BANDOLEROS 2020
IV Encontro de verão em geometria algébrica

IMECC - UNICAMP

Fevereiro 17-19, 2018

Programação

17 Fevereiro Sala 121 IMECC - UNICAMP

10h00 Marco Pacini (UFF)
On the universal tropical Jacobian

11h00 Charles Almeida (UFMG)
Geometry of moduli spaces of representation of posets

12h00 ALMOÇO

14h00 Giosuè Muratore (UFMG)
Osculating conics and stable maps

15h00 Ethan Cotterill (UFF)
The Strong Maximal Rank Conjecture and higher rank Brill–Noether theory

15h30 COFFE BREAK

16h00 Hugo Galeano Anaya (IMECC)
Classification of codimension one distribution of degree 2 on $\mathbb{P}^3$

18 Fevereiro Sala 121 IMECC - UNICAMP

10h00 Danilo Dias (UFS)
Categoria derivada de funtores e representações de aljavas de feixes coerentes

10h00 Alan Muniz (UFF)
On the moduli space of rank two logarithmic connections over an elliptic curve

12h00 ALMOÇO

14h00 Lia Feital (UFV)
Contagem dimensional para curvas racionais cuspidais via semigrupos

15h00 Amar Henni (UFSC)
Pure instanton sheaves on multiple curves in $\mathbb{P}^3$

15h30 COFFE BREAK

16h00 Brady Ali Medina (IMECC)
Different ways to generalize the Weierstrass Semigroup

19 Fevereiro

Sala 226 IMECC - UNICAMP

9h00 Exame de qualificação de Daniel Futata
Arranjos de retas n-livres

Sala 121 IMECC - UNICAMP

11h00 Gaia Comaschi (IMECC)
Moduli spaces of Pfaffian representations of cubic threefolds

12h00 ALMOÇO

Palestras

On the universal tropical Jacobian
Marco Pacini (UFF)

Abstract: The universal Jacobian over the moduli space of stable curves is a central object in the theory of algebraic curves. The universal Jacobian available so far is the one constructed by Caporaso, which, unfortunately, is not a fine moduli space. In this talk we will construct a tropical analogue of the universal Jacobian, and we will show that the tropical Jacobian is better behaved than the geometric one. We will explain the relationship between the geometric and tropical Jacobian. This is a work in collaboration with Alex Abreu, Sally Andria, and Danny Taboada.

Geometry of moduli spaces of representation of posets
Charles Almeida (UFMG)

Abstract: In this talk we will present the notion of semistability conditions for the moduli space of representation of posets and then introduce the notion of wall system for the stability conditions. Next, we will characterize all possible walls for a given vector dimension. Finally we will discuss the wall crossing phenomena in the stability conditions of the moduli spaces of semistable representations of posets. This is a joint work with Kostiantyn Iusenko (IME-USP).

A Recursive Formula for Osculating Curves
Giosuè Muratore (UFMG)

Abstract: Let X be a smooth complex projective variety. Using a construction due to Gathmann to encode tangency conditions into Gromov–Witten invariants, I present a recursive formula for the number of rational curves in X osculating a very ample hypersurface. This generalizes the classical well known pairs of inflection (asymptotic) lines of Cayley, Salmon, et all, as well as Darbouxs 27 osculating conics.

The Strong Maximal Rank Conjecture and higher rank Brill–Noether theory
Ethan Cotterill (UFF)

Abstract: By viewing a rank two vector bundle as an extension of line bundles we may re-interpret cohomological conditions on the vector bundles (e.g., number of sections) as rank conditions on multiplication maps of sections of line bundles. We apply this philosophy to relate the Brill–Noether theory of rank two vector bundles with canonical determinant to the Strong Maximal Rank Conjecture for quadrics. By verifying that certain "special maximal-rank loci"are nonempty, we are able to produce candidates for rank two linear series of large dimension. We then show that the underlying vector bundles are stable, in order to conclude the existence portion of certain instances of a well-known conjecture due to Bertram, Feinberg and Mukai. This is joint work with Naizhen Zhang (KU Leuven). This is joint work with Adrián Alonso Gonzalo (Universitat Autònoma de Barcelona) and Naizhen Zhang (KU Leuven).

