Felipe Espreafico Guelerman Ramos
— Curriculum Vitae —

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Presentation and Research Interests

- I am currently a postdoctoral fellow at the Institut de Mathématiques de Jussieu of the Sorbonne University in Paris, under the supervision of Professor Penka Geoergieva.
- Research Interests: Enumerative aspects of Algebraic Geometry, Number Theory and their relations with Physics.
- I have two main research directions. First, I've been working on understanding modularity properties of Gromov–Witten invariants and on more general problems concerning modular forms. Second, I've been working with $\mathbb{A}^1$-enumerative geometry, which concerns solving enumerative problems over any field. I'm interested in understanding how Physical invariants can be realized in this context, but also in more general enumerative problems.
- My other interests include Singularity Theory, Hodge Theory and Symplectic Geometry.

Employment

Postdoctoral Fellow — **Sorbonne University, Paris**
Funded by the European Research Council — *2024–*
Supervision: Penka Georgieva

Education

PhD in Mathematics — **Rio de Janeiro**
Institute of Pure and Applied Mathematics, with a year (2022–2023) spent at University of Heidelberg — *2020–2024*
Supervisors: Hossein Movasati and Johannes Walcher

BSc in Mathematics — **São Carlos**
University of São Paulo, Final Grade 9.6/10 — *2016–2019*
with a semester (2018-2019) spent at Leibniz University Hannover

High School Degree — **Ribeirão Preto**
Foundation Armando Álvares Penteado — *2013–2015*

Research Experience and Grants Awarded

Graduate Level

Refinements of Enumerative Invariants in Physics — **University of Heidelberg**
CAPES PhD Internship Abroad Grant, Heidelberg — *2022–2023*
This grant complemented my PhD fellowship.

Open Gromov-Witten invariants and moduli of enhanced Clalabi-Yau threefolds — **IMPA**
CNPq PhD Fellowship, Rio de Janeiro — *2020–2024*
This grant was a 4-year PhD fellowship.

Undergraduate Level

Intersection Homology and Applications to Singularity Theory — **University of São Paulo**
FAPESP Undergraduate Research Grant, São Carlos — *2019–2019*
Advised by Prof Nivaldo Grulha.

Tjurina Transform and Determinantal Singularities. — **Leibniz Universität Hannover**
FAPESP Research Internship Abroad Grant, Hannover — *2018–2019*
Advised by Prof Anne Frühbis-Krüger.

Introduction to Analytic Geometry — **University of São Paulo**
FAPESP Undergraduate Research Grant, São Carlos — *2017–2018*
Advised by Prof Nivaldo Grulha and Prof Dr Maria Aparecida Soares Ruas.

Transcendental Methods of algebraic/complex geometry in hyperbolic geometry — **University of São Paulo**
FAPESP Undergraduate Research Grant, São Carlos — *2016–2017*
Advised by Prof Alexandre Ananin.

Prizes and Awards

Outstanding Academic Performance as Undergraduate student
University of São Paulo *2019*

Honorable mention
Brazilian Mathematics Olympiad (*undergraduate level*) *2017*

Bronze Medal
Brazilian Chemistry Olympiad (*high school level*) *2015*

Silver Medal
São Paulo's Chemistry Olympiad (*high school level*) *2015*

Bronze Medal
Brazilian Physics Olympiad (*high school level*) *2015*

Teaching and Organizational Experience

Coorganizer of the IMPA Student Seminar **Rio de Janeiro**
Inst. of Pure and Appl. Math. *Aug 2023-Feb 2024*

Teaching Assistant for Riemann Surfaces **Rio de Janeiro**
Inst. of Pure and Appl. Math. *Aug-Dez, 2023*

Teaching Assistant for Differential Topology **Rio de Janeiro**
Inst. of Pure and Appl. Math. *Jan - Mar, 2022*

High School teaching **São Carlos**
Voluntary teacher at a preparatory course for High School Students *2017–2019*

Free course on Category Theory **São Carlos**
Instructor for short course on Category Theory, University of São Paulo *Mar, 2017*

Selected Conferences

Theory of Atoms, Educational Workshop **Sofia**
International Centre for Mathematical Sciences, Speaker *2024*

Motivic homotopy in interaction **Marseille**
Centre International of Mathematical Meetings, Speaker *2024*

Hodge theory, Mirror Symmetry, and Physics of Calabi-Yau Moduli **Heidelberg**
University of Heidelberg, Speaker *2023*

Structures in Enumerative Geometry **Sheffield**
University of Sheffield, Participant *2023*

Géométrie Algébrique en Liberté XXIX **Paris**
Paris-Saclay University, Poster Presenter *2022*

International School on Singularities and Lipschitz Geometry **Cuernavaca**
Autonomous National University of Mexico, Participant *2018*

Lectures and Posters

Modularity of open Gromov-Witten invariants for the quintic threefold **Intern. Centre for Math. Sciences**
Lecture at Theory of Atoms, Educational Workshop, Sofia *2024*

Refinements of Donaldson-Thomas Invariants **Centre Intern. of Math. Meetings**
Lecture at Motivic Homotopy in Interaction, Marseille *2024*

Lines on hypersurfaces beyond real and complex counts **LAGARTOS**
Lecture at the LAGARTOS Seminar, Online *2024*

Arithmetic and motivic refinements of degree zero DT invariants of $\mathbb{A}^3$ **University of Heidelberg**
Lecture at the conference Hodge theory, Mirror Symmetry, and Physics of Calabi-Yau Moduli , Heidelberg *2023*

Atyiah-Bott formula and Refined Enumerative Geometry **Inst. of Pure and Appl. Math.**
Online lecture at the GADEPs Seminar, Rio de Janeiro *2022*

Gauss–Manin Connection in Disguise and Mirror Symmetry **Nottingham University**
Online lecture given at the Online Algebraic Geometry Seminar, Nottingham *2022*

Gauss-Manin Connection in Disguise: How to generalize modular forms **Paris-Saclay University**
Poster at the Geométrie Algébrique en Liberté conference, Paris *2022*

The Fukaya Category and Kontsevich's HMS conjecture **University of Campinas**
Online lecture given at the Masters Level Geometry Seminar by invitation, Campinas *2021*

Bouquet Decomposition for Determinantal Milnor Fibers **University of São Paulo**
Poster at University of São Paulo's International Scientific Initiation Symposium, São Carlos *2019*

Ultrametric Spaces and the Płoski Theorem for plane curves **University of São Paulo**
Talk at 21st Undergraduate Symposium of Mathematics, São Carlos *2018*

Publications and Preprints

1. F. Espreafico, S. McKean and S. Pauli, **Quadratic Segre Indices**, 2025
   - arXiv:2506.01547
2. F. Espreafico and J. Walcher, **On Motivic and Arithmetic Refinements of Donaldson-Thomas Invariants**, 2023
   - arXiv:2307.03655
   - Published at *Communications in Number Theory and Physics vol. 17 no. 1*.
3. F. Espreafico, **Gauss-Manin Connection in Disguise: Open Gromov-Witten Invariants**, 2022
   - arXiv:2205.08302
   - Submitted to *Communications in Mathematical Physics*

Languages

Portuguese: Native
English: Fluent
German: Intermediate
French: Intermediate

References

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