Workshop Syzygies and moduli of curves
20-21/5/ 2014

Dipartimento di Matematica dell' Università di Milano
Sala di Rappresentanza

20/5

14-14.45 Marian Aprodu, Università di Bucarest

Ulrich bundles on K3 surfaces

Abstract: An Ulrich bundle is an algebraic vector bundle, on a complex n-dimensional projective manifold, that satisfies the same vanishing properties as the trivial bundle on the n-dimensional projective space. The existence of Ulrich bundles reflects well in the associated Chow form, for instance, the equation of a hypersurface with a rank-one, or a rank-two, Ulrich bundle is linearly determinantal, respectively linearly Pfaffian. We prove the existence of Ulrich bundles for K3surfaces with a mild Brill-Noether property. The talk is based on a joint work with Gavril Farkas and Angela Ortega.

15-15.45 Elisa Tenni, Università di Firenze

Families of rational normal scrolls containing binary curves

 Abstract: Binary curves, i.e. nodal curves given by the stable union of two rational curves, may play an interesting role in the computation of the Koszul groups of a smooth canonical curve via degeneration techniques. In particular the close relationship between Koszul groups and rational normal scrolls containing the curve should be easier to understand in the case of binary curves. I will discuss the main properties of certain families of rational normal scrolls containing binary curves, which are relevant for the computation of their Koszul groups. This is joint work with M. Franciosi.

16.15-17 Marco Franciosi, Università di Pisa

Clifford's theorem and Green's conjecture for m-connected curves

Abstract: In this talk I will illustrate some results obtained in collaboration with ElisaTenni. Firstly I will show a generalization to the case of stable curves of the classical Clifford's theorem and of the notion of Clifford's index, pointing out the role played by the notion of m-connectedness. Secondly I will show that Green's conjecture holds for certain class of m-connected stable curve.

21-5

10.15-11 Margherita Lelli-Chiesa, Scuola Normale di Pisa

**Gonality of curves on abelian surfaces and applications
to generalized Kummer varieties**

Abstract: Severi varieties and Brill-Noether theory of curves on K3 surfaces are well understood. Quite little is known for curves lying on abelian surfaces. Given a general abelian surface S with polarization H of type (1,n), we will first prove non-emptiness and regularity of the Severi variety parametrizing d-nodal curves C in the continuous system {H} (that is, in the linear system |H| and in all its translates) for $0<=d<=n-1$. We will then study the gonality of the normalization of C: even in the smooth case, this is not constant when moving C in {H}. The last part of the talk concerns applications to generalized Kummer varieties $K^k(S)$: some extremal rays of the Mori cone of $K^k(S)$ will be constructed and the corresponding birational maps will be geometrically described. This is a joint work in progress with A. L. Knutsen and G. Mongardi.

11.30-12.15 Nicola Pagani, Università di Liverpool

On the extrinsic and intrinsic geometry of moduli of coverings of curves

Abstract: Moduli spaces of covers of curves have been of classical and more recent interests in the field of moduli spaces. One can investigate the geometry of these moduli spaces (for example, their Kodaira dimension and Picard group) or, in a different direction, study the class of those curves in Mg (after having fixed some discrete parameters, like the genus of the covered curve g', and the degree of the cover). Both questions have been thoroughly studied in the case when g' equals 0. In this talk, we discuss the simplest next case: moduli spaces of bielliptic curves. (part of this talk is a joint work with C.Faber).

12.30-13.15 Alessandro Verra, Università di Roma III

On the universal abelian variety over A5 and the slope of A6

Abstract: In the talk the universal family U_g, over the moduli space A_g of complex p.p. abelian varieties of dimension g, is considered. The unirationality of U_5 is proven. The construction is used to study the perfect cone compactification of A_6 and bound its slope. Joint work with G. Farkas.