The Classification of codimension one distribution of degree 2 on $\mathbb{P}^3$
Hugo Galeano Anaya (IMECC)

Abstract: We have an almost complete classification of codimension one holomorphic distributions of degree 2 on $\mathbb{P}^3$. In this partial classification, in some cases we use techniques like cohomology, the saturation of a map of sheaves on $T\mathbb{P}^3$ and others. Also we use the concepts of stability to achieve our goals.

Categoria derivada de funtores e representações de aljavas em feixes coerentes
Danilo D. Silva (UFS)

Resumo: Seja $\mathcal{C}$ uma categoria pequena e $\mathcal{A}$ uma categoria arbitrária. Considere a categoria $\mathcal{C}(\mathcal{A})$ cujos objetos são funtores de $\mathcal{C}$ a $\mathcal{A}$ e cujos morfismos são transformações naturais. Seja $\mathcal{B}$ outra categoria, e novamente, considere a categoria $\mathcal{C}(\mathcal{B})$. Agora, dado um funtor $F : \mathcal{A} \to \mathcal{B}$ construímos o funtor induzido $F_{\mathcal{C}} : \mathcal{C}(\mathcal{A}) \to \mathcal{C}(\mathcal{B})$. Assumindo $\mathcal{A}$ e $\mathcal{B}$ categorias abelianas, segue que as categorias $\mathcal{C}(\mathcal{A})$ e $\mathcal{C}(\mathcal{B})$ são tambem abelianas. Temos dois objetivos principais: primeiro, encontrar uma conexão entre a categoria derivada $D(\mathcal{C}(\mathcal{A}))$ e a categoria $\mathcal{C}(D(\mathcal{A}))$; segundo, relacionar os funtores $R(F_{\mathcal{C}})$ e $(RF)_{\mathcal{C}} : \mathcal{C}(D(\mathcal{A})) \to \mathcal{C}(D(\mathcal{B}))$. Aplicamos os resultados obtidos para o caso especial de representações de aljavas em feixes coerentes.

On the moduli space of rank two logarithmic connections over an elliptic curve
Alan Muniz (UFF) Abstract: We will give an explicit description of the (coarse) moduli space of rank two logarithmic connections with fixed spectral data over an elliptic curve. We will show that this moduli space has an open covering whose members are easily described. This is a joint work with Thiago Fassarella yet in progress.

Contagem dimensional para curvas racionais cuspidais via semigrupos
Lia Feital (UFV)

Resumo: Estabelecemos, para curvas de gênero baixo, que a codimensão esperada (n-2)g é alcançada por morfismos cujas imagens possuem no máximo cúspides. Nossa prova usa a estratificação de singularidades de acordo com seu semigrupo de valores. Mostramos também que essa cota falha em geral.

Pure instanton sheaves on multiple curves in $\mathbb{P}^3$
Amar Henni (UFSC)

Abstract: We study some pure sheaves on multiple structures supported on a line in the projective space. These sheaves are related to the fixed locus of the moduli space of mathematical instanton sheaves in $\mathbb{P}^3$, under the natural 3-dimensional torus. Our description is given for multiplicities 1, 2 and 3 as a guide for future generalisation to higher multiplicities.

Different ways to generalize the Weierstrass semigroup
Brady Ali Medina (IMECC)

Abstract: We propose different ways to generalize the concept of a Weierstrass semigroup H_P associated to a point P in a curve X of genus g. We start by defining the Weierstrass set of a vector bundle F with respect to a point P, and we prove that this set is an H_P-ideal. Also, if the vector bundle is semistable, we prove that the largest gap is less than $2g - \mu(F)$, where $\mu(F)$ denotes the slope of F. Furthermore, when F is a line bundle, we define the Weierstrass semigroup of F with respect to a divisor D and we find that the largest gap is less than $2g - \deg(F)/\deg(D)$. Moreover, in the case when $D = P$ we find that the cardinality of the set of gaps is exactly $l(K_X - \deg(F))$, which is a theorem analoguous to the Gap Theorem.

Moduli spaces of Pfaffian representations of cubic threefolds

Gaia Comaschi (IMECC)

Abstract: Given a hypersurface $X \subset \mathbb{P}^n$, we can determine whether its equation might be expressed as the determinant of a matrix of linear forms by showing the existence of certain ACM sheaves on X. In this talk I will treat the case where X is a cubic threefold, illustrating how to prove the existence of sheaves that lead to Pfaffian representations of X. I will then present how to construct the moduli space parameterizing Pfaffian representations of 3-dimensional cubics and explain how it relates to the moduli space of instanton bundles.