

Francesco Sala

Curriculum Vitae

Dipartimento di Matematica, Università di Pisa
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Current Position

- Dec. 31, 2022 – **Associate Professor**, *Università di Pisa*, Italy.
Present
- Jan. 1, 2023 – **Visiting Scientist**, *Kavli IPMU, University of Tokyo*, Japan.
Present

Employments

- 2020–2022 **Visiting Associate Scientist**, *Kavli IPMU, University of Tokyo*, Japan.
2019–2022 **Assistant Professor (RTDb)**, *Università di Pisa*, Italy.
2016–2019 **Postdoctoral Fellow**, *Kavli IPMU, University of Tokyo*, Japan.
2014–2016 **Postdoctoral Fellow**, *University of Western Ontario*, London, Canada.
2012–2014 **Postdoctoral Research Associate**, *Heriot-Watt University*, Edinburgh, UK.

Education

- 2011 **Ph.D. in Geometry and Doctorat en Mathématiques Pures (co-tutorial thesis)**, *SISSA, Trieste, Italy* and *Université Lille 1, France*.
Advisors: U. Bruzzo and D. Markushevich
- 2008 **Master's Degree in Mathematics**
(in collaboration with *SISSA*), *Università degli Studi di Trieste, Italy*, 110/110 cum laude.
- 2008 **Diploma "Percorso Formativo Comune"**, *SISSA, Trieste, Italy*.
- 2006 **Bachelor's Degree in Mathematics**, *Università degli Studi di Palermo, Italy*, 110/110 cum laude.

Academic Qualification

- 2023 – 2034 **"Abilitazione Scientifica Nazionale"**.
Qualified for the "Abilitazione Scientifica Nazionale a Professore di Prima Fascia - Settore concorsuale 01/A2 Geometria e Algebra" to work as a Full Professor in Geometry and Algebra at an Italian University

Grants and Fellowships

- 2023–2024 **MIT - Italy Università di Pisa Seed Fund (PI) "Quantum Structures and Enumerative Geometry"**, with A. Maffei (*Università di Pisa*), D. Maulik (*MIT*), and A. Neguț (*MIT*), € 20,000.
- 2021–2026 **Grant-in-Aid for Scientific Research C (PI, no. 21K03197) "Yangians and Cohomological Hall algebras of curves"**, *Japanese Society for the Promotion of Science (JSPS)*, Japan, ¥ 4,290,000 (~ € 27,000).
- 2020–2022 **Progetto di Ricerca di Ateneo (no. PRA_2020_40) "Spazi di moduli, geometria aritmetica e aspetti storici"**, with A. Bandini, A. Cogliati, V. Melani, T. Szamuely, M. Talpo, *Università di Pisa, Italy*, € 31,625.
- 2018–2020 **Grant-in-Aid for Young Scientists (PI, no. JP18K13402) "Cohomological Hall algebra of a curve"**, *Japanese Society for the Promotion of Science (JSPS)*, Japan, ¥ 2,860,000 (~ € 18,000).
- 2017–2019 **Grant-in-Aid for Research Activity Start-up (PI, no. JP17H06598) "Hall algebras and gauge theory on a surface"**, *Japanese Society for the Promotion of Science (JSPS)*, Japan, ¥ 1,300,000 (~ € 8,000).
- 2015–2024 **Conference Grants**, *Foundation Compositio Mathematica*.
List of supported conferences and workshops:

- Quantization in Representation Theory, Derived Algebraic Geometry, and Gauge Theory. 2024
- New Perspectives on Hyperkähler Manifolds. A Celebration of Dimitri Markushevich's 60 Birthday. 2022
- IHÉS Summer School on Enumerative Geometry, Physics and Representation Theory. 2021
- CIME School on Geometric Representation Theory and Gauge Theory. 2018
- Workshop on Hall algebras, enumerative invariants and gauge theories. 2016
- Workshop on Moduli spaces in Algebraic Geometry and Mathematical Physics. 2015

2014–2024 **Conference Grants.**

Funded by: SwissMap Research Station, Switzerland (2024), CIRM Trento, Italy (2022); IHÉS, France (2021); Fields Institute, Toronto, Canada (2016); Chern Institute of Mathematics, Tianjin, China (2015); Lorentz Center, Leiden, The Netherlands (2014).

