

Luca Schaffler, Curriculum Vitae

Department of Mathematics and Physics
Roma Tre University
L.go S. L. Murialdo 1, 00146 Rome, Italy

Office: 310
Email: luca.schaffler@uniroma3.it
Web: <https://ricerca.matfis.uniroma3.it/users/lSchaffler/>

Positions Held

- *Limited time researcher of type B* (equivalent to tenure-track), Roma Tre University
Dates: March 1, 2022 – present
Since February 1, 2023: *Rita Levi Montalcini Fellow*
- Postdoc, KTH Royal Institute of Technology
Dates: August 17, 2020 – February 28, 2022
Research mentor: Prof. Sandra Di Rocco
- Marshall H. Stone Visiting Assistant Professor, University of Massachusetts Amherst
Dates: September 1, 2017 – August 31, 2020
Research mentor: Prof. Jenia Tevelev

Education

- Ph.D. Mathematics, University of Georgia, 2012 – 2017
Thesis title: The KSBA Compactification of a 4-dimensional Family of Polarized Enriques Surfaces
Advisor: Prof. Valery Alexeev
- M.S. Mathematics, Roma Tre University, 2010 – 2012
Grade: 110/110 cum laude
- B.S. Mathematics, Roma Tre University, 2007 – 2010
Grade: 110/110 cum laude

Preprints

- Alessio Caminata, Han-Bom Moon, and Luca Schaffler. *Determinantal varieties from point configurations on hypersurfaces*, (2022). Submitted. [arXiv:2211.13177](https://arxiv.org/abs/2211.13177).
- Sandra Di Rocco, Lukas Gustafsson, and Luca Schaffler. *Gaussian likelihood geometry of projective varieties*, (2022). Submitted, revised, awaiting final decision. [arXiv:2208.12560](https://arxiv.org/abs/2208.12560).

Publications

- Patricio Gallardo, Gregory Pearlstein, Luca Schaffler, and Zheng Zhang. *Unimodal singularities and boundary divisors in the KSBA moduli of a class of Horikawa surfaces*, (2022). To appear in **Matematische Nachrichten**. [arXiv:2209.08877](https://arxiv.org/abs/2209.08877).

- Riccardo Moschetti, Franco Rota, and Luca Schaffler. *A computational view on the non-degeneracy invariant for Enriques surfaces*. **Experimental Mathematics**. Published online: 29 August 2022.
- Sandra Di Rocco and Luca Schaffler. *Families of pointed toric varieties and degenerations*. **Mathematische Zeitschrift** 301 (2022), no. 4, 4119–4139.
- Luca Schaffler and Jenia Tevelev. *Compactifications of moduli of points and lines in the projective plane*. **International Mathematics Research Notices** 2022, no. 21, 17000–17078.
- Patricio Gallardo, Matt Kerr, and Luca Schaffler. *Geometric interpretation of toroidal compactifications of moduli of points in the line and cubic surfaces*. **Advances in Mathematics** 381, 16 April 2021.
- Alessio Caminata, Noah Giansiracusa, Han-Bom Moon, and Luca Schaffler. *Point configurations, phylogenetic trees, and dissimilarity vectors*. **Proceedings of the National Academy of Sciences of the United States of America (PNAS)** March 23, 2021 118 (12).
- Kuan-Wen Lai, Yu-Shen Lin, and Luca Schaffler. *Decomposition of Lagrangian classes on K_3 surfaces*. **Mathematical Research Letters** 28 (2021), no. 6, 1739–1763.
- Alessio Caminata and Luca Schaffler. *A Pascal's theorem for rational normal curves*. **Bulletin of the London Mathematical Society** 53 (2021), no. 5, 1470–1485.
- Han-Bom Moon and Luca Schaffler. *KSBA compactification of the moduli space of K_3 surfaces with a purely non-symplectic automorphism of order four*. **Proceedings of the Edinburgh Mathematical Society** (2) 64 (2021), no. 1, 99–127.
- Alessio Caminata, Noah Giansiracusa, Han-Bom Moon, and Luca Schaffler. *Equations for point configurations to lie on a rational normal curve*. **Advances in Mathematics** 340 (2018), 653–683.
- Luca Schaffler. *K_3 surfaces with \mathbb{Z}_2^2 symplectic action*. **Rocky Mountain Journal of Mathematics** 48 (2018), no. 7, 2347–2383.
- Luca Schaffler. *The KSBA compactification of the moduli space of $D_{1,6}$ -polarized Enriques surfaces*. **Mathematische Zeitschrift** 300 (2022), no. 2, 1819–1850.
- Luca Schaffler. *On the cone of effective 2-cycles on $\overline{M}_{0,7}$* . **European Journal of Mathematics** 1 (2015), no. 4, 669–694.

