Mini-Workshop on Algebraic Surfaces

Time: Mon., Jun.29th, 2026

Venue: SCMS 102, Shanghai Center for Mathematical Sciences

Lecture 1 10:30-11:30

Speaker: Fabrizio Catanese University of Bayreuth

Title: The classification of surfaces of general type with q=p_g=2, and new progress for the case K^2=7

Abstract: I will report on the classification of surfaces of general type with the lowest possible invariant \chi=1,which means q=p_g. Beauville observed that q=p_g implies the upper bound 4, which holds exactly for a product of 2 curves of genus 2, and the case q=p_g=3 was settled some 25 years ago due to work of several authors.Still open is the case q=p_g=2, which was considered by several authors. Here 4 <= K^2 <= 9,and the case K^2=4,5,6 was recently settled by Du, Jiang, Zhang; there are many examples for K^2=8, and the case K^2=9 is suspected not to happen (but the published proofs of this assertion are badly wrong).In the case K^2=7 there are two examples, where the Albanese map has degree 2, respectively 3.I will report on joint work in progress with Matteo Penegini, in the case of degree 3.Theorem. If K^2=7 , d=3, we have only one irreducible family, consisting the CFPP surfaces (some surfaces of the family were discovered by Cancian-Frapporti, and a larger family was constructed by Pignatelli and Polizzi).

Lecture 2 14:00-15:00

Speaker: Wenfei Liu Xiamen University

Title: The minimal volume of stable surfaces with Picard rank 1

Abstract: The set V of volumes of stable surfaces, as a subset of positive rational numbers, satisfies the descending chain condition. Equivalently, any nonempty subset of V attains the minimum. In this talk, I will report a joint work with Jihao Liu, showing that the minimal volume of a stable surface with Picard rank 1 is $\frac{1}{6351}$, uniquely realized by a normal rational stable surface previously constructed from $\square^2$ with 4 lines by Valery Alexeev and Wenfei Liu. In the proof of the minimum, we use various filters to narrow down the possible basket of singularities on such a surface. The last and very crucial one, the so-called pluricanonical filter $P_{a+b} \geq P_a + P_b - 1$, was suggested to us by the AI! We may further apply this filter to rule out additional cases in the classification of small-volume threefolds of general type, and in Kollár's algebraic Montgomery–Yang problem.

Lecture 3 15:30-16:30

Speaker: Xin Lü East China Normal University

Title: Abelian automorphism groups of surfaces of general type

Abstract: Let G be an abelian automorphism group of a surface S of general type. We will report the sharp upper bound on the order of G depending on the first Chern number of S. We also give a characterization on the surfaces reaching the upper bound. This is based on joint works with Z.M. Guo, S.L. Tan and K. Zuo.