2019 **Program Participant Support**, *Simons Center for Geometry and Physics*, Stony Brook, USA.

2016 **IHP Trimester Participant Support**, *Institut Henri Poincaré*, Paris, France.

2014 **IHP Research in Pairs Fellowship**, *Institut Henri Poincaré*, Paris, France.
(with M. Pedrini)

2012–2014 **Postdoctoral Research Associate Fellowship**, *The Leverhulme Trust*, UK.

2008–2011 **Ph.D. Student Fellowship**, *SISSA*, Trieste, Italy.

2006–2008 **Master's degree Student Fellowship "Percorso Formativo Comune"**, *SISSA*, Trieste, Italy.

Publications

Refereed Articles in Journals

- [19] **Shuffle algebras for quivers as quantum groups**, with A. Neguț and O. Schiffmann, *to appear in Mathematische Annalen*.
[arXiv link]
- [18] **McKay correspondence, cohomological Hall algebras and categorification**, with D.-E. Diaconescu and M. Porta, *Representation Theory of The American Mathematical Society*, 2023, 27, 933-972.
[Journal link], [arXiv link]
- [17] **Two-dimensional categorified Hall algebras**, with M. Porta, *Journal of the European Mathematical Society*, 2023, 25, no. 3, 1113-1205.
[Journal link], [arXiv link]
- [16] **Continuum Kac–Moody Lie algebras**, with A. Appel and O. Schiffmann, *Moscow Mathematical Journal*, 2022, 22, no. 2, 177-224.
[Journal link], [arXiv link]
- [15] **Fock space representation of the circle quantum group**, with O. Schiffmann, *International Mathematics Research Notices IMRN*, 2021, no. 22, 17025-17070.
[Journal link], [arXiv link]
- [14] **Quantization of continuum Kac–Moody Lie algebra**, with A. Appel, *Pure and Applied Mathematics Quarterly*, 2020, 16, no. 3, 439-493.
[Journal link], [arXiv link]
- [13] **Cohomological Hall algebra of Higgs sheaves on a curve**, with O. Schiffmann, *Algebraic Geometry*, 2020, 7, no. 3, 346-376.
[Journal link], [arXiv link]
- [12] **The circle quantum group and the infinite root stack of a curve**, with O. Schiffmann and with an appendix by T. Kuwagaki, *Selecta Mathematica, New Series*, 2019, no. 5, Art. 77, 86 pp.
[Journal link], [arXiv link]
- [11] **Instantons and framed sheaves on Kähler Deligne–Mumford stacks**, with P. Eyssidieux, *Annales de la Faculté des Sciences de Toulouse. Mathématiques. Série 6*, 2018, 27, no. 3, 599-628.
[Journal link], [arXiv link]
- [10] **AGT relations for abelian quiver gauge theories on ALE spaces**, with M. Pedrini and R. J. Szabo, *Journal of Geometry and Physics*, 2016, 103, 43-89.
[Journal link], [arXiv link]
- [9] **Framed sheaves on root stacks and supersymmetric gauge theories on ALE spaces**, with U. Bruzzo, M. Pedrini, and R. J. Szabo, *Advances in Mathematics*, 2016, 288, 1175-1308.
[Journal link], [arXiv link]

- [8] $\mathcal{N} = 2$ **quiver gauge theories on A-type ALE spaces**, with U. Bruzzo and R. J. Szabo, *Letters in Mathematical Physics*, 2015, 105, no. 3, 401-445.
[Journal link], [arXiv link]
- [7] **Framed sheaves on projective stacks**, with U. Bruzzo and with an appendix by M. Pedrini, *Advances in Mathematics*, 2015, 272, 20-95.
[Journal link], [arXiv link]
- [6] **Restriction theorems for μ -(semi)stable framed sheaves**, *Journal of Pure and Applied Algebra*, 2013, 217, no. 12, 2320-2344.
[Journal link], [arXiv link]
- [5] **Symplectic structures on moduli spaces of framed sheaves on surfaces**, *Central European Journal of Mathematics*, 2012, 10, no. 4, 1455-1471.
[Journal link], [arXiv link]

