

一、会议信息

学术委员会：

方复全 李安民 田刚 张伟平

组织委员会：

葛建全（北京师范大学）

宋翀（厦门大学）

夏超（厦门大学）

彦文娇（北京师范大学）

张振雷（首都师范大学）

邀请报告人：

陈世炳（中国科学技术大学） 郭 帅（北京大学）

贺 飞（厦门大学） 黄立鼎（西湖大学）

黄 勇（湖南大学） 蒋仁进（天津大学）

李奇睿（浙江大学） 刘 博（华东师范大学）

刘 毅（北京大学） 罗 勇（重庆理工大学）

马世光（南开大学） 钱 超（北京理工大学）

盛 利（四川大学） 孙 俊（武汉大学）

汪志威（北京师范大学） 王 芳（上海交通大学）

王国祯（复旦大学） 王 鹏（福建师范大学）

王险峰（南开大学） 王相生（山东大学）

吴云辉（清华大学） 叶 剑（中国科学院）

伊泽霖（同济大学）

二、日程表

日期	时间	事项	主持人
11月 25日	全天	登记入住酒店, 签到、领会议材料 (厦门宾馆8号楼大堂)	
	18:00	晚餐 (8号楼2楼海上明珠厅)	
11 月 26 日	08:00-08:30	开幕式 (8号楼3楼广益厅)	
	08:30-09:15	王国祯 (复旦大学) : Computations of topological cyclic homology (线下)	彦文娇
	09:20-10:05	刘博 (华东师范大学) : The real analogue of the holomorphic torsion form: Bismut-Cheeger eta form (线下)	
	10:05-10:25	茶歇	
	10:25-11:10	王相生 (山东大学) : Index theory and the PSC: Llarull's theorem and its generalizations (线上)	葛化彬
	11:15-12:00	伊泽霖 (同济大学) : Enlargeable foliations and the Monodromy groupoid. (线下)	
	12:00	午餐 (8号楼2楼海上明珠厅)	
	14:00-14:45	黄勇 (湖南大学) : Brunn-Minkowski Theory and Minkowski problems (线上)	葛建全
	14:50-15:35	蒋仁进 (天津大学) : Riesz transform on manifolds with ends of different volume growth (线上)	
	15:35-15:55	茶歇	
	15:55-16:40	钱超 (北京理工大学) : On James' questions about octonionic Stiefel spaces and generalizations (线上)	许小卫
	16:45-17:30	黄立鼎 (西湖大学) : Fully non-linear elliptic equations on compact almost Hermitian manifolds (线下)	
	17:30	晚餐 (8号楼2楼海上明珠厅)	

日期	时间	事项	主持人
11 月 27 日	08:30-09:15	刘毅（北京大学）：Finite-volume hyperbolic 3-manifolds are almost determined by their finite quotient groups（线上）	刘钢
	09:20-10:05	盛利（四川大学）：Extremal Metrics on Toric Manifolds and Homogeneous Toric Bundles（线下）	
	10:05-10:25	茶歇	
	10:25-11:10	王芳（上海交通大学）：On the spectrum of conformally compact Einstein manifold（线上）	江文帅
	11:15-12:00	吴云辉（清华大学）：Recent progress on first eigenvalues of hyperbolic surfaces for large genus（线上）	
	12:00	午餐（8号楼2楼海上明珠厅）	
	14:00-14:45	李奇睿（浙江大学）：On the L_p -Minkowski problem with super-critical exponents.（线上）	朱保成
	14:50-15:35	汪志威（北京师范大学）：Linear isometric invariants of bounded domains and their plurisubharmonic variation（线上）	
	15:35-15:55	茶歇	
	15:55-16:40	罗勇（重庆理工大学）：A new characterization of the Calabi torus in the unit sphere（线上）	张宁
16:45-17:30	贺飞（厦门大学）：Regularity of the gradient flow of a spinorial functional（线下）		
18:00	晚宴（大丰苑）		

日期	时间	事项	主持人
11 月 28 日	08:30-09:15	陈世炳（中国科学技术大学）：Regularity theory in optimal transportation（线上）	张会春
	09:20-10:05	马世光（南开大学）：Estimates of the boundary dimensions of a domain with a complete conformal metric（线上）	
	10:05-10:25	茶歇	
	10:25-11:10	王险峰（南开大学）：Self-similar solutions to fully nonlinear curvature flows by high powers of curvature（线上）	李琼玲
	11:15-12:00	孙俊（武汉大学）：Symplectic critical surfaces and related evolution equations（线上）	
	12:00	午餐（5号楼1楼沁园中餐厅）	
	14:00-14:45	郭帅（北京大学）：Genus one Virasoro Conjecture for Fano complete intersections in projective spaces（线上）	华波波
	14:50-15:35	叶剑（中国科学院）：On closed vacuum static spaces（线上）	
	15:35-15:55	茶歇	
	15:55-16:40	王鹏（福建师范大学）：On the geometry and topology of Willmore surfaces（线上）	张振雷
17:30	晚餐（8号楼2楼海上明珠厅）		
11月 29日	离会		

三、学术报告题目与摘要

Regularity theory in optimal transportation

陈世炳（中国科学技术大学）

In this talk, we will introduce our works related to the regularity theory of optimal transportation during the last few years. In particular, we will discuss our results concerning the global regularity of optimal transport maps, higher order regularity of free boundaries in optimal transportation, and regularity of singular set in optimal transportation. This is based on joint works with Jiakun Liu and Xu-Jia Wang.

