Massimo Grossi and Shusen Yan.

帅伟（华中师范大学）

报告题目：Nodal solutions for a gauged nonlinear Schrodinger equation in \mathbb{R}^2

摘要：In this talk, I will talk about the existence of nodal solutions for a gauged nonlinear Schrodinger equation in \mathbb{R}^2 . We mainly focus on the zero mass case, this case is more difficult, since we cannot find a suitable variational space. We will introduce a different method, and give some existence results on nodal solutions.

王春花（华中师范大学）

报告题目：Existence and local uniqueness of normalized peak solutions for a Schrodinger-Newton system

摘要：In this talk, we will mainly discuss the existence and local uniqueness of normalized peak solutions for a Schrodinger-Newton system under the assumption that the trapping potential is degenerate and has non-isolated critical points. This is a joint work with Qing Guo, Peng Luo and Jing Yang.

曾小雨（武汉理工大学）

报告题目：Ground states for the quasilinear Schrodinger equation

摘要：For a class of quasilinear Schrodinger equation, which is used in the theoretical study of Bose-Einstein condensates, we establish the existence and nonexistence of ground states under differential parameter regimes. We also investigate the limit behavior of ground states as the parameters go to the thresholds.

郑高峰（华中师范大学）

报告题目：Regularity of a fourth order linear geometric elliptic system

摘要：In this talk, we are concerned with some regularity issues of the fourth order Lamm-Riviere system

$$\Delta^2 u = \Delta(V \cdot \nabla u) + \operatorname{div}(w \nabla u) + (\nabla \omega + F) \cdot \nabla u + f$$

in dimension four, with an inhomogeneous term f which belongs to some natural function space. We obtain optimal higher order regularity and sharp Holder continuity of weak solutions. Among several applications, we derive weak compactness for sequences of weak solutions with uniformly bounded energy, which generalizes the weak convergence theory of approximate biharmonic mappings. This is a joint work with C.-Y. Guo and C.-L. Xiang.