

报告题目及摘要

1. 报告人：陈大广（清华大学）

题目：Eigenvalue estimates of the Dirac operator and rigidity of Poincare-Einstein metrics

摘要：In this talk, we will review the eigenvalue estimates of the Dirac operator on spin manifolds with boundary in terms of the first eigenvalues of conformal Laplacian operator as well as the conformal mean curvature operator. Moreover, we will talk about rigidity theorems for any $C^{3,\alpha}$ conformal compactification of some Poincare-Einstein metric on these spin manifolds with boundary. This talk is based on the joint work with Professor Fang Wang and Xiao Zhang.

2. 报告人：陈群（武汉大学）

题目：Harmonic maps and their generalizations

摘要：Harmonic map is an extensively studied geometric variational model. In this talk, we will discuss some results on generalizations of it from considerations in geometry and physics.

3. 报告人：成庆明（日本福冈大学）

题目：2-dimensional complete self-shrinkers

摘要：It is our purpose to study complete self-shrinkers of mean curvature flow in Euclidean spaces. By making use of the generalized maximum principle for L -operator, we study 2-dimensional complete self-shrinkers with constant squared norm of the second fundamental form in \mathbf{R}^3 and \mathbf{R}^4 .

4. 报告人：方牛发（南开大学）

题目：On the geometric theory of functions

摘要：The equivalence of the classical isoperimetric inequality and Sobolev inequality reveals a close relationship between geometry and analysis. In this talk, we attempt to provide a brief description of the geometric theory of functions. The functional isoperimetric inequality, the functional L_p Minkowski inequality, the L_p John ellipsoids for functions and some other important functional inequality that closely relate to convex geometry will be presented. This is the joint work with Wenxue Xu, Jiazuo Zhou and Baocheng Zhu.

5. 报告人：葛建全（北京师范大学）

题目：Quadratic forms on focal submanifolds of isoparametric hypersurfaces in unit spheres

摘要：As is well known, one focal submanifold of isoparametric hypersurface of OT-FKM type is quadratic. We are concerned with the question of Solomon whether the other focal submanifold is quadratic or not. This question would have applications to eigenvalues of isoparametric hypersurfaces by a theorem of Solomon. The question also relates with Hilbert's 17th problem. We will introduce the recent joint work with

Prof. Z. Z. Tang.

6. 报告人: 顾娟如 (浙江工业大学)

题目: The gap theorem for complete hypersurfaces with constant mean curvature in space forms

摘要: In this talk, we will first give a short review of Chern conjecture for minimal hypersurfaces. Motivated by the generalized Chern conjecture for hypersurfaces with constant mean curvature in a sphere, we verify the following gap theorem.

Theorem. Let M be a compact hypersurface with constant mean curvature and constant scalar curvature in the unit sphere S^{n+1} . Denote by H and S the mean curvature and the squared length of the second fundamental form of M respectively. If

$$\alpha(n, H) \leq S \leq \alpha(n, H) + \frac{nH^2}{6(n-1)}, \text{ where } n \geq 4 \text{ and } H \neq 0, \text{ then } S \equiv \alpha(n, H) \text{ and } M \text{ is}$$

the Clifford torus $S^{n-1}(r_1) \times S^1(r_2)$. Here

$$\alpha(n, H) = n + \frac{n^3}{2(n-1)} H^2 - \frac{n(n-2)}{2(n-1)} \sqrt{n^2 H^4 + 4(n-1) H^2}.$$

Furthermore, we generalize the gap theorem to the case of complete hypersurfaces with constant mean curvature and constant scalar curvature in space forms. This is a joint work with L. Lei and H. W. Xu.

7. 报告人: 黄荣里 (广西师范大学)

题目: On the second boundary value problem for Lagrangian mean curvature equation

摘要: We proved the existence of convex solution to Lagrangian mean curvature equation with second boundary condition on uniformly convex domains in \mathbf{R}^n , and then applied it to solve a boundary value problem for Lagrangian graphs with prescribed mean curvature potential in \mathbf{R}^{2n} .

8. 报告人: 蒋仁进 (天津大学)

题目: 关于调和函数和热核的一些进展

摘要: 调和函数与热核在几何分析、PDE 及调和分析等领域的研究中起中重要的作用。当从经典的几何分析发展到度量几何时, 由于先验光滑性的消失, 一些新的工具、方法被发展来处理这些正则性问题。在此过程中, 我们并发现了 Yau 的梯度估计与 Li-Yau 的热核正则性之间的等价关系, 以及它们的 L^p 估计的等价性。进一步, 结合 Riesz 变换的研究, 我们发现了这些梯度正则性在粘合、扰动下的性态(稳定性)。

9. 报告人: 李平 (同济大学)

题目: Kaehler hyperbolic manifolds and Chern number inequalities

摘要: In this talk we will review two well-known conjectures due to Hopf and S.-T. Yau respectively, and explain their connections via the concept of “Kaehler

hyperbolicity” introduced by Gromov. Then we shall report our recent work around Kaehler hyperbolic manifolds.

