SEMINARIO DI GEOMETRIA

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Politecnico di Torino,
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AULA SEMINARI

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On the smoothness of the Nori-Hlibert Scheme of 2 - Calabi Yau Algebras

Let A be a finitely generated k-algebra over an algebraically closed field of characteristic zero. Let R be a commutative k-algebra. The n-th Nori-Hilbert scheme of A is the scheme whose R-points parameterize cyclic A-module that locally free of rank n as R-module. If A is commutative this is the usual Hilbert scheme of n points on $SpecA$. An algebra is Calabi Yau of dimension d if the d-th shift functor in the derived category of finite dimensional (left) $A-$modules is a Serre functor. We give a sufficient condition for an irreducible component of the Nori - Hilbert scheme of A to be smooth when A is 2 - Calabi Yau.
As an application we prove that all Nori - Hilbert schemes of A are smooth when $A = k[G]$, where G is the fundamental group of a compact aspherical orientable complex surface of genus g and we recover the standard smoothness property of the Hilbert scheme of n-points of an irreducible smooth surface. Joint work with Federica Galluzzi