Genus one Virasoro Conjecture for Fano complete intersections in projective spaces

郭帅（北京大学）

Virasoro constraints is a remarkable conjectural structure in Gromov-Witten theory. In many cases, it uniquely determine the higher genus Gromov-Witten invariants from lower genus invariants recursively. In this talk, we will briefly introduce its history, and known results. In the end we will introduce some recent progress in the genus one case for the Fano complete intersections in projective spaces. Part of this talk is based on the joint work with Qingsheng Zhang and Yang Zhou.

Regularity of the gradient flow of a spinorial functional

贺飞（厦门大学）

In this talk I'll introduce the gradient flow of a spinorial energy functional first studied by Ammann, Weiss and Witt, which was aimed to find parallel spinors. I'll present Shi's type regularity estimates for this flow and its relation with the Ricci flow. This talk is based on joint work with Changliang Wang.

Fully non-linear elliptic equations on compact almost Hermitian manifolds

黄立鼎（西湖大学）

We will talk about a priori estimates for solutions of a general class of fully non-linear equations on compact almost Hermitian manifolds. As an application, we will solve the complex Hessian equation and the Monge--Ampère equation for $(n-1)$ -plurisubharmonic equations in the almost Hermitian setting. We will also show the second order estimates for the fully nonlinear elliptic equations with gradient terms, including the deformed Hermitian-Yang-Mills equation and the equation in the proof of Gauduchon conjecture by Szekelyhidi-Tosatti-Weinkove. This is a joint work with Jianchun Chu and Jiaogen Zhang.

Brunn-Minkowski Theory and Minkowski problems

黄勇（湖南大学）

In this talk, we will give a survey about the history of Brunn-Minkowski theory and Minkowski problems. In particular, we introduce some main research topics of convex geometry analysis, and how to solve their problems by using PDE methods, for example, Aleksandrov's variational method, continuity method, geometric flow and so on.

Riesz transform on manifolds with ends of different volume growth

蒋仁进（天津大学）

We shall report some progress of Riesz transform on manifolds with ends of different volume growth. It is well known that doubling property plays an important role in analysis on manifolds, however, the doubling property fails in general, the manifolds with ends of different volume growth is a typical example. We report recent progress in the this direction regarding estimate of the heat kernels and Riesz transform property.

On the L_p -Minkowski problem with super-critical exponents.

李奇睿（浙江大学）

The L_p -Minkowski problem deals with the existence of closed convex hypersurface with prescribed p -area measure. The problem has been solved in the sub-critical case $p > n-1$, but remains widely open in the super-critical case $p < n-1$. In this talk, we introduce new ideas to solve the problem for all super-critical exponents. A crucial ingredient in the proof is a topological method based on the calculation of the homology of a topological space of ellipsoids. The talk is based on recent joint work with Qiang Guang and Xu-Jia Wang.

The real analogue of the holomorphic torsion form: Bismut-Cheeger eta form

刘博（华东师范大学）

The holomorphic torsion form is a key ingredient in arithmetic K-theory, which is the family extension of the holomorphic torsion introduced by Ray-Singer and well-studied by Bismut and his collaborators. By definition, the Bismut-Cheeger eta form, which lies in the real category, is totally different from the holomorphic torsion form. But it is amazing that they have similar properties. In this talk, we will show and discuss these similarities.

Finite-volume hyperbolic 3-manifolds are almost determined by their finite quotient groups

刘毅（北京大学）

In this talk, I will outline a proof for showing that the profinite completion of the fundamental group determines finite-volume hyperbolic 3-manifolds up to finitely many possibilities. As one of the main steps, I will explain why the Thurston norm on the first (real) cohomology is determined by the completion.

A new characterization of the Calabi torus in the unit sphere

罗勇（重庆理工大学）

In this talk we give new pinching phenomena of closed minimal Legendrian submanifolds in the unit sphere. Utilizing the maximum principle, we obtain a new characterization of the Calabi torus in the unit sphere which is the minimal Calabi product Legendrian immersion of a point and the totally geodesic Legendrian sphere. This is based on joint work with Prof. Linlin Sun and Dr. Jiabin Yin.

Estimates of the boundary dimensions of a domain with a complete conformal metric

马世光（南开大学）

Given a domain with a complete conformal metric on a compact manifold, if we impose some positive curvature assumptions, then we can deduce the Hausdorff dimension of the boundary has certain upper bound. In this talk, I will mention my recent results with Professor Jie Qing, which improve the result of Schoen-Yau and Chang-Qing-Yang.

