**应用中的偏微分方程线上研讨咨询会**

**会议日程**

**复旦大学数学科学学院、复旦大学应用数学中心、上海市现代应用数学重点实验室**

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| **11月29日（周三）** | **腾讯会议号：783 741 32866 密码：200433** |
| **8:55—9:00** | **会议开幕** |
| 9:00—10:00 | 报告人： 阮立志 教授（华中师范大学）标题：消元法与偏微分方程的求解 | 主持人：王焰金 教授（厦门大学） |
| 10:00—11:00 | 报告人： 罗天文 教授（华南师范大学）标题：On multi-dimensional rarefaction waves |
| **午休** |
| **13:30—14:30** | **自由讨论** |

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| **11月30日（周四）** | **腾讯会议号：783 741 32866密码：200433** |
| 9:00—10:00 | 报告人：童嘉骏 教授（北京大学）标题：Global Well-Posedness of the 2-D Peskin Problem under Geometric Conditions | 主持人：曲鹏 教授（复旦大学） |
| 10:00—11:00 | 报告人：邓师瑾 教授（上海交通大学）标题：Global Solution of 3-D Patlak-Keller-Segal Model with a Couette Flow in Whole Space |
| **午休** |
| **13:30—14:30** | **自由讨论** |

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| **12月1日（周五）** | **腾讯会议号：783 741 32866密码：200433** |
| 9:00—10:00 | 报告人：董世杰 教授（南方科技大学）标题：Cubic Dirac equations with a class of large data | 主持人：蔡圆 研究员（复旦大学） |
| 10:00—11:00 | 报告人：袁谦 研究员（中国科学院数学与系统科学研究院）标题：Nonlinear asymptotic stability of compressible vortex sheets with viscosity effects |
| **11:00—11:10** | **会议闭幕** |

会议组织：

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报告摘要

报告人： 邓师瑾 教授（上海交通大学）

标题：Global Solution of 3-D Patlak-Keller-Segal Model with a Couette Flow in Whole Space

摘要：We consider both parabolic-elliptic Patlak-Keller-Segel model and parabolic-parabolic Patlak-Keller-Segel model in the background of a Couette flow with spatial variables in R^3. It is proved that for both parabolic-elliptic and parabolic-parabolic cases, a Couette flow with sufficiently large amplitude prevents the blow-up of solutions. This result is totally different from either the classical Patlak-Keller-Segel model or the case with a large shear flow and the periodic spatial variable x; for those two cases, the solution may blow up. Here, we apply Green's function method to capture the suppression of blow-up and prove the global existence of the solutions. It is a joint-work with Dr. Binbin Shi and Prof. Weike Wang.

报告人： 董世杰 教授（南方科技大学）

标题：Cubic Dirac equations with a class of large data

摘要：We are interested in massless cubic Dirac equations in two and three space dimensions, known as the Soler model. We aim to show global existence and asymptotic behaviour for this model with a class of large initial data. This is joint with Kuijie Li and Jingya Zhao.

报告人： 罗天文 教授（华南师范大学）

标题：On multi-dimensional rarefaction waves

摘要：We study the two-dimensional acoustical rarefaction waves under the irrotational assumptions. We provide a new energy estimates without loss of derivatives. We also give a detailed geometric description of the rarefaction wave fronts. As an application, we show that the Riemann problem is structurally stable in the regime of two families of rarefaction waves. This is a joint work with Prof. Pin Yu in Tsinghua Univerisity.

报告人： 阮立志 教授（华中师范大学）

标题：消元法与偏微分方程的求解

摘要: 我们首先回顾消元法的几个经典实例, 然后主要介绍消元法在某些非线性偏微分方程 (如辐射Euler方程等) 中的应用。

报告人： 童嘉骏 教授（北京大学）

标题：Global Well-Posedness of the 2-D Peskin Problem under Geometric Conditions

摘要：The 2-D Peskin problem describes coupled motion of a 1-D closed elastic string and the ambient Stokes flow in the plane. Its global well-posedness has been well-established when the initial string configuration is close to an equilibrium, which is an evenly-stretched circular configuration. In other words, initial shape of the string needs to be almost circular, and the string is almost evenly-stretched. In this talk, we present some recent progress on pursuing global solutions for a wider class of initial datum. We will show that certain geometric quantities of the string satisfy extremum principles and decay estimates. As a result, we can prove global well-posedness when the initial data satisfies a medium-size geometric condition on the string shape, while no assumption on the size of stretching is needed. This talk is based on a joint work with Dongyi Wei.

报告人： 袁谦 教授（中国科学院数学与系统科学研究院）

标题：Nonlinear asymptotic stability of compressible vortex sheets with viscosity effects

摘要：It is well known that the vortex sheets are generally unstable for the inviscid flows. In this talk, I will show that for the compressible isentropic Navier-Stokes equations, the vortex sheets are only meta-stable with the viscosity effects, while the associated viscous waves are time-asymptotically stable in the L^\infty space to small initial perturbations. Also, the optimal decay rates can be obtained. The results are independent of the spatial dimension and the amplitude of the flow. The proof is based on the L^2-energy method with the aid of the anti-derivative technique.