Proceedings

- [4] **Representations of cohomological Hall algebras via stable pairs**, with D.-E. Diaconescu and M. Porta. In "Interactions between Algebraic Geometry and Noncommutative Algebra", *Oberwolfach Reports*, 2022, 19, no. 2, 1239-1312.
[Journal link]

Ph.D. Thesis

- [3] **Some topics in the geometry of framed sheaves and their moduli spaces**, *SISSA, Trieste, and Université Lille 1, 2011*, 1–103.
[Ph.D. Thesis link]

Submitted Papers and Preprints

- [2] **Flops and Hilbert schemes of space curve singularities**, with D.-E. Diaconescu, M. Porta, and A. Vosoughinia, 2023.
[arXiv link]
- [1] **Cohomological Hall algebras and their representations via torsion pairs**, with D.-E. Diaconescu and M. Porta, 2022.
[arXiv link]
- [0] **Representations of the Heisenberg algebra and moduli spaces of framed sheaves**, with P. Tortella.
[arXiv link]

Book

Simpson's shapes of schemes and stacks, with M. Porta, *in preparation*.
[link to the draft] (updated on September 30, 2020)

Editorial Work

- 2019 Editor (with U. Bruzzo and A. Grassi). "Geometric Representation Theory and Gauge Theory". Cetraro, Italy 2018. Lecture Notes in Mathematics. Fondazione CIME/CIME Foundation Subseries. Springer, 2019
- 2017 Special Issue Managing Editor. "Interactions between Geometry and Physics. A topical issue in honor of Ugo Bruzzo's 60th birthday", *Journal of Geometry and Physics*, 2017, 118, 1–234
- 2016 Guest Editor (with U. Bruzzo). Special issue on "Instanton Counting: Moduli Spaces, Representation Theory and Integrable Systems", *Journal of Geometry and Physics*, 2016, 109, 1–122

Selected Visiting Positions

- 2024, 2017 **MIT, USA**.
(2 weeks, 2 weeks)
- 2024, 2023 **Kavli IPMU, the University of Tokyo, Japan**.
(5 weeks, 5 weeks)
- 2023 **ICMAT, Madrid, Spain**.
(5 weeks)

- 2023, 2017, **SISSA**, Trieste, Italy.
 2016, 2012 (3 weeks, 6 weeks, 4 weeks, 9 weeks)
- 2022, 2021 **MFO**, Oberwolfach, Germany.
 Research in Pairs Program (2 weeks, 2 weeks)
- 2022, 2021, **Université de Strasbourg**, France.
 2018 (2 weeks, 2 weeks, 2 weeks)
- 2021, 2016, **IHÉS**, France.
 2014, 2011 (8 weeks, 8 weeks, 6 weeks, 10 weeks)
- 2019 **SCGP**, Stony Brook, USA.
 Program “Geometry and Physics of Hitchin Systems” (2 weeks)
- 2018, 2017, **Université de Paris-Saclay**, Paris, France.
 2015 (2 weeks, 5 weeks, 5 weeks)
- 2016 **Institut Henri Poincaré**, Paris, France.
 Thematic trimester devoted to “Program on the mathematics of string theory” (8 weeks)
- 2014 **Laboratory of Algebraic geometry and its application, SU-HSE**, Moscow, Russia.
 (4 weeks)
- 2014 **Institut Henri Poincaré**, Paris, France.
 Research in Paris Program “AGT conjecture on ALE spaces by means of framed sheaves” (6 weeks)

