
Academic Positions

- 09/2025- **Associate Professor in Geometry (MATH02-B)**, Università di Modena e Reggio Emilia
09/2022- **Tenure track Assistant Professor (RtdB)**, Università di Modena e Reggio Emilia
08/2025
2020 - 2022 **Postdoctoral Fellow**, Università di Trento, 24 months
2018 - 2020 **Postdoctoral Fellow**, Univerisité de Genève, 24 months

Education

- 2018 **PhD in Mathematics**, Università di Bologna, Supervisor: Professor Luca Migliorini
Thesis title: "Two applications of the decomposition theorem to moduli spaces"
2014 **MSc in Pure Mathematics**, Università di Bologna
Final mark: 110/110 cum laude
2012 **BSc in Pure Mathematics**, Università di Bologna
Final mark: 110/110 cum laude

Research Interests

Support theorem and perverse sheaves.

Non abelian Hodge theory. Study of the $P=W$ conjecture and its compact analogues on IHS varieties

Irreducible holomorphic symplectic (IHS) varieties. Study of their cohomological properties and their Hodge theory.

Complex algebraic geometry

Publications

Published Articles

- 11) **$P=W$ phenomena in algebraic and enumerative geometry**, *Bollettino UMI*, 18 (2025), pp.457-487
DOI:10.1007/s40574-024-00420-z
- 10) **O'Grady tenfolds as moduli spaces of sheaves**, with Franco Giovenzana and Annalisa Grossi , *Forum of Mathematics, Sigma*, 12 (2024) e60
DOI:10.1017/fms.2024.46
- 9) **On generalized nefness and bigness in adjunction theory**, with Claudio Fontanari, *Vietnam Journal of Mathematics*, 52 (1) (2023), pp. 255 - 263
DOI: 10.1007/s10013-022-00604-0
- 8) **$P=W$ conjectures for character varieties with symplectic resolution**, with Mirko Mauri, *Journal de l'École polytechnique-Mathématiques* 9 (2022), pp.853-905
DOI: 10.5802/jep.196
- 7) **On intersection cohomology and Lagrangian fibrations for irreducible symplectic varieties**, with Junliang Shen and Qizheng Yin, *Trans. Amer. Math. Soc.* (2022), pp. 1-15
DOI: 10.1090/tran/8592

- 6) **Betti Numbers of Brill-Noether varieties on a general curve**, with Claudio Fontanari, *Atti Accad. Naz. Lincei Rend. Lincei Mat. Appl.* (2021), pp.1-9
DOI: 10.4171/RLM/964
- 5) **On the splitting principle of Beniamino Segre**, with Claudio Fontanari, *Ann. Mat. Pura Appl.* (2021), pp. 1-6
DOI: 10.1007/s10231-021-01171-w
- 4) **Intersection cohomology of the moduli space of Higgs bundles on a curve of genus 2**, *Journal of the Institute of Mathematics of Jussieu*, (2021) pp. 1-50
DOI: 10.1017/S1474748021000347
- 3) **A support theorem for nested Hilbert schemes of planar curves**, *Manuscripta Math.*, 164 (2021), pp. 467–488
DOI: 10.1007/s00229-020-01189-z
- 2) **Intersection cohomology of the moduli space of Higgs bundles on a genus 2 curve**, *Oberwolfach Reports* Volume 16, Issue 2, (2019), pp. 1357–1417
DOI: 10.4171/OWR
- 1) **Two applications of the decomposition theorem to moduli spaces**, PhD Thesis, Bologna, 2018
DOI: 10.6092/unibo/amsdottorato/8681

Preprints

- 12) **Symmetric weights in finite element exterior calculus**, with Ludovico Bruni Bruno and Enrico Zampa, submitted
- (13) **Parabolic bundles and the intersection cohomology of moduli spaces of vector bundles on curves**, with Andras Szenes and Olga Trapeznikova, submitted
arXiv:2502.20327
- (14) **Intersection theory on singular moduli spaces of vector bundles: a parabolic approach**, with Olga Trapeznikova, submitted
arXiv:2603.01946

(Long) Research stays

- 05/2021 **Visiting Researcher**, *Université de Genève*, Genève, 2 weeks
 02/2020 **Visiting Researcher**, *Max Planck Institute for Mathematics*, Bonn, 2 weeks
 10/2016 **Visiting Researcher**, *Imperial College*, London, 2 weeks

