

2010年度
长江三角洲偏微分方程学术研讨会

暨长江三角洲偏微分方程博士生论坛

上海 中国

2010.11.05-07



资助

上海市第五期重点学科-数学科学与技术

上海大学研究生部

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会议介绍

2010 年度

长江三角洲偏微分方程学术研讨会

暨长江三角洲偏微分方程博士生论坛

会议目的

为了进一步加强长三角地区偏微分方程学术交流,展示偏微分方程领域专家学者们的最新研究成果,促进交流与合作,长江三角洲偏微分方程学术研讨会暨长江三角洲偏微分方程博士生论坛将于 2010 年 11 月 5 日至 2010 年 11 月 7 日在上海大学举行。欢迎长江三角洲地区偏微分方程领域的专家学者,特别是青年学者和研究生踊跃参加。

学术委员会:

谷超豪	(复旦大学)
李大潜	(复旦大学)
姜礼尚	(同济大学)
陈恕行	(复旦大学)
洪家兴	(复旦大学)

组织委员会:

王亚光	(上海交通大学)
盛万成	(上海大学)
王远弟	(上海大学)
张大军	(上海大学)
贾筱楣	(上海大学)
刘见礼	(上海大学)

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日程安排:

注册日: 2010年11月5日 12:00-23:00

注册地点: 乐乎新楼(上海大学宝山校区北门), 上海市上大路99号

会议时间: 2010年11月6日至7日

住宿

上海大学宝山校区乐乎新楼

交通

➤ 火车

上海火车站南站 → 上海大学

线路1: 乘坐轨道交通1号线至常熟路换乘轨道交通7号线至上海大学站下
总票价约5元。

线路2: 乘坐出租车至锦秋路716号, 上海大学宝山校区北门下
总票价约90元。

上海火车站 → 上海大学

线路3: 乘坐轨道交通1号线至常熟路换乘轨道交通7号线至上海大学站下
总票价约5元。

线路4: 乘坐轨道交通3号线至镇坪路换乘轨道交通7号线至上海大学站下
总票价约5元。

线路5: 乘坐出租车至锦秋路716号, 上海大学宝山校区北门下
总票价约50元。

线路6: 乘坐公交车

58路: 上海火车站(恒丰路) → 终点站(近锦秋路716号, 上海大学宝山校区北门)
总票价约2元。

185路: 上海火车站(恒丰路) → 终点站(近锦秋路716号, 上海大学宝山校区北门)
总票价约2元。

会议日程

会议程序册

2010年11月5日（周五）

时间	地点:乐乎新楼
12:00-23:00	注册
17:00-21:00	晚餐

友情提示: 我们会在 17:00-21:00 于乐乎新楼餐厅提供晚餐。由于餐厅工作时间最晚为 21:00, 因此, 需要晚餐的代表请于 21:00 之前到达餐厅。

2010年11月6日（周六）

时间	地点:J202	
	报告人\题目	主持人
07:00-08:00	早餐(地点:乐乎新楼)	
09:00-09:40	开幕式及合影留念	盛万成
09:40-10:20	肖体俊 复旦大学 Second order differential operators subject to Feller–Wentzell type boundary conditions	王亚光
10:20-10:40	茶歇 (地点:会场大厅)	

2010年11月6日（周六）

时间	地点: J202	
	报告人\题目	主持人
10:40-11:20	R. Alexandre 上海交通大学 Homogenization, Nonlocal effects and kinetic equations	麻希南
11:20-12:00	范恩贵 复旦大学 超对称方程的可积性---超 Bell 多项式方法	
12:00-14:00	午餐（地点：乐乎新楼）	

2010年11月6日(周六)

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目	主持人	报告人\题目	主持人
14:00-14:40	梁进 上海交通大学 Approximations of higher order evolution equations	边保军	王毅 中国科技大学 Homoclinic Orbits for a Spatial-dependently Perturbed Nonlinear Schrodinger Equation	周忆	贺劲松 宁波大学 Rogue wave for variable coefficient soliton equations	张卫国
14:40-15:20	陶有山 东华大学 Chemotaxis-haptotaxis systems		张挺 浙江大学 Random data Cauchy theory for the generalized incompressible Navier--Stokes equations		左达峰 中国科技大学 Euler equations related to the generalized Neveu-Schwarz algebra	
15:20-15:40	茶歇 (地点:会场大厅)					