Conference Talks

- 2024 **Enumerative Geometry in East Asia 2024**, *KIAS*, Korea.
 (expected)
- 2024 **Workshop on Representation Theory and Mathematical Physics**, *Università degli Studi di Parma*, Italy.
 (expected)
- 2024 **Hopf Algebras and Monoidal Categories**, *Università degli Studi di Ferrara*, Italy.
- 2024 **Algebraic structures in gauge theory and geometry**, *Lorentz Center*, Leiden, The Netherlands.
- 2023 **Categorified Enumerative Geometry and Representation Theory**, *EPFL*, Lausanne, Switzerland.
- 2023 **Motives in moduli and representation theory**, *Radboud University*, Nijmegen, The Netherlands.
- 2023 **Gauge Theory, Moduli Spaces and Representation Theory**, *Kavli IPMU, the University of Tokyo*, Japan.
- 2023 **Workshop on gauge theoretic moduli spaces and vertex algebras**, *The University of Auckland*, New Zealand.
- 2022 **Enumerative Invariants, Quantum Fields and String Theory Correspondences**, *Mittag-Leffler Institute*, Sweden.
- 2022 **Interactions between Algebraic Geometry and Noncommutative Algebra**, *MFO*, Oberwolfach, Germany.
- 2019 **Algebra and Representation Theory in the North**, *University of Edinburgh*, UK.
- 2019 **XXI Congresso dell’Unione Matematica Italiana (Lie theory section)**, *Università degli Studi di Pavia*, Italy.
- 2019 **Cohomological Hall algebras in Mathematics and Physics**, *Perimeter Institute for Theoretical Physics*, Waterloo, Canada.
- 2018 **A conference on character varieties and quantisation**, *University of Auckland*, New Zealand.
- 2018 **VBAC 2018: Gauge Theory and Complex Geometry**, *CIRM*, Luminy, France.
 (one-hour contributed talk)
- 2017 **Geometric Representation Theory**, *University of Glasgow*, UK.
- 2017 **Quantum groups, Special functions and Integrable Systems**, *LMPT*, Tours, France.
- 2017 **Hitchin Systems in Mathematics and Physics**, *Perimeter Institute for Theoretical Physics*, Waterloo, Canada.
- 2016 **Christmas Workshop on Quivers, Moduli Spaces and Integrable Systems**, *Università degli Studi di Genova*, Italy.
- 2015 **Workshop on Algebraic Varieties**, *Fields Institute*, Toronto, Canada.

- 2014 **Workshop on DAHA, Hall Algebras, Torus Knots and Combinatorics**, *Université de Paris-Saclay*, Paris, France.
- 2013 **Workshop on Algebraic Analysis and Geometry**, *Università degli Studi di Padova*, Italy.
- 2012 **Christmas Workshop on Moduli Spaces and Integrable Systems**, *Università degli Studi di Genova*, Italy.
- 2012 **String-Math 2012**, *Hausdorff Center for Mathematics*, Bonn, Germany.
(20-min contributed talk)
- 2012 **Workshop on Geometry, Integrability, Quantization**, *SISSA*, Trieste, Italy.
- 2011 **4rd Workshop on Geometric Methods in Theoretical Physics**, *SISSA*, Trieste, Italy.
- 2010 **Workshop on Categorical Methods in Geometry and Gauge Theory**, *Chern Institute of Mathematics*, Nankai University, China.
- 2010 **3rd Workshop on Geometric Methods in Theoretical Physics**, *SISSA*, Trieste, Italy.

Colloquia

- 2019 Higher School of Economics, Moscow
- 2018 Hong Kong Geometry Colloquium
- 2017 SISSA - Trieste
- 2016 Kansas State University
- 2015 Georgia Southern University

