MICHELE GRAFFEO

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RESEARCH INTERESTS

• Algebraic Geometry • Birational Geometry • Resolution of singularities • Hilbert schemes & Moduli spaces of sheaves • Representation theory • Toric Geometry • Enumerative Geometry • Minimal Model Program • Derived Category

ACADEMIC POSITIONS

Postdoctoral Fellow at *SISSA* - Trieste (Italy) 1/2024-present
Project: *"Geometry of Hilbert schemes"*
Mentor: A. T. Ricolfi

Postdoctoral Fellow at *Politecnico di Milano* - Milano (Italy) 2/2023-12/2023
Project: *PRIN 2020 "Squarefree Gröbner degenerations, special varieties and related topics" (MUR, project number 2020355B8Y)*
Mentor: P. Lella

Visiting Fellow at *SISSA* - Trieste (Italy) 1/2023-12/2023
Project: "*Nested Hilbert schemes and GIT stability conditions*"
Mentor: U. Bruzzo

EDUCATION

PhD in Geometry and Mathematical Physics (cum Laude) at *SISSA* - Trieste (Italy) 10/2018-11/2022
Thesis: " *Zero-dimensional sheaves, group actions and blowups* "
Supervisors: U. Bruzzo & A. T. Ricolfi

Master of Science in Mathematics (cum Laude) at *University of Pisa* - Pisa (Italy) 9/2015-9/2018
Thesis: " *Koszul cohomology and Hilbert schemes of points* "
Supervisors: M. Franciosi

Bachelor in Mathematics at *University of Pisa* - Pisa (Italy) 9/2010-5/2015
Thesis: "*Il teorema degli zeri in algebre analitiche reali e complesse* "
Supervisors: F. Acquistapace

Scientific High School diploma at *Liceo Scientifico "Enrico Fermi"* - Sciacca (Italy) 9/2003-8/2008

TO APPEAR AND PUBLISHED

- *"A counterexample to the parity conjecture"*, with F. Giovenzana, L. Giovenzana and P. Lella. To appear in *Algebraic Geometry* 2024
- *"Growth and integrability of some birational maps in dimension three"*, with G. Gubbiotti. *Annales Henri Poincaré*, 13 July 2023 2023
- *"On the Behrend function and the blowup of some fat points"*, with A. T. Ricolfi. *Advances in Mathematics*, Volume 415, 15 February 2023, 108896 2023

PREPRINTS

- *"5d Conformal Matter"*, with M. De Marco, M. Del Zotto, A. Sangiovanni 2023
- *"The geometry of double nested Hilbert schemes of points on curves"*, with P. Lella, S. Monavari, A. T. Ricolfi and A. Sammartano 2023
- *"Moduli spaces of $\mathbb{Z}/k\mathbb{Z}$-constellations over $\mathbb{A}^2$"*. 2022

TEACHING

T.A. for *Mathematical Analysis* at *University of Trieste, School of Engineering* - Trieste (Italy) 9/2023-2/2024
T.A. for *Mathematical Analysis* at *University of Trieste, School of Engineering* - Trieste (Italy) 9/2022-2/2023
T.A. for *Mathematical Analysis* at *University of Trieste, School of Engineering* - Trieste (Italy) 9/2021-2/2022
T.A. for *Mathematical Analysis* at *University of Trieste, School of Engineering* - Trieste (Italy) 9/2020-2/2021
T.A. for *Mathematical Analysis* at *University of Trieste, School of Engineering* - Trieste (Italy) 9/2019-2/2020
T.A. for *Mathematical Analysis* at *University of Pisa, School of Engineering* - Pisa (Italy) 9/2017-2/2018
T.A. for *Linear Algebra* at *University of Pisa, School of Engineering* - Pisa (Italy) 9/2017-2/2018
T.A. for *Linear Algebra* at *University of Pisa, School of Engineering* - Pisa (Italy) 9/2016-2/2017

HELD SEMINARS, POSTER SESSIONS & WRITTEN ESSAYS

- *"Nested variants of the Hilbert scheme of points"* — *University of Milan*
- *"Nested variants of the Hilbert scheme of points on smooth curves"* — *SISSA*
- *"Double nested Hilbert schemes & reverse plane partitions"* — *Politecnico di Milano*
- *"Double nested Hilbert scheme of points on curves"* — *MIMUW*
- *"The geometry of double nested Hilbert schemes"* — *ETH Zürich*
- *"Some open problems and recent progress on the Hilbert schemes of points on smooth threefolds"* — *MPI MiS*
- *"The algebraic entropy and the Reye configuration"* — *TU Chemnitz*
- *"On the number twelve in algebraic geometry"* — *SISSA*
- *"On the dynamics of some birational maps of $\mathbb{P}^3$"* — *Politecnico di Milano*
- *"Behrend number and blowups of planar fat points"* — *Politecnico di Milano*
- *"Dynamics of some birational maps of the projective 3-space"* — *University of Genova*
- *"Dynamics of some birational maps of $\mathbb{P}^3$"* — *SISSA*
- *"GIT stability conditions on the space of G-Constellations"* — *University of Milan*
- *"Minimal resolutions of A_k singularities as moduli spaces of $\mathbb{Z}/(k+1)\mathbb{Z}$-constellations"* — *Federal University of Paraíba*
- Poster session at the Workshop *"Integrable Probability, Classical and Quantum Integrability"* — *SISSA*
- *"Moduli spaces of $\mathbb{Z}/k\mathbb{Z}$-constellations over the affine plane"* — *University of Utrecht*
- *"On the Behrend function and the blowup of some fat points"* — *University of Bologna*
- *"How to get your hands dirty with canonical singularities"* — *SISSA*
- *"Crepant resolutions of symplectic quotient singularities as moduli spaces of constellations"* — *SISSA*
- *"Introduction to K3 surfaces"* — *SISSA*
- *"Moduli of representation of quivers and first examples of scattering diagrams"* — *SISSA/ICTP*
- *"Intersection theory and tautological ring of moduli space of curves"* — *SISSA*
- *"Blowups: some properties and funny examples"* — *SISSA*
- *"Towards the Kodaira vanishing theorem"* — *SISSA*
- *"Playing with quotient singularities"* — *SISSA*
- *"The real nullstellensatz"* — *University of Pisa*
- *"Normalization of complex spaces"* — *University of Pisa*
- Fifty-pages extended essay on *"Markov's Theorem"* based on in-class lectures and individual research

