

几何分析研讨会会议手册

北京·清华

2024年6月1-2日

一、日程安排

日期	时间	报告人	主持人	地点
6月1日	9:00-9:30	李皓昭	杨晓奎	理科楼 A112
	9:30-10:00	饶胜		
	10:00-10:30	茶 歇		阳光大厅
	10:30-11:00	金希深	马辉	理科楼 A112
	11:00-11:30	张良迪		
	11:30-12:00	石亚龙		
	12:00	午 餐		阳光大厅
	14:30-15:00	盛利	陈大广	理科楼 A112
	15:00-15:30	孟宪奎		
	15:30-16:00	茶 歇		阳光大厅
	16:00-16:30	邱红兵	徐国义	理科楼 A112
	16:30-17:00	黄昱涛		
	17:00-17:30	殷浩		
	17:30	晚 宴		万人三楼
6月2日	9:00-9:30	丁琪	李宇翔	理科楼 A112
	9:30-10:00	罗勇		
	10:00-10:30	茶 歇		阳光大厅
	10:30-11:00	汪志威	李宇翔	理科楼 A112
	11:00-11:30	陈学长		
	11:30-12:00	马世光		
	12:00	午 餐		阳光大厅
	14:30-15:00	孙俊	韩小利	理科楼 A112
	15:00-15:30	王险峰		
	15:30-16:00	茶 歇		阳光大厅
	16:00-16:30	毕宇晨	韩小利	理科楼 A112
	16:30-17:00	孙林林		

二、会议摘要（按报告顺序排列）

报告人：李皓昭（中国科学技术大学）

题目：Existence and convergence of Calabi flow

摘要：The Calabi flow, which was introduced by E. Calabi in 1982, is the gradient flow of the Calabi energy and it is a fourth order fully nonlinear parabolic flow of the Kahler potentials. In this talk, I will report some results on the long time existence and convergence of Calabi flow.

报告人：饶胜（武汉大学）

题目：On extension of closed complex (basic) differential forms

摘要：Inspired by a recent work of Dingchang Wei--Shengmao Zhu on the extension of closed complex differential forms and C. Voisin's usage of the $\partial\bar{\partial}$ -lemma, we obtain several new theorems of deformation invariance of Hodge numbers and reprove the local stabilities of \mathbb{C} -Kahler structures with the $\partial\bar{\partial}$ -lemma. Our approach more concerns about the \mathbb{C} -closed extension by means of the exponential operator $e^{\iota_{\varphi}}$. Furthermore, we prove the local stabilities of transversely \mathbb{C} -Kahler structures with mild $\partial\bar{\partial}$ -lemma by adapting the power series method to the foliated case, which strengthens the works of A. El Kacimi Alaoui--B. Gmira and P. Ra'zny on the local stabilities of transversely \mathbb{C} -Kahler structures. This talk is based on a joint work with Runze Zhang.

报告人：金希深（人民大学）

题目：Chern number inequalities related to deformed Hermitian-Yang-Mills metrics

摘要：In this talk, I will give relations between the deformed Hermitian-Yang-Mills metrics with supercritical phase and Chern number inequalities on four dimension Kaehler manifolds. This is a joint work with Han and confirms a conjecture of Collins and Yau.

报告人：张良迪（北京雁栖湖应用数学研究院）

题目：New curvature characterizations of spherical space forms and complex projective spaces

摘要：We introduce a new positivity notion for curvature of Riemannian manifolds and obtain characterizations for spherical space forms and the complex projective space. This talk is based on a joint work with Professor Xiaokui Yang.

报告人: 石亚龙 (南京大学)

题目: Green functions of GJMS operators on spheres, Gegenbauer polynomials and the rigidity problem

摘要: We derive explicit representation formulae of Green functions for GJMS operators on S^n using Gegenbauer polynomials. These formulae have natural geometric interpretations concerning the extrinsic geometry. We shall also discuss the corresponding rigidity problem for the Green functions. This is joint work with Xuezhong Chen.

报告人: 盛利 (四川大学)

题目: Extremal Metrics on Toric Manifolds

摘要: 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.

报告人: 孟宪奎 (北京邮电大学)

题目: A Converse to the Skoda L^2 Division Theorem

摘要: We present a converse to a stronger version of Skoda's L^2 division theorem by investigating the solvability of $\bar{\partial}$ equations of a specific type.

报告人: 邱红兵 (武汉大学)

题目: Bernstein type theorems of Lagrangian translating solitons and related problems

摘要: By carrying out refined point-wise estimates for the mean curvature, we prove better Bernstein type theorems of Lagrangian translating solitons, as well as symplectic translators. Furthermore, we shall discuss the Lawson-Osserman type problem of ancient solutions to the mean curvature flow in higher codimension.