Seminar Talks

- 2025 Hong Kong University of Science and Technology (Algebra and Geometry Seminar) – expected
- 2024 Kansas State University (M-Seminar) – expected, The Galileo Galilei Institute for Theoretical Physics (Program “BPS Dynamics and Quantum Mathematics”), ICTP (Mathematics Seminar), MIT (Special Seminar), Kavli IPMU (Mathematics - String Theory Seminar)
- 2023 ICMAT (Geometry Seminar), SISSA - Trieste (Algebraic Geometry and Mathematical Physics Seminar), Università di Milano La Statale (Incontri di geometria algebrica ed aritmetica Milano - Pisa), Università di Modena e Reggio Emilia (Algebra Seminar)
- 2022 Jagiellonian University (Algebra Seminar), Universidad Nacional de Colombia (Algebraic Geometry Seminar), Università di Roma La Sapienza (Algebra and Geometry Seminar), Università di Bologna (Algebra and Geometry Seminar), Virginia Commonwealth University (Geometry and Topology Seminar)
- 2021 UC Davis (Algebraic Geometry Seminar), Freie Universität Berlin (Algebraic Geometry and Complex Analysis Seminar)
- 2020 The RepNet Virtual Seminar, Università di Roma “Tor Vergata” (Algebra and Representation Theory Seminar), Università degli Studi di Bologna (Algebra and Geometry Seminar), Università di Pisa (Algebraic and Arithmetic Geometry Seminar)
- 2019 Università degli Studi di Firenze (Seminario di Geometria), University of Sheffield (Algebraic Geometry Seminar), University of York (Algebra Seminar), Kavli IPMU (GTM Seminar), Rutgers University (Geometry, Symmetry and Physics Seminar), Northeastern University (Geometry, Physics, and Representation Theory Seminar)
- 2018 University of Edinburgh (EDGE Seminar), Université de Strasbourg (Séminaire Quantique), Université de Grenoble (Séminaire de Algèbre et Géométries), Scuola Normale Superiore - Pisa, Università degli Studi di Firenze (Seminario di Geometria), Kavli IPMU (GTM Seminar)
- 2017 Rutgers University (Geometry, Symmetry and Physics Seminar), MIT (Geometric Representation Theory), Centre for Quantum Geometry of Moduli Spaces - Aarhus (Aarhus Differential Algebraic Geometry Seminars), Department of Physics and Astronomy - Uppsala University, Institut de Mathématiques de Jussieu and ENS - Paris (Séminaire de Géométrie Algébrique), Institut de Mathématiques de Bourgogne - Dijon (Séminaire de Géométrie et Systèmes Dynamiques), Institut Henri Poincaré - Paris (Séminaire de Géométrie et Quantification), Institut Élie Cartan de Lorraine (Séminaire de Analyse, Géométrie et Algèbre), Kavli IPMU (GTM Seminar)

- 2016 University of Waterloo (Geometry and Topology Seminar), Université Lille 1 (Séminaire de Géométrie Algébrique), Université d'Angers (Séminaire de Géométrie Algébrique), SISSA - Trieste (Geometry Seminar), Università degli Studi di Torino (Seminari di Algebra e Geometria Algebrica), University of British Columbia (Algebra and Algebraic Geometry Seminar), Institut de Mathématiques de Jussieu - Paris (Séminaire Groupes, Représentations et Géométrie), Université de Grenoble (Séminaire de Algèbre et Géométries)
- 2015 Perimeter Institute for Theoretical Physics (Geometric Representation Theory Seminar), Fields Institute - Toronto (Geometric Representation Theory Seminar), University of Pennsylvania (Math-Physics Joint Seminar), Rutgers University (Geometry, Symmetry and Physics Seminar), University of Western Ontario (Geometry and Topology Seminar, Noncommutative Geometry Seminar and Algebra Seminar)
- 2014 LPTHE - Université Pierre et Marie Curie - Paris, University of Waterloo (Geometry and Topology Seminar), University of Western Ontario (Geometry and Topology Seminar), SISSA - Trieste (Geometry Seminar), Laboratory of Algebraic geometry and its application - SU-HSE - Moscow (Geometric Representation Theory Seminar and Seminar on Geometric Structures on Manifolds), Université de Nice Sophia-Antipolis (Séminaire d'Algèbre, Topologie et Géométrie), University of Luxembourg (Seminar in Algebra, Geometry, and Quantization), Université de Rennes 1 (Séminaire de Géométrie Algébrique), Institut de Mathématiques de Jussieu - Paris (Séminaire Caen Cergy Clermont Paris - Théorie des Représentations and Séminaire de Géométrie Algébrique), University of Edinburgh (EDGE Seminar)
- 2013 Maxwell Institute for Mathematical Sciences - Edinburgh, Université d'Angers (Séminaire de Physique Mathématique), Université de Grenoble (Séminaire de Algèbre et Géométries)
- 2012 Maxwell Institute for Mathematical Sciences - Edinburgh, Université Lille 1 (Séminaire de Géométrie Algébrique), SISSA - Trieste (Students' Seminar in Algebraic Geometry - expository talk)
- 2011 Université Lille 1 (Séminaire de Géométrie Algébrique), Université d'Angers (Séminaire de Physique Mathématique), Université de Grenoble (Séminaire de Algèbre et Géométries), Université de Nantes (Séminaire de Topologie, Géométrie et Algèbre)

