

Titles and Abstracts

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2011.7.26-29

Jingyi Chen (University of British Columbia)

Title: Recent progress on mean curvature flow for entire Lagrangian graphs

Gui-Hua Gong (University of Puerto Rico, USA)

Title: Non-commutative Geometry, Positive Scalar Curvature, and the Strong Novikov Conjecture.

Abstract: In this talk, I will explain how to use non-commutative geometry to study positive scalar curvature problem of Gromov and Novikov conjecture.

Bo Guan (Ohio State University)

Title: Hypersurfaces of constant curvature in Euclidean and hyperbolic spaces

Jiaxing Hong (Fudan University)

Title: Estimates Near Boundary for Degenerate Elliptic Monge-Ampere Equations

Yi-Zhi Huang (Rutgers University, USA)

Title: Riemannian Manifolds and representations of vertex operator algebras

Abstract: Conjectures by physicists on nonlinear sigma-models are one of the most influential source of inspirations and motivations for many recent works in geometry. Unfortunately nonlinear sigma-models are still not mathematically constructed. I will review some of the attempts to construct such theories and discuss why they do not give the correct theories. I will also propose a program to give such a construction based on my recent work on representations of vertex operator algebras that are not necessarily semisimple.

Jiayu Li (University of Science and Technology of China)

Title: Pinching conditions on symplectic mean curvature flows

Xiaobo Liu (University of Notre Dame, USA)

Title: The genus-1 Virasoro conjecture for Gromov-Witten Invariants.

Abstract: The Virasoro conjecture predicts that the generating function for Gromov-Witten invariants of smooth projective varieties is annihilated by a sequence of differential operators which form a half branch of the Virasoro algebra. This conjecture was proposed by physicists Eguchi, Hori, and Xiong and modified by S. Katz. In case that the target manifold is a point, this conjecture is equivalent to Witten's conjecture, proved by Kontsevich, that the generating function of intersection numbers on the moduli spaces of stable curves is a tau function of the KdV hierarchy. The genus-0 Virasoro conjecture was proved by Tian and myself. Dubrovin and Y. Zhang proved the genus-1 part of this conjecture for manifolds with semisimple quantum cohomology. In this talk, I will explain the current state for the genus-1 Virasoro conjecture for manifolds whose quantum cohomology may not be semisimple.

Peng Lu (University of Oregon, USA)

Title: Some geometric properties of gradient Ricci solitons

Abstract: We discuss first a necessary and sufficient condition for Ricci shrinkers to have positive asymptotic volume ratio, then the lower bounds for the scalar curvatures of noncompact gradient Ricci solitons and a weak Ricci curvature bounds for the solitons, finally the linearized Ricci flow.

Jie Qing (UCSC, USA)

Title: Ricci flow and conformally compact Einstein metrics

Xiaochun Rong (Capital Normal University and Rutgers University)

Title: Injectivity radius estimate of pinched positively curved metrics

Abstract: Let M be a closed manifold. We prove that if M admits a metric g with sectional curvature $0 < \delta \leq \sec_g \leq 1$, then the injectivity radius of g is bounded below by $i(M, \delta) > 0$, a constant depending only on M and δ . This solves a conjecture of Klingenberg-Sakai.

Victor Schroeder (University of Zurich, CH)

Title: Rigidity of Moebius structures

Lorenz Schwachhofer (University Dortmund, Germany)

Title: Hyperbolic monopoles and pluricomplex geometry

Abstract: We investigate the moduli space of hyperbolic monopoles which are instantons with a certain symmetry group. We show that this moduli space has a very special geometric structure: it admits a family of complex structures, parametrized by the 2-sphere, but it is not hypercomplex. This structure sheds some light on the geometry of this space.

Takashi Shioya (Tohoku University, Japan)

Title: Measure concentration and eigenvalues of Laplacian

Abstract: Gromov developed a geometric theory of measure concentra-

tion, which is useful to study the asymptotic behavior of a sequence of Riemannian manifolds with dimensions going to infinity. Although Gromov omitted the details of proofs, we verify some parts of his proofs. Using it, we study the asymptotic behavior of the eigenvalues of the Laplacian if the Riemannian manifolds have nonnegative Ricci curvature.

This is a joint work with Kei Funano (RIMS).

Gang Tian (Princeton University)

Title: Symplectic curvature flow

Hongyu Wang (Yangzhou University)

Title: J-anti invariant cohomology

Yusheng Wang (Beijing Normal University)

Title: On the Cayley-Klein-Hilbert metric;

Abstract: In this talk, we will give a ‘new’ and uniform viewpoint on the Cayley-Klein-Hilbert metric in classical Riemannian geometry. And we will give some applications.

Shicheng Xu (Nanjing University)

Title: Fibrations from Alexandrov spaces to manifolds and their stability

Abstract: It follows from Perelman’s fibration theorem that a map preserving metric balls from an Alexandrov space to a Riemannian manifold is a locally trivial fibration. By Perelman’s stability theorem, such maps are stable under Gromov-Hausdorff convergence if no collapsing occurs. We will talk about these properties for maps which are almost preserving metric balls.

Weiping Zhang (Nankai University)

Title: Geometric quantization on noncompact manifolds

Abstract: We present a joint work with Xiaonna Ma on the geometric quantization on noncompact manifolds. It is a generalization of the Guillemin-Sternberg conjecture to the case of a compact Lie group acting on a noncompact symplectic manifold. It also resolves a conjecture of Vergne.