

Title and Abstract

Ding, Qi 丁琪 (复旦大学)

Minimal hypersurfaces in manifolds of Ricci curvature bounded below

We will introduce two kinds of limits in differential geometry. One is in the Gromov-Hausdorff sense (intrinsic), and the other is in the varifold sense (extrinsic). Then we talk about the classic theory on stationary varifolds in Euclidean space, and Cheeger-Colding theory on Ricci limit space. At last, we will discuss how to use them to study the possible limits of minimal hypersurfaces in a sequence of $(n+1)$ -dimensional unit balls of $\text{Ric} \geq -n$.

Han, Xiaolong 韩晓龙 (California State University, Northridge)

Quantum ergodicity at small scales

Ergodicity refers to a type of classical dynamical systems with the typical feature of equidistribution of orbits. On a compact manifold with negative sectional curvature, the geodesic flow is ergodic so a typical geodesic orbit is equidistributed. In the corresponding quantum system, the stationary waves are described by the Laplacian eigenfunctions and are also equidistributed. The mathematical theory of such phenomenon is called Quantum Ergodicity. In this talk, I will report on some recent progress on the quantitative scales of the regions on which equidistribution of the orbits in the classical system and the eigenfunctions in the quantum system can be observed.

Hong, Guanghao 洪广浩 (西安交通大学)

Maximal Hypersurfaces over Exterior Domains

Exterior problems for the maximal surface equation are studied. We obtain the precise asymptotic behavior of the exterior solution at infinity. We also prove that the exterior Dirichlet problem is uniquely solvable for admissible boundary data and prescribed asymptotic behavior at infinity. This is a joint work with Professor Yu Yuan.

Liu, Jinsong 刘劲松 (中科院数学与系统科学研究院)

Localization of the Kobayashi metric and applications

Recall that we have the important Caratheodory theorem in 1 dimension. If f maps a Jordan domain D conformally onto the bounded domain in the complex domain, then f has a continuous injective extension to D . In general, this result does not hold in higher dimension. In this talk, we will discuss the local extension problem and give applications.

Shen, Yang 沈洋 (南京大学)

Canonical sections of Hodge bundles

In this talk, we introduce our recent work on the canonical sections of Hodge bundles. First, we review the work of the sections of Hodge bundles for Calabi-Yau manifolds, which uses the method of deformation theory. Then we generalize it to the Calabi-Yau type case, using the method of Hodge theory. Finally, we introduce the applications to characterizing the moduli spaces of certain polarized manifolds as ball quotients. This is a joint work with Professor Kefeng Liu.

Wang, Bing 王兵 (中国科学技术大学)

TBA

Wu, Jiayong 吴加勇 (上海大学)

Geometric inequalities and rigidity of gradient shrinking Ricci solitons

On gradient shrinking Ricci solitons, we show that the Sobolev inequality, the Logarithmic Sobolev inequality, the Schrodinger heat kernel upper bound and the Nash inequality equivalently exist. As applications, we prove that the space of Schrodinger functions with polynomial growth is finite dimensional. We also talk about the eigenvalue of Schrodinger operator and diameter estimates on a compact shrinking Ricci soliton. Finally, we study the rigidity of compact shrinking Ricci solitons. Some results are new even for Einstein manifolds.

Yan, Wenjiao 彦文娇 (北京师范大学)

Recent progress on the Chern conjecture for isoparametric hypersurfaces in spheres

In this talk, we will first recall some background and research history of Chern's conjecture, which asserts that a closed, minimally immersed hypersurface of the unit sphere $S^{n+1}(1)$ with constant scalar curvature is isoparametric. Next, we introduce our progress in this conjecture. We proved that for a closed hypersurface $M^n \subset S^{n+1}(1)$ with constant mean curvature and constant non-negative scalar curvature, if $\text{tr}(A_k)$ are constants ($k = 3, \dots, n-1$) for shape operator A , then M is isoparametric, which generalizes the theorem of de Almeida and Brito in their 1990's paper in 《Duke Math.

J. 》 for $n = 3$ to any dimension n , strongly supporting Chern's conjecture. This talk is based on two joint papers with Professor Dongyi Wei and Professor Zizhou Tang.

Zhang, Huichun 张会春 (中山大学)

Regularity and Liouville property of harmonic maps into CAT(1)-space

CAT(1)-spaces are a class of singular metric spaces with curvature bounded from above 1 in the sense of comparison triangles. In this talk, we will introduce a gradient estimate and a Liouville property for harmonic maps from manifolds into CAT(1)-spaces. This talk is based on a joint work with Xiao Zhong and Xi-Ping Zhu.

Zhang, Yongsheng 张永胜 (同济大学)

On the non-existence of solutions to the Dirichlet problem for minimal surface system

In this talk, we will show how to generalize the non-existence result by Lawson-Osserman.