On James' questions about octonionic Stiefel spaces and generalizations

钱超（北京理工大学）

In this talk, we will discuss two fundamental questions of James concerning with octonionic Stiefel spaces and generalizations. This is based on joint research with Prof. Zizhou Tang and Prof. Wenjiao Yan.

Extremal Metrics on Toric Manifolds and Homogeneous Toric Bundles

盛利（四川大学）

An example of Apostolov et al. indicate that the condition of K-stability may not be correct one for general polarised manifolds. Szekelyhidi modified definition of K-stability by filtration and stated a variant of the Yau-Tian-Donaldson conjecture. We will talk about our proof of this variant of YTD conjecture for toric manifolds and homogeneous toric bundles. This is jointed with Li An-Min and Lian Zhao.

Symplectic critical surfaces and related evolution equations

孙俊 (武汉大学)

In this talk, we will introduce a new family of functionals approaching to the existence of holomorphic curves in Kahler surface. We will study the properties of the critical points of the new functionals as well as the gradient flows. This is joint work with Xiaoli Han and Jiayu Li.

Linear isometric invariants of bounded domains and their plurisubharmonic variation

汪志威 (北京师范大学)

Given a bounded domain D and a positive number p , we denote by $A^p(D)$ the space of L^p holomorphic functions on D . In this talk, we will show that, under certain conditions, the complex structure of the domain is complete determined by the linear space $A^p(D)$, equipped with a norm, where p is not even. We also show that for $p < 2$, if D varies over a base space B , then the invariants $A^p(D)$ varies as a vector bundle over B with a Finsler metric with Griffiths semipositive curvature. This talk is based on joint works with Fusheng Deng, Jiafu Ning, Liyou Zhang, and Xiangyu Zhou.

On the spectrum of conformally compact Einstein manifold

王芳 (上海交通大学)

In this talk, I will introduce some recent results on the spectrum of conformally compact Einstein, including the bottom spectrum, the first real pole and the relation to the conformal geometry.

Computations of topological cyclic homology

王国祯（复旦大学）

Algebraic K theory for a field is the classification of vector spaces including higher homotopical information. The cyclotomic trace map from algebraic K theory to topological cyclic homology is a generalization of the Chern character which approximates K theory by ordinary homology. We will give an introduction to some new developments in the methods for computing topological cyclic homology and its applications.

On the geometry and topology of Willmore surfaces

王鹏（福建师范大学）

The study of Willmore functionals and Willmore surfaces in space forms lead to many important progresses in geometry and analysis. In this talk, we will discuss some recent progress on this topic, together with a brief review of the known related important results. This talk is based on various joint works with Profs. Dorfmeister, Kusner, Ying Lv, Xiang Ma, Pedit and Changping Wang.

Self-similar solutions to fully nonlinear curvature flows by high powers of curvature

王险峰（南开大学）

In this talk, we will discuss self-similar solutions to contracting curvature flows, which play an important role in the study of the asymptotic behaviors of mean curvature flow and flow by powers of the Gauss curvature. We will present some recent results on the uniqueness of self-similar solutions to a large family of fully nonlinear curvature flows by high powers of curvature. This is joint work with Dr. Shanze Gao and Prof. Haizhong Li.

Index theory and the PSC: Llarull's theorem and its generalizations

王相生（山东大学）

Llarull's theorem is a beautiful result about the PSC obtained by the index theory method. In this talk, I will recall several conjectures made by Gromov about the possible generalization of this theorem. Especially, I will discuss some recent progress about Llarull's theorem for the non-compact and foliated manifolds, which are joint works with with Guangxiang Su and Weiping Zhang.

Recent progress on first eigenvalues of hyperbolic surfaces for large genus

吴云辉（清华大学）

In this talk we will discuss several recent results on first eigenvalues of closed hyperbolic surfaces for large genus. For example, we show that a random hyperbolic surface of large genus has first eigenvalue greater than $\frac{3}{16} - \epsilon$, extending Mirzakhani's lower bound 0.0024 . This talk is based on several joint works with Yuhao Xue.

On closed vacuum static spaces

叶剑（中国科学院）

In this talk, we discuss closed vacuum static spaces. We firstly give several Bochner type formulas on vacuum static spaces. Based on a global argument, under the condition of zero radial Weyl curvature, we then obtain a pointwise identity and use it to prove that each closed vacuum static space of dimension at least five and zero radial Weyl curvature is Bach flat. Finally, we introduce the rigidity of positively curved closed vacuum static spaces.

Enlargeable foliations and the Monodromy groupoid.

伊泽霖（同济大学）

Let M be a spin manifold, the Dirac operator twisted by a flat Hilbert bundle determines a "Rosenberg index". It is a result of B.Hanke and T.Schick that the "Rosenberg index" subsumes the enlargeability obstruction to positive scalar curvature on M . In this talk, by following the same idea, I shall present a generalization to the foliation case with appropriate notion of enlargeability. We shall replace the Dirac operator by the leafwise Dirac operator on the foliation. The Monodromy groupoid will act as a substitution of universal covering upon which the twisting flat Hilbert bundle can be constructed. This is a joint work with Guangxiang Su.