Membership in Research groups, Grants and Projects

- 2025 Member of the project FAR 2025 "Discrete Methods in Combinatorial Geometry and Geometric Topology"
 2024 Member of the project FAR 2024 "Discrete Methods in Combinatorial Geometry and Geometric Topology"
 2023 Member of the project FAR 2023 "Discrete Methods in Combinatorial Geometry and Geometric Topology"
 2020-2022 Member of the project PRIN 2017 "Advances in moduli theory and birational Classification"
 2018-2020 Member of the SNF projects 17599 and 156645
 2018-2020 Member of SWISSMAP
 2014- Member of INdAM GNSAGA

Honours, Awards and Studentships

- 2014 3years PhD Fellowship, University of Bologna
 2012 Collegio Superiore Fellowship (award of excellence for outstanding students during the MSc)
 2009 INDAM prize for students in Mathematics

2009 MIUR (Ministry of Public Instruction and Research) Award of Excellence for Scientific High School degree

Given and upcoming talks

As invited speaker at conferences

- 2025 *Current developments in moduli theory*, ICTP Trieste
- 2025 *GQT colloquium 2025*, De Poort
- 2025 *Helvetic Algebraic Geometry conference*, Les Diablerets
- 2025 *Hodge Theory and Algebraic Geometry*, Stonybrook
- 2025 *Enumerative geometry, representation theory, and physics*, IPMU Tokyo
- 2024 *The $P=W$ Conjecture in Non Abelian Hodge Theory*, Oxford
- 2023 *Vector bundles and combinatorial algebraic geometry*, Frankfurt
- 2023 *Young researchers in Algebra and Geometry*, Roma
- 2023 *Categorified enumerative invariants*, Lausanne
- 2023 *VBAC*, Essen
- 2023 *Refined invariants in moduli theory*, Trieste
- 2022 *DMV annual meeting*, Berlin
- 2022 *Gauged Maps, Vortices and Their Moduli*, Les Diablerets
- 2022 *Geometric Structures Re-United*, Chicago
- 2021 *Seminari di Natale*, Milano
- 2021 *VBAC conference*, online
- 2021 *Giornate di Geometria Algebrica e argomenti correlati XV*, online
- 2020 *DMV annual meeting*, online
- 2020 *ISAAC 2019*, Aveiro
- 2020 *Geometry and Physics of Higgs Bundles*, Oberwolfach
- 2019 *Workshop on Fano varieties and IHS manifolds*, Rimini
- 2018 *Current trends and spectral data for Higgs bundles*, Oxford
- 2018 *JAVA*, Tatihou
- 2017 *Higgs bundles and Hitchin systems*, Chicago

Invited talks

- 2024 *Algebra and Geometry seminar*, Politecnico di Milano
- 2023 *Algebra and Geometry seminar*, University of Bologna
- 2023 *TRINO seminar*, University of Trieste
- 2022 *EDGE seminar*, University of Edinburgh
- 2022 *Geometry Seminar*, Göethe Universität Frankfurt
- 2022 *Geometry Seminar*, University of Torino
- 2022 *Geometry Seminar*, Center for Quantum Mathematics
- 2022 *Geometry Seminar*, Universidad Complutense de Madrid,online
- 2021 *Algebra and Geometry Seminar*, University of Pisa
- 2021 *Geometry Seminar*, TU Chemnitz, online
- 2021 *Geometry Seminar*, IST Lisboa, online
- 2021 *Geometry Seminar*, UC Riverside, online
- 2020 *Algebraic Geometry Seminar*, EPFL, online
- 2020 *Algebraic geometry seminar*, University of Strasbourg
- 2020 *Algebraic Geometry seminar*, University of Trento
- 2020 *Algebraic geometry seminar*, Max Planck Institute for Mathematics
- 2019 *MAGIC seminar*, Imperial College London
- 2017 *Geometry seminar*, University of Heidelberg

Service

Referee for Journal of the European Mathematical Society, Compositio Mathematica, Journal of Algebraic Geometry, Advances in Mathematics, Journal of the Institute of Mathematics of Jussieu, Quarterly Journal of Mathematics, Proceedings of the Cambridge Philosophical Society, Advances in Geometry, Journal of the London Mathematical Society