Qualification

- Italian national habilitation to the rank of associate professor. Awarded by the Italian Ministry of University and Research on May 29, 2023.

Awards and Funding

- GNSAGA Project "Numerical Invariants of Nodal Enriques Surfaces." Awarded by the *Istituto Nazionale di Alta Matematica "Francesco Severi"* (INdAM). Amount awarded: €3500. Awarded on March 13, 2023. Co-applicant.
- Rita Levi Montalcini Grant "Birational geometry of compact moduli spaces via singularity theory and point configurations." Awarded by the Italian Ministry of University and Research. Amount awarded: €202827,59. Awarded on Aug 25, 2022. Principal applicant.

https://bandomontalcini.cineca.it/ProgGiovRic/dm250822_1039.pdf

- Personal research budget for 2022, Roma Tre University. Assigned: €1500 (maximum).
- Collaborate@ICERM project "Point Configurations on Projective Varieties." Amount awarded: Funding for travel to ICERM and accommodation. Awarded on Oct 7, 2021 (the event took place on Jan 9–13, 2023). Co-applicant.
- KTH travel fund, Academic Year 2021–2022, 20000 SEK.
- Research Support Fund, Massachusetts Society of Professors, Academic Year 2019–2020, \$1000.
- Research Support Fund, Massachusetts Society of Professors, Academic Year 2018–2019, \$1000.
- Marshall H. Stone Visiting Assistant Professor travel funding, \$2000 per academic year, 2017 – 2020.
- Dissertation Completion Award. Awarded by the University of Georgia. Amount awarded: \$14720 (funding for Fall 2016 – Spring 2017). Awarded on May 19, 2016. Principal applicant.
- William Armor Wills Memorial Scholarship Award, University of Georgia, Department of Mathematics, April 2016, \$1000.
- Outstanding Graduate Teaching Assistant Award, University of Georgia, April 2016.
- NSF Funding (PI: Valery Alexeev), University of Georgia, Fall 2015, Summer 2016 and 2017.
- RTG Funding, University of Georgia, Spring 2016.
- Graduate School Research Assistantship, University of Georgia, Summer 2013, 2014, and 2015.
- Graduate Student Teaching Assistantship, University of Georgia, Fall 2012 – Spring 2015.

Teaching Experience

- **Roma Tre University**

Main instructor

- Riemannian Geometry, GE430, master's degree course, Fall 2023.
- Algebraic Geometry 2, GE510, master's degree course, Spring 2023.
- Compactifications of Moduli Spaces, PhD course, joint between Sapienza, Tor Vergata, and Roma Tre, Fall 2022. Link to course webpage:
https://ricerca.mat.uniroma3.it/users/lshaffler/compact_moduli_spaces_fall_2022.html
- Riemannian Geometry, GE430, master's degree course, Spring 2022.

Teaching assistant

- Geometry and Linear Algebra 2, GE210, Fall 2023.
- Elements of Advanced Geometry, GE310, Fall 2023.
- Topology, GE220, Spring 2023.
- Elements of Advanced Geometry, GE310, Fall 2022.

- **KTH Royal Institute of Technology**

Main instructor (the following courses were joint between KTH and Stockholm University)

- Commutative Algebra and Algebraic Geometry, MM7042, master's degree course, Fall 2021 (co-taught with Timothy Hosgood).
- Intersection Theory and Moduli Spaces, PhD course, Term 4, Spring 2021. Link to course webpage:
https://ricerca.mat.uniroma3.it/users/lshaffler/intersection_theory_and_moduli_spaces_spring_2021.html

Teaching assistant

- Discrete Mathematics, SF1610, Term 4, Spring 2021.
- Calculus in One Variable, SF1685, Term 3, Spring 2021.

- **University of Massachusetts Amherst**

Main instructor

- Multivariate Calculus, MATH 233, one section, Spring 2020.
- Fundamental Concepts of Mathematics, MATH 300, two sections, Fall 2019.
- Fundamental Concepts of Mathematics, MATH 300, one section, Spring 2019.
- Introduction to Abstract Algebra I, MATH 411, two sections, Fall 2018.
- Fundamental Concepts of Mathematics, MATH 300, one section, Spring 2018.
- Multivariate Calculus, MATH 233, two sections, Fall 2017.

