Abstracts Workshop

Kenny Ascher

Title: Moduli of low degree K3 surfaces

Abstract: The explicit description of low degree $K3$ surfaces leads to natural compactifications coming from geometric invariant theory (GIT) and Hodge theory. The relationship between these compactifications for degree two $K3$ surfaces was studied by Shah and Looijenga, and revisited by Laza and O'Grady, who also provided a conjectural description for the case of degree four $K3$ surfaces. I will discuss these results, as well as a verification of this conjectural picture using tools from K-moduli. This is joint work with Kristin DeVleming and Yuchen Liu.

Laure Flapan

Title: Kodaira dimension of moduli spaces of hyperkähler manifolds

Abstract: We study the geometry of some moduli spaces of polarized hyperkähler manifolds. We use techniques of Gritsenko-Hulek-Sankaran involving the Borcherds modular form to determine a bound on the degree of the polarization after which these moduli spaces are always of general type. This is joint work with I. Barros, P. Beri, and E. Brakkee.

Christopher Hacon

Title: Recent progress in the Kähler minimal model program

Abstract: The minimal model program is an ambituous program that aims to understand the geometry of complex projective varieties (eg. manifolds defined by polynomial equations). In this talk we will discuss some recent results and challenges encountered trying to extend the minimal model program to the context of Kähler varieties.

Sándor Kovács

Title: KSB stability is automatic in codimension 3

Abstract: In this talk I will first review KSB/A stability, especially their local version and then discuss new results, joint with János Kollár, showing that it is enough to check these conditions, including flatness, up to codimension 2. This implies that we

have a very good understanding of this stability condition in general, because local KSB-stability is trivial at codimension 1 points, and quite well understood at codimension 2 points, since we have a complete classification of 2-dimensional slc singularities.

Yuchen Liu

Title: On K-moduli of quartic threefolds

Abstract: K-stability provides a powerful tool for constructing compact moduli spaces, known as K-moduli spaces, for Fano varieties. However, determining the K-moduli space for specific Fano varieties, such as Fano hypersurfaces, can be a challenging problem. Previously, the K-moduli space for cubic hypersurfaces was shown to be the same as the GIT one up to dimension 4. In this talk, I'll discuss some recent progress on the K-moduli space of quartic threefolds where K-moduli and GIT differ significantly. We find a new codimension 3 locus in the K-moduli space that parametrizes $(2, 2, 4)$ complete intersections in $\mathbf{P}(1^5, 2^2)$. Moreover, we show that this locus is closed by relating the K-stability of such complete intersections to certain del Pezzo surface pairs. This is joint work with Hamid Abban, Ivan Cheltsov, Alexander Kasprzyk, and Andrea Petracci.

Junliang Shen

Title: Cohomology of the moduli of vector bundles and the moduli of Higgs bundles on a Riemann surface

Abstract: The moduli of Higgs bundles on a curve can either be viewed as a variant of the moduli of vector bundle on a curve – a very classical moduli space that has been studied for decades, or the non-abelian Dolbeault cohomology of the curve in view of the non-abelian Hodge theory. In this talk, I will discuss a symmetry of the cohomology of the moduli of Higgs bundles that does not hold for the moduli of vector bundles. I will then explain how different viewpoints lead to completely different proofs of this statement.

Shunsuke Takagi

Title: Behavior of multiplier ideals under pure morphisms

Abstract: Z. Zhuang recently proved that the property of being klt type descends under pure morphisms. In this talk, I will discuss a generalization of his result. Our key tool is the BCM test ideals associated with a canonical BCM algebra constructed by Schoutens. This talk is based on joint work with Tatsuki Yamaguchi.