- 2026 Member of the committee for admission to the PhD program of SISSA
- 2024 Member of the committee for assigning a research position at University of Bologna, PI Giovanni Mongardi
- 2024 Member of the committee for admission to the Master Degree of SISSA

Seminar and Conferences Organized

- 2025 **Organizer of CIRM school *Tropical insights in algebraic geometry and moduli theory***, with Claudio Fontanari, Trento
- 2025 **Organizer of *Ricercatori in Algebra e Geometria 2025***, with Francesca Carocci, Modena
- 2020-2022 **Organizer of *Geometry Seminar at Unitn***, together with Elisa Postinghel and Luis Solá Conde, University of Trento
- 2018/2019 **Organizer of *Fable Géométriques***, together with Grigory Mikhalkin, University of Geneva
- 2018-2020 **Organizer of *Séminaire de la Tortue***, together with Andras Szenes, University of Geneva
- 2017 **Organizer of the conference *Workshop on IHS manifolds and stability conditions***, together with Giovanni Mongardi and Annalisa Grossi
- 2014-2018 **Organizer of *Ba.D. mood seminar***
- 2014 **Organizer of the conference *Perspectives in physical mathematics***, together with Marco Trozzo and Lorenzo Ruffoni, Bologna

Teaching experience

- 2025/2026 "Geometria" for Mechanical Engineering, University of Modena and Reggio Emlilia. 54 hours
- 2025/2026 "Geometria superiore" for Master Degree in Mathematics, University of Modena and Reggio Emlilia. 42 hours
- 2025/2026 "Geometria" for Physics, University of Modena and Reggio Emlilia. 48 hours
- 2024/2025 "Geometria e algebra lineare" for Informatics Engineering, University of Modena and Reggio Emlilia. 48 hours
- 2024/2025 "Geometria" for Physics, University of Modena and Reggio Emlilia. 48 hours
- 2023/2024 "Geometria e algebra lineare" for Informatics Engineering, University of Modena and Reggio Emlilia. 48 hours
- 2023/2024 "Geometria" for Physics, University of Modena and Reggio Emlilia. 48 hours
- 2022/2023 "Geometria e algebra lineare" for Informatics Engineering, University of Modena and Reggio Emlilia. 48 hours
- 2022/2023 "Geometria" for Civil Engineering, University of Modena and Reggio Emlilia. 24 Hours
- 2020/2021 Instructor for the module "Matematica e Statistica 1" at University of Trento. 24 hours
- 2020/2021 Teaching Assistant for the module "Geometria A" at University of Trento. 48 hours
- 2019/2020 Teaching Assistant for the module "Géométrie différentielle" at University of Geneva. 30 hours
- 2019/2020 Teaching Assistant for the module "Algèbre I" at University of Geneva. 30 hours
- 2019/2020 Teaching Assistant for the module "Analyse réelle II" at University of Geneva. 10 hours
- 2018/2019 Teaching Assistant for the module "Basic geometrical notions in Mechanics" at University of Geneva. 40 hours

- 2018/2019 Teaching Assistant for the module "Géométrie II" at University of Geneva. 30 hours
- 2017/18 Teaching Assistant for the module "Geometria 1 " at University of Bologna. 60 hours
- 2016/17 Teaching Assistant for the module "Geometria 1 " at University of Bologna. 60 hours
- 2015/16 Teaching Assistant for the module "Geometria e algebra" at University of Bologna. 50 hours
- 2014/15 Teaching Assistant for the module "Geometria e algebra" at University of Bologna. 50 hours

Graduate Teaching

- 2026 Ph.D. course "Hodge Theory" at University of Modena and Reggio Emilia. 20 hours
- 2024 Ph.D. course "Hodge Theory" at University of Modena and Reggio Emilia. 20 hours
- 2023 Ph.D. course "The P=W conjecture" at University of Essen. 5 hours
- 2022 Ph.D. course "Non abelian Hodge correspondence and P=W conjecture" at University of Illinois at Chicago. 5 hours
- 2022 Ph.D. course "Intersection cohomology and perverse sheaves" at University of Trento. 30 Hours

Languages

- Italian Native
- English Proficient
- French Intermediate

Computer skills

- Advanced Computer algebra software as Mathematica, Macauley2, Matlab
- Miscellaneous LaTeX, C++ Windows, Office

Modena, 30/12/2025