报告人: 黄显涛 (中山大学)

题目: Transformation theorems for almost splitting maps and some applications

摘要: The almost splitting map is a powerful tool in studying manifolds with Ricci curvature uniformly bounded from below and their Gromov-Hausdorff limits. In this talk, we will introduce a transformation theorem for almost splitting maps, generalizing the one obtained by

Cheeger, Jiang and Naber, to possibly collapsed manifolds. We will also introduce some applications of this transformation theorem, one of which is a new smooth fibration theorem. More precisely, we introduce a notion, called the generalized Reifenberg condition, under which we prove a smooth fibration theorem for collapsed manifolds with Ricci curvature lower bound. This gives a unified proof of smooth fibration theorems in many previous works, including the classical ones by Fukaya and Yamaguchi respectively. Some other applications of the transformation theorem will be introduced in this talk. This talk is based on my joint work with Hongzhi Huang.

报告人: 殷浩 (中国科学技术大学) 题目:

题目: 3-circle theorem for Willmore surface

摘要: In this talk, we use the 3-circle argument to provide another proof to the energy quantization of Willmore energy.

报告人: 丁琪 (复旦大学)

题目: Minimal graphs over manifolds

摘要: We will talk about some properties of minimal graphs over manifolds, including Liouville type theorems, Neumann-Poincare inequality, gradient estimates, asymptotic estimates and so on.

报告人: 罗勇 (重庆理工大学)

题目: Liouville type theorems for harmonic functions on Kahler manifolds

摘要: In this report we will give several new Liouville type theorems for harmonic functions on Kahler manifolds. Some of them are based on joint works with Dat Dinh Tien and Dung Nguyen Thac.

报告人: 汪志威 (北京师范大学)

报告人: 陈学长 (南京大学)

报告人: 马世光 (南开大学)

题目: p -Laplace equations and conformal geometry

摘要: Recently, we have found a new type of curvature, which interpolates between scalar curvature and Schouten curvature tensor, whose transformation formula had leading term p -Laplacian operator. Then we can study conformal geometry using p -Laplacian operator and potential theory.

报告人: 孙俊 (武汉大学)

题目: Geometric and Analytic Properties of Pseudoharmonic Maps on Pseudohermitian Manifold

摘要: In this talk, we first give the definition of stationary pseudoharmonic map with defect term on pseudohermitian manifold. Then we prove the monotonicity formula and small energy regularity theorem for stationary pseudoharmonic map with defect term. Under the condition that $\int_T df = 0$, we also derive Liouville theorems for pseudoharmonic and p -pseudoharmonic maps from CR manifold into sphere. This talk is based on the joint work with Dr. Shitong Niu.

报告人: 王险峰 (南开大学)

题目: Uniqueness of self-similar solutions to curvature flows and uniqueness of solutions to isotropic curvature problems

摘要: Self-similar solutions play an important role in the study of the asymptotic behaviors of curvature flows, and are closely related to some prescribed curvature problems. In this talk, we will discuss uniqueness of self-similar solutions to a large family of fully nonlinear curvature flows by high powers of curvature, as well as uniqueness of solutions to some isotropic curvature problems.

报告人: 毕宇晨 (北京大学)

题目: Stability of 2-varifolds with square integrable mean curvatures

摘要: Allard's regularity theorem proves that a n -dimensional integral varifold whose mass ratio is close to 1 in a given ball and has generalized mean curvature in L^p with $p > n$ is in fact a $C^{1, \alpha}$ graph at a slightly small scale. We obtain an extension of Allard (when $p = n = 2$) showing that (when the mass ratio is sufficiently small), the varifold is (at a slightly smaller scale) bi-Lipschitz homeomorphic to a disk. Moreover, for an compact integral 2-varifold with Willmore energy sufficiently close to 16π , we show it is close to the standard embedding of the round sphere in a quantitative way.

报告人: 孙林林 (广西师范大学)

题目: Some results related to the Kazdan-Warner equations

摘要: The Kazdan-Warner equation on surface comes from the prescribed Gaussian curvature problem, and also appears in various contexts such as the abelian Chern-Simons-Higgs models. I shall talk about some results related to the Kazdan-Warner equations on surfaces or finite graphs, including the elliptic method and parabolic approach to the Kazdan-Warner equations on surfaces with sign-changed prescribing function, as well as the topological method to the existence of Kazdan-Warner equations on surfaces or finite graphs.