Organizational Activities

Conferences, Workshops, and Schools

- 2025 **Summer School on "Enumerative Geometry and Geometric Representation Theory"** (organized with M. Talpo), *Università di Pisa*, Italy.
- 2025 **Enumerative geometry, representation theory, and physics** (organized with Y. Toda and M. Yamazaki), *Kavli IPMU*, Tokyo, Japan.
- 2024 **Ricercatori in Algebra e Geometria 2024** (organized with A. Appel, F. Binda, L. Pertusi, R. Svaldi, and M. Talpo), *Università di Milano La Statale*, Italy.
- 2024 **Quantization in Representation Theory, Derived Algebraic Geometry, and Gauge Theory** (organized with A. Appel, L. Bossinger, G. Felder, M. Porta, and O. Schiffmann), *SwissMAP Research Station*, Les Diableretes, Switzerland.
- 2023 **Ricercatori in Algebra e Geometria 2023** (organized with A. Appel, F. Binda, L. Capuano, and M. Talpo), *Università di Roma 3*, Italy.
- 2022 **Ricercatori in Algebra e Geometria 2022** (organized with A. Appel, A. Lerario, S. Scherotzke, N. Sibilla, and M. Talpo), *SISSA*, Trieste, Italy.
- 2022 **Workshop on "Geometry and Arithmetics of Moduli Spaces"** (organized with A. Bandini, T. Szamuely, and M. Talpo), *Università di Pisa*, Italy.
- 2022 **"Geometric Representation Theory", virtual ICM 2022 Satellite Conference** (organized with T. Arakawa, J. Kamnitzer, H. Nakajima, M. Reineke, and V. Serganova), *Kavli IPMU*, Tokyo, Japan. (Online conference with around 350 participants)
- 2022 **CIRM Workshop on "New Perspectives on Hyperkähler Manifolds". A Celebration of Dimitri Markushevich's (60+2)nd Birthday** (organized with U. Bruzzo and G. Menet), *CIRM*, Levico Terme, Italy.
- 2021 **Ricercatori in Algebra e Geometria 2020** (organized with A. Appel, A. Hochenegger, M. Porta, S. Scherotzke, and M. Talpo), *Scuola Normale Superiore*, Pisa, Italy. (Postponed from 2020 to 2021 due to the COVID-19 pandemic)

- 2021 **IHÉS Summer School on Enumerative Geometry, Physics and Representation Theory** (organized with A. Negut and O. Schiffmann), *IHÉS*, France.
(School offered in a blended format with around 350 participants)
- 2021 **Quantization in Derived Algebraic Geometry and Representation Theory** (organized with A. Appel, M. Porta, and O. Schiffmann), *BIRS - Casa Matématica Oaxaca*, Mexico.
(Cancelled due to the COVID-19 pandemic.)
- 2019 **Moduli spaces, Representation theory and Quantization** (organized with D. Baraglia, P. Hekmati, T. Mochizuki, and M.-H. Saito), *RIMS*, Kyoto, Japan.
- 2019 **Representation Theory, Gauge Theory, and Integrable Systems** (organized with H. Nakajima, Y. Tachikawa, and Y. Yoshida), *Kavli IPMU*, Tokyo, Japan.
- 2018 **CIME School on Geometric Representation Theory and Gauge Theory** (organized with U. Bruzzo and A. Grassi), Cetraro, Italy.
- 2017 **School and Workshop on Higgs moduli spaces and character varieties (SWAGP2017)** (organized with U. Bruzzo, F. Rodriguez Villegas, and J. Stoppa), *SISSA*, Trieste, Italy.
- 2017 **Workshop “From students to mathematicians: an excellence Master program in Trieste”** (organized with D. Barilari, F. Fanelli, A. Lerario, et al.), *SISSA and Università degli Studi di Trieste*, Italy.
- 2016 **Hall algebras, enumerative invariants and gauge theories** (organized with J. Kamnitzer and O. Schiffmann), *Fields Institute*, Toronto, Canada.
- 2015 **Moduli Spaces in Algebraic Geometry and Mathematical Physics** (organized with U. Bruzzo, E.-D. Diaconescu, F. Perroni, and C. Bai), *Chern Institute of Mathematics*, Tianjin, China.
- 2015 **Interactions between Geometry and Physics. A conference in honor of Ugo Bruzzo’s 60th birthday** (organized with M. Jardim, F. Perroni, et al.), Guarujá, São Paulo, Brazil.
- 2014 **Instanton Counting: Moduli Spaces, Representation Theory and Integrable Systems** (organized with U. Bruzzo, D. Markushevich, V. Rubtsov, and S. Shadrin), *Lorentz Center*, Leiden, The Netherlands.
- 2013 **VBAC2013 (2013 meeting of the Vector Bundles on Algebraic Curves Group). Hilbert Schemes, Sheaves and Representation Theory** (organized with U. Bruzzo, et al.), *SISSA*, Trieste, Italy.