2010年11月6日(周六)

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目		报告人\题目	主持人
15:40-16:00	阮卓婷 南京大学 Journe 型奇异积分算子在多参数 Hardy 空间上有界的判别准则	梁进	徐红梅 河海大学 奇数维空间中带耗散结构波动方程解的衰减估计	袁海荣	田可雷 中国科技大学 The symmetric q-deformed KP hierarchy	范恩贵
16:00-16:20	蔡静静 同济大学 Existence, uniqueness and stability of traveling waves of a mean curvature equation		胡玉玺 上海交通大学 Global solutions of one-dimensional nonlinear thermoelasticity with second sound		赵松林 上海大学 Direct linearization method and Cauchy matrix method	
16:20-16:40	胡波文 中国科技大学 Constant Rank Theorem Of The Spacetime Convex Solution Of Heat Equation		孙庆有 浙江大学 Two-point boundary value problems and exact controllability for several kinds of linear and nonlinear wave equations		程纪鹏 中国科技大学 Recursion operators for KP, mKP and Harry-Dym Hierarchies	

2010年11月6日（周六）

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目		报告人\题目	主持人
16:40-17:00	蒋飞达 南京理工大学 Dirichlet problems of Monge-Ampère type equations arising from optimal transportation	梁进	林春进 河海大学 Asymptotic Stability of Rarefaction Waves in Radiative Hydrodynamics	徐红梅	周统 上海交通大学 Remark on Camassa-Holm Equation	章国庆
17:00-17:20			孙杰 中国科技大学 The Boltzmann equation with potential force in the whole space		陈守婷 上海大学 Symmetries for the Ablowitz-Ladik hierarchy	
18:00-20:00	晚宴（地点：乐乎新楼）					
20:30-21:00	参会教授座谈会（地点：乐乎新楼）					

2010年11月7日(周日)

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目		报告人\题目	主持人
08:30-09:10	宣本金 中国科技大学 Sobolev 型不等式和临界指数问题	桂贵龙	孔德兴 浙江大学 双曲几何流及其应用	李亚纯	夏铁成 上海大学 A new loop algebra A5 and its applications to integrable system	左达峰
09:10-09:30	许孟 南京理工大学 一类退化椭圆方程边值问题的径向解	宣本金	吕艳 南京理工大学 平均逼近奇异扰动的阻尼非线性随机波动方程	王毅	吴国成 东华大学 Lie 群方法求解分数阶反常扩散方程	夏铁成
09:30-09:50	胡顺泰 同济大学 公司债券的优化定价及其 Bellman 方程		杨永富 河海大学 极值曲面方程 Lipschitz 解的适定性及渐近性		朱晓明 上海大学 Lump solutions of the Kadomtsev-Petviashvili I equation in non-uniform	
09:50-10:10	茶歇 (地点:会场大厅)					

2010年11月7日(周日)

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目	主持人	报告人\题目	主持人
10:10-10:30	桂贵龙 江苏大学 Stability to the incompressible Navier-Stokes equations	许孟	顾琪龙 上海交通大学 关于节点状态的精确边界能控性	方北香	陶司兴 上海大学 超可积系统及其超Hamiltonian 结构	田可雷
10:30-10:50	黄杰 南京理工大学 A variational method for Real Ultrasound Image Despeckling using a primal dual algorithm		曲鹏 复旦大学 部分耗散拟线性双曲型方程组的整体经典解		施英 上海大学 Generalized solutions of three lattice equations in ABS list	
10:50-11:10	陈传强 中国科技大学 Curvature estimates for the level sets of spatial quasiconcave solutions to a class of parabolic equations		唐平凡 上海交通大学 The Riemann problem of Burgers equation with discontinuous source term		邓淑芳 华东理工大学 The solutions for the cylindrical KP equation	陈登远

2010年11月7日(周日)

