ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology
Department of Mathematics

Non-commutative abelian surfaces and Kummer type hyperkähler manifolds

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Examples of non-commutative K3 surfaces arise from semiorthogonal decompositions of the bounded derived category of certain Fano varieties. The most interesting cases are those of cubic fourfolds and Gushel-Mukai varieties of even dimension. Using the deep theory of families of stability conditions, locally complete families of hyperkähler manifolds deformation equivalent to Hilbert schemes of points on a K3 surface have been constructed from moduli spaces of stable objects in these non-commutative K3 surfaces. On the other hand, an explicit description of a locally complete family of hyperkähler manifolds deformation equivalent to a generalized Kummer variety is not yet available.

In this talk we will construct families of non-commutative abelian surfaces as equivariant categories of the derived category of K3 surfaces which specialize to Kummer K3 surfaces. Then we will explain how to induce stability conditions on them and produce examples of locally complete families of hyperkähler manifolds of generalized Kummer deformation type. Applications to abelian fourfolds of Weil type will be discussed.

This is joint work in preparation with Arend Bayer, Alex Perry and Laura Pertusi.

Room 4504 (Lift 25/26) Wed, Dec 3, 2025 04:00 PM