

The Geometry of Topological D-branes, Categories and Applications**Organized by: Sergey Gukov, Anton Kapustin, Ludmil Katzarkov and Yan Soibelman****Lecture Series: June 10 - 12, 2013****• Monday, June 10, 2013****14:00:** Michele Bolognesi*Rational cubic fourfolds containing a plane with nontrivial Clifford invariant*

Abstract: In this talk I will showcase a general class of smooth rational cubic fourfolds X containing a plane whose associated quadric surface bundle does not have a rational section. Equivalently, the Brauer class B of the even Clifford algebra over the discriminant cover (a K3 surface S of degree 2) associated to the quadric bundle, is nontrivial. These fourfolds provide nontrivial examples verifying Kuznetsov's conjecture on the rationality of cubic fourfolds containing a plane. Indeed, using homological projective duality for grassmannians, one obtains another K3 surface S' of degree 14 and a nontrivial twisted derived equivalence $AX = Db(S;B) = Db(S')$, where AX is Kuznetsov's residual category associated to the cubic hypersurface X .

15:15: Matthew Ballard*Windows I*

Abstract: I will discuss the notion of a (grade restriction) window and explain how it allows one to compare derived categories arising in equivariant settings.

• Tuesday, June 11, 2013**14:00:** Ragnar-Olaf Buchweitz*The McKay Correspondence for anti-canonically embedded Fano Varieties II*

Abstract: This is joint work in progress with Lutz Hille. In these talks we apply recent results by Amiot-Iyama-Reiten, Herschend-Iyama-Oppermann, and Minamoto-I.Mori to describe the category of (graded) Maximal Cohen-Macaulay Modules on cones over the anticanonical embedding of a Fano variety with a (leveled) tilting object as a noncommutative version of the classical McKay correspondence for Kleinian singularities. In the first talk I will review the categorical version of the classical McKay correspondence as the trichotomy: Kleinian singularities — Dynkin quivers — preprojective algebras. In the second talk I will explain how these ingredients are generalized and where they (might) apply, including Del Pezzo surfaces and abelian quotient singularities in dimension three.

15:15: Matthew Ballard*Windows II*

- **Wednesday, June 12, 2013**

14:00: Eleonore Faber

Non-commutative desingularizations of non-normal rings

Abstract: This talk is about non-commutative analogs of resolutions of singularities. In particular we study the question of existence of non-commutative desingularizations of non-normal rings. After motivating examples, we will review some recent approaches to non-commutative desingularizations, especially Van den Bergh's non-commutative crepant resolutions. Then we discuss their relevance for non-normal rings. The new results are joint work with H. Dao and C. Ingalls.

15:15: Matthew Ballard

Windows III

All lectures take place in the ESI Boltzmann Lecture Hall