时间	椭圆、抛物方程: J101		双曲方程、数值方法: J202		孤子与可积系统: J201	
	报告人\题目	主持人	报告人\题目	主持人	报告人\题目	主持人
11:10-11:30	张伟 中国科技大学 Convexity for the smallest principal curvature of level sets of harmonic functions with respect to the height	王远弟	刘见礼 上海大学 Goursat problem for the first-order quasilinear hyperbolic systems	张挺	罗琳 上海第二工业大学 Binary Bell polynomial approach to integrable nonlinear equations [陈登远
11:30-11:50	赵发友 上海大学 m-线性 Hardy 算子和 Hilbert 算子的最佳的界		王钦 上海交通大学 Homogeneous Boundary Problems for Degenerate Parabolic-Hyperbolic Equations			
11:50-12:00	闭幕式(地点:J202)					

报告题目及摘要

2010 年度长江三角洲偏微分方程会议报告汇总

2010 年 11 月 05 日至 07 日, 上海, 中国

报告题目及摘要

题目: **Homogenization, Nonlocal effects and kinetic equations**

报告人: R. Alexandre 上海交通大学

摘要: We will describe some examples of asymptotic process in kinetic equations giving some non local effects for the position variable. These effects can be non fractional derivatives, or memory type.

题目: **Existence, uniqueness and stability of traveling waves of a mean curvature equation**

报告人: 蔡静静 同济大学

摘要: This talk consider the traveling waves of a parabolic equation with Neumann boundary conditions. We show that they are unique up to space shifts (or time shifts) when the boundary condition is time -dependent (or space-dependent), they are stable and asymptotically stable. The average traveling speeds and the instantaneous speeds are also studied. Our analysis shows that there is much difference between the speeds when boundary condition is time-dependent and space- dependent.

题目：Symmetries for the Ablowitz-Ladik hierarchy

报告人：陈守婷 上海大学

摘要： In this paper we consider symmetries related to the Ablowitz-Ladik (AL) hierarchy. We first investigate symmetries of isospectral and non-isospectral four-potential AL hierarchies. The symmetries, respectively, form two centerless Kac-Moody-Virasoro algebras. Besides, we make clear for the relation between four-potential and two-potential AL hierarchies. We derive symmetries for the integrable discrete nonlinear Schrödinger (IDNLS) hierarchy and discrete AKNS (DAKNS) hierarchy. The IDNLS hierarchy are in scalar form and its two sets of symmetries are shown to form a Lie algebra. The DAKNS flows we presented form a Lie algebra which plays a key role in constructing symmetries and their algebraic structures for both the IDNLS hierarchy and DAKNS hierarchy. The difference between the discrete algebraic structure and the continuous case are explained through continuous limit and degree in terms of lattice spacing parameter h .

题目：Curvature estimates for the level sets of spatial quasiconcave solutions to a class of parabolic equations

报告人：陈传强 中国科技大学

摘要： We prove a constant rank theorem for the second fundamental form of the spatial convex level surfaces of solutions to equations $u_t = F(n^2u, nu, u, t)$ under a structural condition, and give a geometric lower bound of the principal curvature of the spatial level surfaces.

题目：Recursion operators for KP, mKP and Harry-Dym Hierarchies

报告人：程纪鹏 中国科技大学

摘要： In this paper, we give a unified construction of the recursion operators from the Lax representation for three integrable hierarchies: Kadomtsev-Petviashvili (KP), modified Kadomtsev-Petviashvili (mKP) and Harry-Dym under n -reduction. This shows a new inherent relationship between them. To illustrate our construction, the recursion operator are calculated explicitly for 2-reduction and 3-reduction.

题目: **The solutions for the cylindrical KP equation**

报告人: 邓淑芳 华东理工大学

摘要: The decay mode solutions for the cylindrical KP equation are obtained by Hirota method and Backlund transformation.

题目: **On the weak-strong uniqueness of the 2D dissipative quasi-geostrophic equation**

报告人: 董柏青 安徽大学

摘要: In this talk, we will show the weak-strong uniqueness of a two dimensional dissipative quasi-geostrophic equation. If θ and $\tilde{\theta}$ are two weak solutions of the quasi-geostrophic equation initially from the same function $\theta(0) = \tilde{\theta}(0) \in L^2(\mathbb{R}^2)$ and the weak solution θ is subject to the condition

$$\nabla\theta \in L^r(0, T; B_{p, \infty}^0(\mathbb{R}^2)) \quad \text{for } \frac{2}{p} + \frac{\alpha}{r} = \alpha, \quad \frac{2}{\alpha} < p < \infty, \quad 0 < \alpha \leq 2,$$

then $\theta = \tilde{\theta}$ on $\mathbb{R}^2 \times [0, T]$. Additionally, with the use of the weak-strong uniqueness, we also examine the weak solution θ is asymptotic stable with respect to large initial data and external forcing perturbations.