ATTENDED SCHOOLS, WORKSHOPS & ADVANCED COURSES

- *"Genova-Torino-Milano Seminar" University of Milan* — Winter 2024
- *"Enumerative geometry of the Hilbert scheme of points" SRS Research Station (Les Diablerets)* — Winter 2024
- *"A day on Hilbert scheme of points" Humboldt University (Berlin)* — Fall 2023
- *"Geometry In Bicocca" Università di Milano-Bicocca* — Summer 2023
- *"A workshop on Geometry and Commutative algebra" Politecnico di Milano* — Summer 2023
- *"Genova-Torino-Milano Seminar" Università degli studi di Genova* — Spring 2023
- *"Hilbert schemes, moduli spaces, and symplectic varieties" Université de Nantes* — Spring 2023
- *"Commutative Algebra TOwards Applications" (Torino)* — Spring 2023
- *"Mini-school: Real and complex birational geometry" at University of Milan (Milano)* — Spring 2023
- *"Refined invariants in Moduli Theory" (Trieste)* — Spring 2023
- *"5th Christmas Workshop on Moduli Spaces and Integrable Systems" (Genova)* — Winter 2022
- *"AGATES-Deformation theory workshop" at IMPAN (Warsaw)* — Winter 2022
- *"Young Researchers Meeting in Algebra and Geometry 2022" conference at SISSA (Trieste)* — Fall 2022
- *"Recent Advances in Classical Algebraic Geometry" conference at Jagiellonian University (Krakow)* — Summer 2022
- *"Mini-workshop on Quiver Varieties and Related Topics" workshop at University of Oxford* — Summer 2022
- *"New Perspectives on Hyperkähler Manifolds" workshop at Levico Terme* — Spring 2022
- *"Moduli Spaces and Stability Conditions" school & workshop at Levico Terme* — Spring 2022
- *"Derived Functors" PhD course by U. Bruzzo* — Fall 2020
- *"Hilbert schemes, Mckay correspondence and singularities" winter school at Univ. Paris Diderot (Paris)* — Winter 2019
- *"Localisation in Enumerative Geometry" PhD course by A. T. Ricolfi* — Fall 2019
- *"Differentiable Orbifolds" PhD course by B. Fantechi* — Fall 2019
- *"Foliations in algebraic geometry" summer school at Istitut Fourier (Grenoble)* — Summer 2019
- *"Gauge Theory" PhD course by A. Tikhomirov* — Spring 2019
- *"Advanced topics in algebraic geometry" PhD course by E. Arbarello* — Fall 2018
- *"Algebraic surfaces: the cubic surface, the Cayley cubic, lines on smooth surfaces" PhD course by F. Catanese* — Fall 2018
- *"Cones of divisors and positivity" PhD course by L. Lombardi* — Fall 2018
- *"Integrable systems from moduli spaces of stable curves" PhD course by P. Rossi* — Fall 2018

PRIZES

- Lutman Prize for the best PhD thesis in Mathematics, 2023.

LANGUAGES & IT SKILLS

- Italian: native; English: fluent; French: basic.
- Macaulay2, GAP, Latex, Unity, Windows OS, Android OS (Developer), Microsoft application, Office suite (ECDL) (Advanced), Ubuntu, C programming language, html.

REFEREES

Ugo Bruzzo
SISSA
bruzzo@sissa.it

Andrea Tobia Ricolfi
SISSA
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ORGANISATION OF EVENTS & OTHER TASKS

- Co-organiser of the Algebraic Geometry seminar in SISSA 2021-22
- Co-organiser of the Algebraic Geometry seminar in SISSA/IGAP 2020-21
- Co-organiser of the Algebraic Geometry seminar joint between SISSA and ICTP 2019-20
- Co-organiser of the Algebraic Geometry seminar in SISSA 2018-19
- Museum guide of a Mathematics exhibition named *"Mathematics in ancient Greece"* Pisa (Italy) 2018
- Developed strong analytical, problem-solving and time management skills, throughout my PhD studies at SISSA.
- Proven excellent communication, coaching and leadership skills, when working as a teaching assistant.
- Learnt how to be a team-player and how to get the best from joint outcome when working in a group.
- Learnt how to work and deliver results in high-pressure situations, such as studying and working at the same time.
- Volunteer work with both the needy and the elderly.
- Interests and hobbies: music, politics and chess.