Titles and Abstracts

Michele Bolognesi (Montpellier)

Rationality questions, derived categories and projective geometry

I will expose some recent results, obtained in collaboration with Auel, Bernardara, Varilly-Alvarado and with Russo about some rationality questions of varieties of dimension 3 and 4. Cubic hypersurfaces of dimension 4 will be an important example, notably cubic fourfolds containing a degree 4 scroll and those containing a plane.

François Charles (Orsay)

Espaces de twisteurs en caractéristique positive

Les espaces de twisteurs sont des espaces de déformation de certaines variétés complexes. Il s'agit d'objets qui vivent hors du monde kählerien. On expliquera comment ils apparaissent dans la géométrie des surfaces K3 sur les corps de caractéristique positive. Notamment, on montrera qu'un argument de Campana sur la non-hyperbolicité des variétés hyperkähleriennes a un analogue dans ce contexte.

Alice Garbagnati (Milan)

Smooth double covers of K3 surfaces

The aim of this talk is to describe the geometry of smooth double covers X of K3 surfaces S. If the branch locus of the double cover consists of rational curves,X is a blow up either of an Abelian surface or of a K3 surface. Here we describe the other cases. In particular we observe that, if there is a curve of genus at least 2 contained in the branch locus, then $h^{2,0}(X) > 1$. So the transcendental part of the middle cohomology of X carries an Hodge structure which is not of K3 type, However, it contains a sub Hodge structure of K3 type which induces the ones of S. In particular if $h^{2,0}(X) = 2$, the Hodge structure of X splits in two sub Hodge structures of K3 type : the one related with S and its orthogonal. In certain specific cases we explicitly and geometrically describe the K3 surface W, which is related with the second sub Hodge structure of K3 type.

Marti Lahoz (Paris 7)

Generalized twisted cubics on a cubic fourfold as a moduli space of stable objects

This is joint work in progress with M. Lehn, E.Macrì and P.Stellari.

We revisit the work of Lehn–Lehn–Sorger–van Straten on twisted cubic curves in a cubic fourfold in terms of moduli spaces of Gieseker stable sheaves. We show that the irreducible holomorphic symplectic eightfold associated to a cubic fourfold not containing a plane and described by the four authors is birational to a moduli space of stable aCM bundles on the cubic fourfold itself. And for a very general such cubic fourfold, we show that the eightfold is isomorphic to a moduli space of tilt-stable objects in the derived category.

Marc Nieper-Wisskirchen (Augsburg)

A Residue Formula for Rozansky-Witten Invariants

The well-known residue formula of Bott allows one to calculate the characteristic number of a compact complex manifold just by looking at the zeroes of a holomorphic vector field with isolated zeroes on the manifold, provided that it possesses such a vector field. The proof of Bott's residue formula has been later restated as a spectral sequence argument for the Koszul complex associated to the vector field by Carrell and Liebermann. Thereby they have enlarged the applicability of the formula vastly. In our talk we will show how the arguments of Carrell and Liebermann can be further generalized and extended to yield a formula for a very general class of integrals in terms of local residue contributions on any compact complex manifold. This class of integrals is big enough to include the so-called Rozansky-Witten invariants of holomorphic symplectic manifolds, giving the first effective method we are aware of to calculate these in general.

Carlos Rito (Porto)

Explicit Schoen surfaces

Chad Schoen (2007) used deformations to construct a family of smooth complex algebraic surfaces S with invariants $\chi = 2, q = 4$ and $K^2 = 16$ with some remarkable properties. Then C. Ciliberto, M. Mendes Lopes and X. Roulleau (2015) showed that the canonical map of S is a double covering of a degree 8 surface $X \subset \mathbb{P}^4$ with 40 double points. In this talk I will explain how to construct the Schoen surfaces explicitely, by computing equations for the surfaces X. There is an interesting connection to the classical Segre cubic and Igusa quartic threefolds. This is work in progress with Xavier Roulleau and Alessandra Sarti.

Fabio Tanturri (Marseille)

Matrix factorizations and curves in $\mathbb{P}^4$

A method to prove the unirationality of a moduli space of curves or of other interesting spaces is to explicitly exhibit a unirational dominating family of projective models. In this talk, I will show how it is possible to construct curves in $\mathbb{P}^4$ by means of matrix factorizations ; by using this technique, we are able to prove the unirationality of the Hurwitz space $H_{8,12}$, as well as other results concerning particular Brill-Noether spaces. This is a joint work with F.-O. Schreyer.

Claire Voisin (Jussieu)

Cubic fourfolds and O'Grady 10-dimensional examples

This is joint work with R. Laza and G. Saccà. We construct a smooth hyper-Kähler compactification of the intermediate Jacobian fibration associated to a general cubic fourfold and show that this is a deformation of the 10-dimensional O'Grady hyper-Kähler manifold. This realizes a project that had been initiated by D. Markushevich.