题目: **超对称方程的可积性 — 超 Bell 多项式方法**

报告人: 范恩贵 复旦大学

摘要: 我们引入一类新的广义超 Bell 多项式, 通过这类超 Bell 多项式的性质, 建立起超 Bell 多项式与超对称方程之间的密切联系。由此, 我们提出基于超 Bell 多项式, 系统构造超对称方程的双线性表示、双线性 Backlund 变换、Lax 对和无穷守恒律的一种简洁、快速的有效代数方法。

题目：关于节点状态的精确边界能控性

报告人：顾琪龙 上海交通大学

摘要：首先，利用构造性方法，得到了一维情况下的一阶拟线性双曲组的一种精确边界能控性 – 关于节点状态的精确边界能控性，即对于任意给定的初值，要求找到能空时间 T ，是的当 $t \geq T$ 时，通过边界控制，在某个节点处达到事先给定的状态。随后，我们将这一结果推广到具一般拓扑结构的树状网络上。对于一般的一阶拟线性双曲组，以及一般的非线性边界条件与连接条件，建立了树状网络上的关于节点状态的精确边界能控性的基本模型。我们给出了事先给定的节点状态所需满足的相容性条件，同时给出了对照给定的节点状态选择相应的控制量的方法。对于具体的物理模型，我们对具有特殊性质的连接条件进行进一步的分析，并得到了一些有意义的结果。需要说明的是，由于拟线性双曲组通常不具有整体解，我们这里所考虑的关于节点状态的精确边界能控性都是在局部意义下的，即初值、边界条件、给定的节点状态和所选的控制量都具有某种小性。

题目：Stability to the incompressible Navier-Stokes equations

报告人：桂贵龙 江苏大学

摘要：In this talk, we consider stability to the global large solutions of the incompressible inhomogeneous Navier-Stokes equations. First, we investigate the global stability to any given solution of the Navier-Stokes system when the initial density is close to 1. Then, in the general case, we prove the decay estimates and the uniform estimates for the reference solution. From this, the global stability to any given large solution of the Navier-Stokes system with large density is obtained. Moreover, we demonstrate the existence and uniqueness of global smooth solutions to the Navier-Stokes equations.

题目： Rogue wave for variable coefficient soliton equations

报告人：贺劲松 宁波大学

摘要： In this talk, the variable coefficient nonlinear Schrödinger equation(VCNLSE) and derivative nonlinear Schrödinger equation(VCDNLSE) are discussed. By using a transformation which maps a VCNLSE(or VCDNLSE) to the well known usual NLSE(or DNLSE) equation, the rogue wave and soliton solutions of the former are given from known solutions of the latter. Several figures for these solutions are plotted to understand intuitively its dynamical evolution. This is a joint work with Prof. Yishen Li and my students(Shuwei Xu and Youying Wan).

题目： Constant Rank Theorem Of The Spacetime Convex Solution Of Heat Equation

报告人：胡波文 中国科技大学

摘要： We first introduce some related developments on the study of convexity of partial differential equations, especially on the microscopic convexity. Then we shall state and prove a constant rank theorem of the spacetime Hessian of the spacetime convex solution of heat equation.