Online Seminars

- 2021–2021 **(Italian) Online Representation Theory Seminar** (co-organizer), *website: grt.cs.dm.unipi.it/online-representation-theory-seminar*.
- 2020–2021 **Geometry and Representation Theory at Home** (co-organizer), *website: grt-home.org*.

Departmental Seminars

- 2020–Present **Seminar on Combinatorics, Lie Theory, and Topology** (co-organizer), *Università di Pisa*, Italy.
- 2015–2016 **Geometry and Topology Seminar** (co-organizer), *University of Western Ontario*, Canada.

Supervision

Ph.D. Student

- 2010–2013 **Mattia Pedrini** (co-supervised with U. Bruzzo), *SISSA (Trieste, Italy)*, Thesis: *Moduli spaces of framed sheaves on stacky ALE spaces, deformed partition functions and the AGT conjecture*.
Presently, Data Scientist at CGnal, Milan, Italy

Master’s Degree Thesis

- 2024 **Anna Borri**, *Università di Pisa (Italy)*, Thesis: *Perverse coherent sheaves and derived equivalences*, in progress.
Starting in the Fall 2024, she will be a Ph.D. student at Universität Duisburg-Essen, Germany.
- 2024 **Luca Morstabilini**, *Università di Pisa (Italy)*, Thesis: *Counting indecomposable vector bundles and stable Higgs sheaves over smooth curves*, defended in February 2024.
Starting in the Fall 2024, he will be a Ph.D. student at SISSA, Trieste.
- 2023 **Nicolò Bignami**, *Università di Pisa (Italy)*, Thesis: *On the Beauville-Voisin conjecture for Hilbert schemes of points on K3 surfaces*, defended in October 2023.
Presently, a Ph.D. student at SISSA, Trieste.

- 2023 **Davide Ferri**, *Università di Pisa (Italy)*, Thesis: *Algebraic Structures Related to The Dynamical Yang-Baxter Equation*, defended in June 2023.
joint degree with Hokkaido University, co-supervised with Y. Shibukawa.
Presently, a Ph.D. student at Università di Torino.
- 2022 **Francesca Pratali**, *Università di Pisa (Italy)*, Thesis: *Dendroidal ∞ -operads*, defended in September 2022.
co-supervised with E. Hoffbeck (Université Sorbonne Paris Nord).
Presently, a Ph.D. student at LAGA, Université Sorbonne Paris Nord.

Bachelor's Degree Thesis

- 2022 **Edoardo Ciminelli**, *Università di Pisa (Italy)*, Thesis: *Rappresentazioni di gruppi di Lie compatti e il teorema di Peter-Weyl*, defended in September 2022.
- 2021 **Davide Chionna**, *Università di Pisa (Italy)*, Thesis: *Classificazione delle algebre di Lie semisemplici su campi algebricamente chiusi*, defended in September, 2021.
- 2021 **Nicolò Bignami**, *Università di Pisa (Italy)*, Thesis: *Rappresentazioni di quivers e teorema di Gabriel*, defended in September, 2021.
- 2021 **Chiara Valentina Gaetano**, *Università di Pisa (Italy)*, Thesis: *Fibrati vettoriali, classi di Chern e la loro relazione con la coomologia della Grassmanniana*, defended in May, 2021.

