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Ljudmila Kamenova

Title: Non-hyperbolicity of hyperkahler manifolds and Kobayashi's conjectures

Abstract: The Kobayashi pseudometric  $d_M$  on a complex manifold  $M$  is the maximal pseudometric such that any holomorphic map from the Poincare disk to  $M$  is distance-decreasing. Kobayashi conjectured that this pseudometric vanishes on Calabi-Yau manifolds, and in particular, Calabi-Yau manifolds have "entire curves". Using ergodicity of complex structures, together with S. Lu and M. Verbitsky we prove this conjecture for all K3 surfaces and for many classes of hyperkahler manifolds.

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Chi Li (3)

Title: Yau-Tian-Donaldson conjecture for Fano varieties

Abstract: The Yau-Tian-Donaldson conjecture states that a Fano variety admits a Kahler-Einstein metric if and only if it is K-polystable. This has been proved in cases when the Fano variety is smooth or has mild singularities. We will discuss various techniques for proving such results. These techniques include: algebraic study of K-stability, a-priori estimates for complex Monge-Ampere equations and compactness results from Riemannian geometry.

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“What is ...?": Futaki Invariant.

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Peng Lu

Title: A glimpse into Ricci flow

Abstract: TBA.

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“What is ...?": FIK gradient shrinking Ricci solitons.

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Xiaonan Ma (3)

Title: From index theory to Bergman kernel: a heat kernel approach

Abstract: We explain first the Hirzebruch-Riemann-Roch theorem and introduce the characteristic classes, Chern-Weil theory, then we explain its heat kernel proof: the local index theorem for HRR theorem. We try finally to understand the Bergman kernel from heat kernel inspired by the heat kernel proof of HRR theorem.

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Tristan Riviere

Title: Variational Methods for Minimal Surfaces

Abstract: TBA

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Haotian Wu

Title: Profiling singularities in geometric flows

Abstract: The formation of singularities is a common phenomenon in nonlinear geometric flows such as Ricci flow and mean curvature flow. A fruitful approach to provide precise information about a singularity is the use of matched asymptotics. We survey some results obtained by this approach.

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Chenyang Xu (3)

Title: Introduction to minimal model program

Abstract: I will survey the main ideas in MMP. If time permits, I will discuss some applications in K-stability of Fano varieties.

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"What is ...?": KSBA moduli space.

Abstract: In this introduction talk, I will discuss the recent works by many people on the construction of KSBA moduli space, which is a higher dimensional analogue of the well studied space  $\overline{M}_g$ .

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Zhenlei Zhang

"What is ...?": Gromov-Haudorff stuffs.