题目： 公司债券的优化定价及其 Bellman 方程

报告人：胡顺泰 同济大学

摘要： 本文利用效用无差异优化方法讨论可违约债券的定价问题。假设公司股票价格的运行规律以 CEV 模型描述，公司的违约使用约化模型刻画，而投资者对于风险的厌恶由效用函数的凹性反映。我们考虑两个最优投资问题，一个拥有该张公司债券，另一个不持有，通过比较这两个问题的解，求得可违约债券的价格。本文建立了与最优投资问题相关的 HJB 方程，研究 HJB 方程的性质，进行数值模拟，并讨论了可违约债券价格和各参数的关系。

题目: Global solutions of one-dimensional nonlinear thermoelasticity with second sound

报告人: 胡玉玺 上海交通大学

摘要: 本文给出了带第二声的热弹性力学初边值问题的整体解的存在性。我们考虑的问题是一维无界区域。首先, 我们利用傅里叶变换, 给出了线性化方程的解的衰减估计。并且利用一阶对称双曲方程组的性质给出了解的存在性证明。接着, 我们利用能量方法给出了解的 L^1 和 L^2 估计。由此便得到解的整体存在性。

题目: A variational method for Real Ultrasound Image Despeckling using a primal dual algorithm

报告人: 黄杰 南京理工大学

摘要: Speckle appears in all conventional ultrasound images, and it generally tends to reduce the image resolution and contrast, thereby reducing the diagnostic value of the imaging modality. In this paper, we focus on the problem of real ultrasound image despeckling. Inspired by the real ultrasound image model, we develop a new variational model by employing I-divergence as data fitting term. By applying a log-transformation, we get a strictly convex object functional and a new despeckling model. The existence and uniqueness of the minimizer of the variational problem can be easily obtained and we also study the solution for the associated evolution problem. Then, We use a primal and dual combination algorithm to solve our TV involved problem. At last, we show the capability of our model on some numerical experiments.

题目：Dirichlet problems of Monge-Ampère type equations arising from optimal transportation

报告人：蒋飞达 南京理工大学

摘要：In this paper, the existence of the globally smooth solutions for the Dirichlet problem of the Monge-Ampère type equations arising from optimal transportation is concerned. Several priori estimates of the second order derivative bounds are obtained both on the boundary and in the interior of the domain. The existence of classical solutions is obtained by assuming the existence of subsolutions via the classical continuity method. The interpretations to optimal transportation problems are indicated.

题目：双曲几何流及其应用

报告人：孔德兴 浙江大学

摘要：In this talk, we talk about some new equations arising from geometry and physics, some of the discoveries that have been done about it, and some unresolved questions.

题目：Approximations of higher order evolution equations

报告人：梁进 上海交通大学

摘要：This talk gives some general approximation theorems for the propagators of higher order evolution equations, which covers the well-known Trotter-Kato approximation theorem for strongly continuous operator semigroups. Applications are also given to illustrate the abstract criteria.

题目: **Asymptotic Stability of Rarefaction Waves in Radiative Hydrodynamics**

报告人: 林春进 河海大学

摘要: In this talk we study the asymptotic stability of rarefaction waves for solutions to a one-dimensional radiative hydrodynamic system which couples hyperbolic-elliptic equations. We assume that the initial data tend to constant states at $x = \pm\infty$, respectively, and the corresponding Riemann problem for the compressible Euler equations admits a continuous rarefaction wave solution with small strength. If the initial perturbation is small, the solution is proved to tend to the rarefaction wave as $t \rightarrow +\infty$. The proof is based on the L^2 -energy method and elliptic estimates.

题目: **Goursat problem for the first-order quasilinear hyperbolic systems**

报告人: 刘见礼 上海大学

摘要: 这次报告给出了拟线性双曲组在弱线性退化及严格双曲情况下, *Goursat* 边值衰减时的整体经典解, 并给出了整体经典解的逐点估计。

题目: **平均逼近奇异扰动的阻尼非线性随机波动方程**

报告人: 吕艳 南京理工大学

摘要: An averaging method is applied to derive effective approximation to the following singularly perturbed nonlinear stochastic damped wave equations

$$\nu u_{tt} + u_t = Du + f(u) + \nu^\alpha \dot{W} \quad (1)$$

on an open bounded domain $D \subset R^n$, $1 \leq n \leq 3$. Here $\nu > 0$ is a small parameter describing the singular perturbation and ν^α , $0 \leq \alpha \leq 1/2$, describes the strength of noise. Some scaled transformations and a martingale approximation discussion yield the following effective approximation for small $\nu > 0$

$$u_t = Du + f(u) + \nu^\alpha \dot{W} \quad (2)$$

up to error of $\mathcal{O}(\nu^\alpha)$.