Ph.D. defense committee member

- 2024 **Robert Hanson**, *Instituto Superior Técnico, Universidade de Lisboa, Portugal*.
- 2021 **Lucien Hennecart**, *Université de Paris-Saclay, Paris, France*.

Teaching

Graduate Courses - Ph.D. Level

- 2025 **Derived categories and applications to Geometric Representation Theory**, *Università di Pisa, Italy*.
(expected)
- 2024 **Quotients and moduli spaces**, *Università di Pisa, Italy*.
Taught together with Mattia Talpo.
- 2021 **Yangians in geometry and representation theory**, *Università di Pisa, Italy*.
Joint course with Università di Parma and Università di Roma Tor Vergata.
- 2009–2010 **Sheaf theory and metrics on fiber bundles**, (*Teaching assistant*), *SISSA, Italy*.

Undergraduate - Università di Pisa, Italy

- 2024–2025 **Analisi Matematica 1**, (*Calculus I for Engineers*).
(expected) *Laurea Triennale in Ingegneria Biomedica*
- 2023–2024 **Analisi Matematica 1**, (*Calculus I for Engineers*).
Laurea Triennale in Ingegneria Biomedica
- 2022–2023 **Analisi Matematica 1**, (*Calculus I for Engineers*).
Laurea Triennale in Ingegneria Biomedica
- 2021–2022 **Analisi Matematica 1**, (*Calculus I for Engineers*).
Laurea Triennale in Ingegneria Biomedica
- 2020–2021 **Analisi Matematica 1**, (*Calculus I for Engineers*).
Laurea Triennale in Ingegneria Biomedica
- 2019–2020 **Geometria 2**, (*Topics: general topology, fundamental group, and complex analysis*).
Laurea Triennale in Matematica

Undergraduate - University of Western Ontario, Canada

- 2016 **Math 1228 B**, *Methods of Finite Mathematics*.
- 2015 **Math 1229 A**, *Methods in Matrix Algebra*.
- 2015 **Calculus 1301 B**, *Calculus II*.
- 2014 **Math 1229 A**, *Methods in Matrix Algebra*.

Undergraduate - Università degli Studi di Trieste, Italy

2010–2011 **Algebra I**, (*Teaching assistant*).
Laurea Triennale in Matematica

Other Academic Activities

Referee

Adv. Math., Bull. Sci. Math., Crelle's Journal, Comm. Math. Phys., Duke Math. J., Épijournal Geom. Algébrique, Int. Math. Res. Not. IMRN, J. Algebra, J. Algebraic Geom., J. Geom. Phys., J. Inst. Math. Jussieu, J. Pure Appl. Algebra, Lett. Math. Phys., Math. Res. Lett., Math. Z., Proc. Edinburgh Math. Soc, Sel. Math. New Ser., Mosc. Math. J., SIGMA, Tunis. J. Math.

Reviewer

ANR (2024), NWO Talent Program (2022)

University and Departmental Services

- 2024–Present **Third Mission Committee** (member), *Università di Pisa*, Italy.
- 2023–Present **Computing Facility Committee** (member), *Università di Pisa*, Italy.
- 2023–Present **Board of the Ph.D. Programme** (member), *Università di Pisa*, Italy.
- 2023–Present **Review committee for the Ph.D. course** (member), *Università di Pisa*, Italy.
- 2023–Present **Department's website content maintainer**, *Università di Pisa*, Italy.
- 2023–Present **Tutoring Committee at the School of Engineering of the University of Pisa** (member), *Università di Pisa*, Italy.
- 2021–2023 **Department Colloquium Committee** (member), *Università di Pisa*, Italy.
- 2014–2015 **International Postdoctoral Representative at the Postdoctoral Association at Western**, *University of Western Ontario*, Canada.
- 2008–2011 **Students' Representative at the Mathematical Physics Sector**, *SISSA*, Trieste, Italy.
- 2006–2008 **Students' Representative at the Dipartimento di Matematica**, *Università degli Studi di Trieste*, Italy.

Memberships

- 2009–Present **GNSAGA-INdAM**.

Languages

- Italian Mother tongue
- English Fluent knowledge
- French Fair knowledge
- Spanish Fluent knowledge

Updated on September 10th, 2024