

Workshop on Nonlinear Partial Differential Equations XII

May. 14-May. 16, 2021

1. Workshop Information

Announcement:

In order to enhance the communications among the mathematicians on the subject of partial differential equations, geometric analysis and related topics, we plan to hold “Workshop on Nonlinear Partial Differential Equations XII” on May. 14-May. 16, 2021. We will invite some experts to share ideas and results on recent research, and discuss current challenging issues.

Organizing committee:

Mijia Lai, Shanghai Jiao Tong University
Congming Li, Shanghai Jiao Tong University
Fang Wang, Shanghai Jiao Tong University
Kai Zhang, Shanghai Jiao Tong University
Chunqin Zhou, Shanghai Jiao Tong University

Venue:

Room 706, No. 6 Building, Science Buildings
Minhang Campus
Shanghai Jiao Tong University
800 Dongchuan Road

Hotel:

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2. Schedule

May. 15, Saturday	
Room 706, No. 6 Building, Science Buildings (理科楼群 6 号楼)	
8: 50-9: 00	Opening ceremony
9: 00-9: 50	<p>Speaker: Yuan Zhou (周渊)</p> <p>Chair: Chunqin Zhou (周春琴)</p> <p>Title: A new proof for Savin's Liouville theorem for infinity harmonic functions in plane</p>
10: 00-10: 50	<p>Speaker: Jingbo Dou (窦井波)</p> <p>Chair: Chunqin Zhou (周春琴)</p> <p>Title: Sharp weighted Sobolev inequality involving divergent operator with degeneracy and related sharp inequalities</p>
10: 50-11: 10	Tea break
11: 10-12: 00	<p>Speaker: Kai Zhang (张凯)</p> <p>Chair: Yutian Lei (雷雨田)</p> <p>Title: Boundary pointwise regularity and application to the regularity of free boundary problems</p>
12: 00-14: 30	Lunch (703, 披萨、水果、零食)
Afternoon	
14: 30-15: 20	<p>Speaker: Chuanqiang Chen (陈传强)</p> <p>Chair: Fang Wang (王芳)</p> <p>Title: Quermassintegral inequalities in the Sphere</p>
15: 20-15: 40	Tea break
15:40-16: 30	<p>Speaker: Weiming Shen (沈伟明)</p> <p>Chair: Mijia Lai (来米加)</p> <p>Title: The Loewner-Nirenberg problem in singular domains and cones</p>
16: 40-17: 30	<p>Speaker: Huihuang Zhou (周辉煌)</p> <p>Chair: Mijia Lai (来米加)</p> <p>Title: Note on the compactness of conformally compact Einstein manifold</p>
17: 30-18: 00	Free discussion
18: 00	Banquet (Academic Activity Center)

3. Titles and Abstracts

(1) Title: Quermassintegral inequalities in the Sphere

Speaker: Chuanqiang Chen (Ningbo University)

Abstract: In this talk, we will introduce the quermassintegral inequalities in the Euclidean space and Hyperbolic space. At last, we introduce some results about quermassintegral inequalities and a geometric flow in the Sphere, which is a joint work with Pengfei Guan, Junfang Li and Julian Scheuer.

(2) Title: Sharp weighted Sobolev inequality involving divergent operator with degeneracy and related sharp inequalities

Speaker: Jingbo Dou (Shaanxi Normal University)

Abstract: In this talk we present the classification of all positive extremal functions to a sharp weighted Sobolev inequality on the upper half space, which involves divergent operators with degeneracy on the boundary. We show that such a weighted Sobolev inequality can be used to derive a sharp Sobolev type inequality involving Baouendi-Grushin operator, and deduce others weighted inequalities. This work joins with Liming Sun, Lei Wang and Meijun Zhu.

(3) Title: The Loewner-Nirenberg problem in singular domains and cones

Speaker: Weiming Shen (Capital Normal University)

Abstract: First, we will talk about asymptotic behaviors of solutions of the Loewner-Nirenberg problem in singular domains and prove that the solutions are well approximated by the corresponding solutions in tangent cones at singular points on the boundary. Then we talk about asymptotic behaviors of solutions to the Loewner-Nirenberg problem in finite cones and establish optimal asymptotic expansions in terms of the corresponding solutions in infinite cones. The spherical domains over which cones are formed are allowed to have singularities.

This talk is based on joint works with Professor Qing Han, and with Professor Qing Han, Xumin Jiang.

(4) Title: Boundary pointwise regularity and application to the regularity of free boundary problems

Speaker: Kai Zhang (Shanghai Jiao Tong University)

Abstract: In this talk, we present the boundary pointwise regularity for uniformly elliptic equations. Based this pointwise regularity, we give a simple and direct proof of the regularity of free boundaries in obstacle-type problems.

(5) Title: Note on the compactness of conformally compact Einstein manifold

Speaker: Huihuang Zhou (Shanghai Jiao Tong University)

Abstract: Given a sequence of conformally compact Einstein manifold with a compact family of metrics on boundary, we are interested in the compactness issue. Recently Chang-Ge-Qing proved some compactness results of conformally compact Einstein metric on 4-dimensional manifold with Fefferman-Graham compactification. In this talk, we consider the original compactification and the adapted compactification. We prove the equivalence of compactness between the two compactifications.

(6) Title: A new proof for Savin's Liouville theorem for infinity harmonic functions in plane

Speaker: Yuan Zhou (Beijing Normal University)

Abstract: Via planar topology Savin 2005 proved C^1 -regularity for planar infinity harmonic function. Using this and a compactness argument he further established a Liouville theorem: If an infinity harmonic function in plane has linear growth, then it must be given by $a \cdot x + b$ for some constant b and vector a . We give a new proof for this via a second order regularity but without using C^1 -regularity and planar topological argument.

4. List of Participants

Name	Affiliation
陈传强	宁波大学
窦井波	陕西师范大学
蒋国盛	北京大学
来米加	上海交通大学
雷雨田	南京师范大学
李从明	上海交通大学
李振杰	上海交通大学
廉媛媛	上海交通大学
梁警琦	上海交通大学
刘宸恺	上海交通大学
吕英姝	复旦大学
牛亚婷	复旦大学
沈伟明	首都师范大学
王芳	上海交通大学
王丽丹	上海交通大学
王邵东	上海交通大学
谢春景	上海交通大学
徐美清	上海交通大学
杨帆	上海交通大学
张凯	上海交通大学
周春琴	上海交通大学
周辉煌	上海交通大学
周渊	北京师范大学
卓然	上海交通大学