题目：部分耗散拟线性双曲型方程组的整体经典解

报告人：曲鹏 复旦大学

摘要：一般来讲，一维拟线性双曲型方程组的经典解会在有限时间内产生奇性，而弱线性退化条件和一定的耗散非齐次项是常见的两个阻止奇性产生的重要结构，即若系统的所有特征均为弱线性退化的，或者均具有适当的耗散，则对小而衰减的初值，系统存在整体经典解。由于物理模型的要求，我们还需要讨论两种特征混合的问题。本次报告将讨论这样的一类系统，其部分特征具有适当的耗散性质，而其余特征是弱线性退化的，我们将在适当的耦合条件下证明这类系统对小而衰减的初值存在整体经典解。这一工作是由复旦大学刘存明与报告者合作完成的。

题目：Journe 型奇异积分算子在多参数 Hardy 空间上有界的判别准则

报告人：阮卓娉 南京大学

摘要：这个报告是考虑与多参数伸缩族相关的算子。我们特别关注 Journe 型奇异积分算子在多参数 Hardy 空间上的有界性。Pipher 证得了这些算子从多参数 Hardy 空间 H^p 到 L^p 空间的有界性。Journe 给出了一个反例来说明参数的个数在多参数 Hardy 空间中起着关键作用。我们给出了这些算子在任意多个参数情形下在多参数 Hardy 空间上具有有界性的充要条件。

题目：Binary bell polynomial approach to BLMP equation

报告人：罗琳 上海第二工业大学

摘要：In this talk, We extend binary Bell polynomial approach to investigate BLMP equations. Making use of the relation between binary Bell polynomial and D-operators, we obtain the bilinear Backlund transformations for the BLMP equation, which can be linearized into corresponding Lax pairs.

题目： Generalized solutions of three lattice equations in ABS list

报告人： 施英 上海大学

摘要： By investigating the conditions satisfied by the Casoratian basic column, we derive the limit solutions (Matveev solutions) to H2, H3 and Q1, as well as rational solutions to H3 and Q1, which are in the ABS-list. These generalized solutions are novel.

题目： The Boltzmann equation with potential force in the whole space

报告人： 孙杰 中国科技大学

摘要： The Cauchy problem of the Boltzmann equation with potential force in the whole space is considered. It will be showed that we can still obtain a unique global solution to the Boltzmann equation even for the hard potential cases by energy method when some more natural assumptions compared to those of the previous works are made on the potential force. Moreover, we will state uniform stability and optimal convergence rate of the solution.

题目： Two-point boundary value problems and exact controllability for several kinds of linear and nonlinear wave equations

报告人： 孙庆有 浙江大学

摘要： In this talk we introduce some new concepts for second-order hyperbolic equations: two-point boundary value problem, global exact controllability and exact controllability. For several kinds of important linear and nonlinear wave equations arising from physics and geometry, we prove the existence of smooth solutions of the two-point boundary value problems and show the global exact controllability of these wave equations. In particular, we investigate the two-point boundary value problem for one-dimensional wave equation defined on a closed curve and prove the existence of smooth solution which implies the exact controllability of this kind of wave equation. Furthermore, based on this, we study the two-point boundary value problems for the wave equation defined on a strip with Dirichlet or Neumann boundary conditions and show that the equation still possesses the exact controllability in these cases. Finally, as an application, we introduce the hyperbolic curvature flow and obtain a result analogous to the well-known theorem of Gage and Hamilton for the curvature flow of plane curves.

题目: **The Riemann problem of Burgers equation with discontinuous source term**

报告人: 唐平凡 上海交通大学

摘要:

题目: **超可积系统及其超 Hamiltonian 结构**

报告人: 陶司兴 上海大学

摘要: 利用李超代数 $B(0,1)$ 和屠格式构造了超 C-KdV 方程族、超经典 Boussinesq 方程族、超 Yang 方程族和超 GJ 方程族; 与此同时, 利用超迹恒等式给出了它们的超 Hamiltonian 结构。

题目: **Chemotaxis-Haptotaxis Systems**

报告人: 陶有山 东华大学

摘要: This talk first reviews/reports some new progress in the study of parabolic-parabolic chemotaxis systems. Secondly, this talk addresses chemotaxis-haptotaxis systems modeling cancer invasion of tissue. I will focus on the interplays between (self-)diffusion, cross-diffusion and logistic growth.

