Geometria Algébrica

Sessão 1

0-20

Orador: Filippo Viviani (Univ. Roma Tre)

TITLE: The cohomology of the Hilbert scheme and of the compactified Jacobians of a singular curve

ABSTRACT: The classical MacDonald formula relates the cohomology of the symmetric product and of the Jacobian of a smooth curve. We will discuss an extension of the formula relating the cohomology of the Hilbert scheme of points and of any fine compactified Jacobian of a reduced curve with locally planar singularities. This is a report on a joint work with L. Migliorini and V. Schende.

20-40

Orador: Carlos Florentino (CAMGSD e FCUL, Univ. de Lisboa)

TITLE: Principal Schottky bundles over Riemann surfaces

ABSTRACT: For a complex reductive group G, and a compact Riemann surface X, we define and characterize the space of Schottky G-bundles over X. These bundles generalize a classical uniformization moduli space when $G=PSL_2$, and have recently reappeared in connection with so-called Lagrangian branes on G-Higgs bundle moduli spaces over surfaces with a real structure. We show that all Schottky G-bundles have trivial topological type, prove a local uniformization theorem for these bundles (being global when X has genus 1), and describe them in a few simpler cases. This is joint work with A. C. Casimiro and S. Ferreira.

45-65

Orador: Helena Soares (ISCTE - IUL)

TITLE: Exceptional bundles of homological dimension k

ABSTRACT: We characterize exceptional vector bundles on projective space of arbitrary homological dimension defined by a linear resolution. Moreover, we determine all Betti numbers of such resolution. This is joint work with Rosa M. Mir\'o Roig.

70-90

Orador: Jorge Neves (CMUC - Univ. Coimbra)

TITLE: On the Castelnuovo-Mumford regularity of a class of binomial ideals

ABSTRACT: We will report on recent and ongoing work with Antonio Macchia, Maria Vaz Pinto and Rafael Villarreal. Our work focuses on the computation of the Castelnuovo-Mumford regularity of certain binomial ideals obtained from graphs. We will describe some partial results and give evidence linking the regularity with important graph invariants.

Sessão 2

0- 20

Orador: Carlos Rito (CMUP - Univ. do Porto e UTAD)

TITLE: A surface with $\chi=1$ and $K^2=8$ not covered by the bidisk

ABSTRACT: Surfaces of general type satisfy the Bogomolov-Miyaoka-Yau inequality $K^2 \leq 3\chi$ where χ is the holomorphic Euler characteristic and K^2 is the self-intersection of the canonical divisor. It is known that the ones attaining the equality are universally covered by the unit ball in in the complex plane and the case $\chi=1$ $K^2=9$ has been completely classified. All known examples of surfaces of general type with $\chi=1$ and $K^2=8$ are covered by the bidisk $H \times H$ where H is the complex upper half-plane. In this talk I will explain the construction of the first example of a surface with such invariants which is not covered by the bidisk. This surface has geometric genus and irregularity $p_g=q=2$.

This is joint work with Francesco Polizzi and Xavier Roulleau.

20-40

Orador: Margarida Melo (CMUC - Univ. Coimbra e Univ. Roma Tre)

TÍTULO: Stacks de Picard universais compatificados sobre curvas marcadas e aplicações

RESUMO: Apresentarei uma família de compatificações do stack de Picard universal sobre o espaço de moduli de curvas estáveis com pontos marcados, dependendo de uma polarização, bem como algumas das suas propriedades. Como consequência, serão indicadas possíveis aplicações desta construção, nomeadamente em questões do tipo enumerativo.

45-65

Orador: André Oliveira (CMUP - Univ. do Porto e UTAD)

TÍTULO: Fixed point subvarieties, nilpotent cone and mixed Hodge polynomials of (parabolic) Higgs bundles

RESUMO: In 2003 Hausel and Thaddeus conjectured a formula for the (stringy) mixed Hodge polynomial of the moduli space of SL(n,C)-Higgs bundles M(SL(n,C)) and of PSL(n,C)-Higgs bundles M(PSL(n,C)) and proved it for n=2,3. They showed that the formula coincides for both groups (which are Langlands dual), for any n. The proof of this equality uses two apparently unrelated subvarieties of M(SL(n,C)): the nilpotent cone N and the subvarieties N' of points which are fixed by an n-torsion point of the Jacobian. We aim to understand the relation between those subvarieties, by looking at the Hitchin fibration. We also apply their strategy to prove a similar statement but in the parabolic setting.

This is work in progress with Peter Gothen and Ana Peón.

70-90

Discussão sobre o futuro da Geometria Algébrica em Portugal