

## **GLEN seminar - University of Glasgow, Friday 04 March 2016**

Programme:

13:30      **Thomas Prince** (Imperial)

*Cluster structures from toric degenerations of orbifold del Pezzo surfaces.*

*The collection of toric degenerations of a del Pezzo surface with cyclic quotient singularities has a rich combinatorial structure via the theory of mutations developed by Akhtar-Coates-Galkin-Kasprzyk. We shall define a cluster algebra which governs this combinatorics, and use this to prove a finite type classification for Fano polygons. We then describe the mirror-dual variety in terms of a cluster variety and show that the same variety appears in the work of Gross-Hacking-Keel, as mirror-dual to the complement of an anti-canonical divisor in the original log del Pezzo surface.*

15:00      **Konstanze Rietsch** (King's)

*Polytopes and mirror symmetry for Grassmannians*

*Together with Robert Marsh we wrote down a mirror 'superpotential'  $W_q$  for a general Grassmannian and we showed that studying the critical points of  $W_q$  one can obtain the quantum cohomology ring and integral formulas for descendent genus 0 Gromov-Witten invariants of the Grassmannian. The superpotential is a function defined on a certain cluster variety lying inside another (Langlands dual) Grassmannian.*

*In this talk I will report on joint work with Lauren Williams which gives a different perspective on the same superpotential, and shows up parallels with how superpotentials arise in the setting of toric varieties. In this work we show that the cluster tori lying in the cluster variety are in a natural sense dual to certain tori in the original Grassmannian.*

16:00      **Ziyu Zhang** (Bath)

*Singularities of moduli of sheaves on K3 surfaces and formality*

*We consider the moduli space of  $H$ -semistable sheaves of a not necessarily primitive class on a projective K3 surface  $(X,H)$ . Kaledin and Lehn conjectured that a certain differential graded algebra that controls the deformations of these sheaves is formal, which leads to a complete classification of the singularities of these moduli spaces. I will discuss how one can apply a technique of Kaledin to prove the conjecture in some cases. I will also mention some recent development in this direction by various authors.*

**All talks take place Lecture Theatre C (Room 507), Boyd Orr Building.**