题目：The symmetric q-deformed KP hierarchy

报告人：田可雷 中国科技大学

摘要： This talk aims to give a brief description of the symmetric q-deformed Kadomtsev-Petviashvili (q-KP) hierarchy associated with the symmetric q-derivative operator. After introducing the dressing operator, q-wave function and the q-adjoint function, the tau function of the q-KP hierarchy is also given. Furthermore, we study additional symmetries and Virasoro constraints of the q-KP hierarchy.

题目：Homogeneous Boundary Problems for Degenerate Parabolic-Hyperbolic Equations

报告人：王钦 上海交通大学

摘要： In this talk we obtain the well-posedness (existence and uniqueness) result of entropy solutions to the anisotropic degenerate parabolic-hyperbolic equations with bounded initial data and homogeneous Dirichlet boundary conditions. We use the doubling of variables device to prove the uniqueness result. Moreover we can prove that the entropy solution can be obtained as the limit of solutions of regularized equations of nondegenerate parabolic type.

题目：Homoclinic Orbits for a Spatial-dependently Perturbed Nonlinear Schrodinger

报告人：王毅 中国科技大学

摘要： The existence of homoclinic orbits for nearly integrable Hamiltonian PDEs is closely related to Chaos. In this talk, we consider a certain diffusive perturbations of the integrable nonlinear Schrodinger equation under periodic boundary conditions. The spatial dependence of the damped-driven term and unboundedness of the diffusion destroy the invariance of the plane of constants and some geometric structures. We overcome these difficulties and prove the existence of homoclinic orbits for the perturbed NLS. This is a joint work with Shui-Nee Chow and Chongchun Zeng.

题目: Lie 群方法求解分数阶反常扩散方程

报告人: 吴国成 东华大学

摘要: The Lie group method provides an efficient tool to solving nonlinear partial differential equations. This report suggests a fractional partner for fractional partial differential equations. A space-time fractional diffusion equation is used as an example to illustrate the effectiveness of the Lie group method.

题目: Second order differential operators subject to Feller-Wentzell type boundary conditions

报告人: 肖体俊 复旦大学

摘要: We are concerned with second order differential operators subject to Feller-Wentzell type boundary conditions, which originates from the work of Feller [W. Feller, The parabolic differential equations and the associated semi-groups of transformations, Ann. of Math. (2) 55 (1952) 468-519]. Some related results are presented.

题目: 奇数维空间中带耗散结构波动方程解的衰减估计

报告人: 徐红梅 河海大学

摘要: We study the dissipation of solutions of the cauchy problem for the nonlinear dissipative wave equation in odd multi spatial dimensions. Pointwise estimate of the time asymptotic shape of the solutions are obtained and shown to exhibit generalized Huygens principle. Our approach is based on the detailed analysis of the green function of the linearized system. This is used to study the coupling of nonlinear diffusion waves.

题目：一类退化椭圆方程边值问题的径向解

报告人：许孟 南京理工大学

摘要：The radial solutions of Neumann problem for nonlinear degenerate elliptic equation

$$-\operatorname{div}((|x| - \varepsilon)^\alpha |u|^\beta |Du|^\gamma Du) = \lambda c(|x|) |u|^\delta u \quad (*)$$

on an annular domain $\Omega = \{x \in \mathcal{R}^N : \varepsilon < |x| < R\}$ under the appropriate conditions are investigated in terms of an ODE approach and the change of variables. Some problems related to (*) are also considered.