10. 报告人: 连朝 (西南交通大学)

题目: Prescribed scalar curvatures for homogeneous toric bundles

摘要: In this talk, we will discuss some problems about the existence of metrics of prescribed scalar curvatures for homogeneous toric bundles. This is joint work with B. Chen, Q. Han, A-M. Li and L. Sheng.

11. 报告人: 刘博 (华东师范大学)

题目: Localization formula for eta invariants

摘要: We establish a version of localization formula for equivariant eta-invariants by combining an extension of Goette's result on the comparison of two types of equivariant eta-invariants and a localization formula in differential K-theory for circle-action. An important step of our approach is to construct a pre-lambda-ring structure in differential K-theory. This is a joint work with Professor Xiaonan Ma.

12. 报告人: 刘克峰 (浙江大学/UCLA)

题目: Global methods on variations of complex structures

摘要: We develop certain global geometric methods to study variations of complex structures over Kahler manifolds. More precisely, by using operators from Hodge theory on Kahler manifolds, we obtain closed formulas for holomorphic canonical forms under global variations of complex structures and present several related results including solving general Beltrami equations and solving the Kuranishi obstruction equations in deformation theory of complex structures.

13. 报告人: 刘小博 (北京大学)

题目: Infinite dimensional isoparametric submanifolds

摘要: In this survey talk, I will discuss splitting theorem and homogeneity of isoparametric submanifolds in Hilbert spaces, and their suplications to equifocal submanifolds in symmetric spaces.

14. 报告人: 王鹏 (福建师范大学)

题目: Willmore stability and Morse index of minimal surfaces in spheres

摘要: We aim at the Willmore conjecture in higher co-dimension. Urbano's index Theorem on Clifford torus plays an important role in Marques and Neves's proof of Willmore conjecture in S^3 . We generalize Urbano Theorem to minimal tori in S^4 by showing that a minimal torus in S^4 has index at least 6 and the equality holds if and only if it is the Clifford torus.

It is also natural to ask whether the Clifford torus is Willmore stable when the co-dimension increases and whether there are other Willmore stable tori or not. We answer these problems for minimal tori in S^n , by showing that the Clifford torus in S^3 and the equilateral Bryant-Itoh-Montiel-Ros torus in S^5 are the only Willmore stable minimal tori in arbitrary higher co-dimension. Moreover, the Clifford torus is the only

minimal torus (locally) minimizing the Willmore energy in arbitrary higher co-dimension. And the equilateral (Bryant-Itoh-Montiel-Ros) torus is a (local) constrained-Willmore minimizer, but not a (local) Willmore minimizer.

This is a joint work with Prof. Rob Kusner (UMass Amherst).

15. 报告人：魏国新（华南师范大学）

题目：Complete λ -surfaces in \mathbf{R}^3

摘要：In this talk, we will present a complete classification for 2-dimensional complete λ -surfaces in Euclidean space \mathbf{R}^3 with constant squared norm of the second fundamental form. This talk is based on the joint work with Professor Q.-M. Cheng.

16. 报告人：张振雷（首都师范大学）

题目：Geometric convergence of Kahler-Ricci flow

摘要：In this talk I will survey the results on the Gromov-Hausdorff convergence of Kahler-Ricci flow. I will focus on the case of long-time existence. The results partially confirm Analytic Minimal Model Program.

17. 报告人：周向宇（中国科学院）

题目：Some recent results on multiplier ideal sheaves

摘要：We'll first recall some basics on multiplier ideal sheaves and our recent solution of Demailly's strong openness conjecture, then present some new results.

18. 报告人：朱小华（北京大学）

题目：Classification of steady Ricci solitons with linear curvature decay

摘要：In this talk, we will give a classification of steady Ricci solitons (M^n, g) with nonnegative sectional curvature. Under the condition of linear curvature decay, we show that the universal cover (\tilde{M}, \tilde{g}) of (M, g) should be one of the following:

(i) (\tilde{M}, \tilde{g}) is the euclidean space $(\mathbf{R}^n, g_{\text{Euclid}})$;

(ii) $(\tilde{M}, \tilde{g}) = (\mathbf{R}^2, g_{\text{cigar}}) \times (\mathbf{R}^{n-2}, g_{\text{Euclid}})$;

(iii) $(\tilde{M}, \tilde{g}) = (N^k, g_N) \times (\mathbf{R}^{n-k}, g_{\text{Euclid}})$, $k > 2$. (N, g_N) is a k -dimensional steady Ricci soliton with nonnegative sectional curvature and positive Ricci curvature. Moreover, the scalar curvature R_N of (N^k, g_N) satisfies

$$C_1/r \leq R_N \leq C_2/r.$$

We can also give a further classification in case (iii) when $n = 3, 4$. This is a joint work with Dr. Y. Deng.