题目：Sobolev 型不等式和临界指数问题

报告人：宣本金 中国科技大学

摘要：在这个报告中，我们首先回顾经典的 Sobolev 不等式及其最佳常数的达到函数在椭圆临界指数问题中的应用；然后，介绍推广的 Sobolev 不等式 -Caffarelli-Kohn-Nirenberg 不等式及其最佳常数的达到函数在带有奇异系数的椭圆临界指数问题中的应用；最后，对带有 Hardy 位势的 Caffarelli-Kohn-Nirenberg 不等式及其最佳常数的达到函数作进一步的探讨，给出它们在带有 Hardy 位势的椭圆临界指数问题中的应用。

题目：极值曲面方程 Lipschitz 解的适定性及渐近性

报告人：杨永富 河海大学

摘要：We show that in one space dimension Lipschitz solutions of extremal surface equations are equivalent to entropy solutions in $L^\infty(R)$ of a non-strictly hyperbolic system of conservation laws. We obtain an explicit representation formula and the uniqueness of the entropy solutions to the Cauchy problem of the system. By using this formula, we also obtain the convergence and convergence rates as $t \rightarrow +\infty$ of the entropy solutions to explicit traveling waves in the $L^1(R)$ norm. Moreover, when initial data are constants outside of a finite space interval, the entropy solutions become the explicit traveling waves after a finite time. Finally, we prove L^1 stabilities of the entropy solutions.

题目： Random data Cauchy theory for the generalized incompressible Navier–Stokes equations

报告人：张挺 浙江大学

摘要： In this talk, we consider the generalized Navier-Stokes equations where the space domain is \mathbb{T}^N or \mathbb{R}^N , $N \geq 3$. The generalized Navier-Stokes equations here refer to the equations obtained by replacing the Laplacian in the classical Navier-Stokes equations by the more general operator $(-\Delta)^\alpha$ with $\alpha \in (\frac{1}{2}, \frac{N+2}{4})$. After a suitable randomization, we obtain the existence and uniqueness of the local mild solution for a large set of the initial data in H^s , $s = -\alpha$, if $1 < \alpha < \frac{N+2}{4}$, $s \in (1 - 2\alpha, 0)$, if $\frac{1}{2} < \alpha \leq 1$. Furthermore, if $\|u_0\|_{H^s}$ is small, we show that the probability for the global existence and uniqueness of the solution is large. Specially, our result shows that, in some sense, the Cauchy problem of the classical Navier-Stokes equation is local well-posed for a large set of the initial data in H^{-1+} , exhibiting a gain of $\frac{N}{2}-$ derivatives with respect to the critical Hilbert space $H^{\frac{N}{2}-1}$.

题目： Convexity for the smallest principal curvature of level sets of harmonic functions with respect to the height

报告人：张伟 中国科技大学

摘要： For the p -harmonic function with strictly convex level sets, we find a test function which comes from the combination of the norm of gradient of the p -harmonic function and the smallest principal curvature of the level sets of p -harmonic function. We prove that this curvature function is convex with respect to the height of the p -harmonic function. This test function is an affine function of the height when the p -harmonic function is the p -Green function on the ball.

题目: **m- 线性 Hardy 算子和 Hilbert 算子的最佳的界**

报告人: 赵发友 上海大学

摘要: The precise norms of m-linear Hardy operators and m-linear Hilbert operators on Lebesgue spaces with power weights are computed. Analogous results are also obtained for Morrey spaces and central Morrey spaces.

题目: **Direct linearization method and Cauchy matrix method**

报告人: 赵松林 上海大学

摘要: This report is a short introduction of two methods: direct linearization method and Cauchy matrix method.

题目: **Remark on Camassa-Holm Equation**

报告人: 周统 上海交通大学

摘要: The Camassa-Holm equation, as an integrable system, was proposed by Fokas and Fuchssteiner (1980), and has been interesting because of the famous work of Camassa and Holm (1993). However, recently the system dose not represent a long wave asymptotic according to the expanding theory of Bhatt and Mikhailov. The authors point out a inconsistency with the theory of shallow water waves.

题目：非等谱 KPI 方程的波浪解

报告人：朱晓明 上海大学

摘要：通过反散射变换得到非等谱 KPI 方程 N 孤子解，并讨论了单孤子的动力学性质。

题目：Euler equations related to the generalized Neveu-Schwarz algebra

报告人：左达峰 中国科技大学数学系

摘要：In this talk, we will report Euler equations related to the generalized Neveu-Schwarz algebra, including supersymmetric Euler equations and bi-superhamiltonian Euler equations. Especially, we will propose several supersymmetric or bi-superhamiltonian generalizations of some well-known integrable systems including the coupled KdV equation, the 2-component Camassa-Holm equation and the 2-component Hunter-Saxton equation. To our knowledge, most of them are new.