- **University of Georgia**

Main instructor

- Calculus I for Science and Engineering, MATH 2250, one section, Spring 2015.
- Precalculus, MATH 1113, one section, Fall 2014.

Teaching assistant for Analytic Geometry and Calculus, MATH 2200, Fall 2013.

Grader

- Real Analysis I, MATH 8100, Fall 2014
- Graph Theory, MATH 4690/6690, Spring 2014
- Modern Algebra and Geometry I, MATH 4000/6000, Fall 2013
- Point Set Topology, MATH 4200/6200, Spring 2013
- Algebraic Topology, MATH 8200, Spring 2013, Spring 2014
- Combinatorics, MATH 4670/6670, Fall 2012
- Real Analysis, MATH 4100/6100, Fall 2012

Tutor for the Precalculus and Calculus courses (Study Hall), 2012 – 2014.

Invitations to Programs and Workshops

- Invited participant to the workshop *Moduli and Algebraic Cycles*, Institut Mittag-Leffler, Stockholm, May 29–June 2, 2023.
- Invited participant to the workshop *Explicit Moduli Problems in Higher Dimensions*, Banff International Research Station for Mathematical Innovation and Discovery, Banff, February 26–March 3, 2023.
- Invited participant to the workshop *Toric Degenerations*, Banff International Research Station for Mathematical Innovation and Discovery, Banff, December 4–9, 2022.
- Invited participant to the research program *Moduli and Algebraic Cycles*, Institut Mittag-Leffler, Stockholm, August 30–December 10, 2021.
- Invited participant to the workshop *Positivity of Cycles*, American Institute of Mathematics, San Jose, August 1–5, 2016.

Invited Conference Talks

- Explicit Moduli Problems in Higher Dimensions, Banff International Research Station for Mathematical Innovation and Discovery, Banff, March 2, 2023.
- Winter Meeting in Algebra and Geometry, Roma Tre University, Rome, December 20, 2022.
- Moduli Day, Max Planck Institute for Mathematics in the Sciences, Leipzig, November 7, 2022.

- XMaths Workshop 2021, Università degli Studi di Bari Aldo Moro, Bari, December 21, 2021.
- Moduli spaces and logarithmic geometry, Institut Mittag-Leffler, Stockholm, November 19, 2021.
- Hodge Theory, Arithmetic and Moduli II, Texas A&M University, College Station, February 8, 2020.
- PIMS Symposium on Hodge Theory, Arithmetic and Moduli, University of British Columbia, Vancouver, May 15, 2019.
- BATMOBYLE, Amherst College, Amherst, May 2, 2019.
- Hodge Theory, Moduli and Representation Theory, Stony Brook University, August 17, 2017.
- Workshop on Algebraic Varieties, Hodge Theory and Motives, Fields Institute, Toronto, March 12, 2017.
- Focused Research Group on Hodge Theory, Moduli and Representation Theory: Workshop VIII, Washington University in St. Louis, St. Louis, January 8, 2017.
- American Institute of Mathematics, Workshop on Positivity of Cycles, San Jose, August 4, 2016.
- "Giornate di Geometria Algebrica ed Argomenti Correlati XIII", University of Catania, Catania, Italy, May 25, 2016.

Invited Seminar Talks

- University of Genova, Algebra & Geometry Seminar, Genova, April 19, 2023.
- University of Glasgow, Algebra and Number Theory Seminar, Glasgow, February 8, 2023.
- University of Massachusetts Amherst, Valley Geometry Seminar, Amherst, January 20, 2023.
- University of Connecticut, Algebra Seminar, Storrs, January 18, 2023.
- University of Nottingham, Online Algebraic Geometry Seminar, **online**, July 28, 2022.
- Università di Pisa, Algebraic and Arithmetic Geometry Seminar, Pisa, May 4, 2022.
- Tata Institute of Fundamental Research, Colloquium, **online**, January 22, 2021.
- University of California Riverside, UC Riverside Algebraic Geometry Seminar, **online**, January 19, 2021.
- University of California Riverside – Washington University in St. Louis, Mini-Seminar on Compactifications, **online**, October 1, 2020.
- University of Georgia, Algebraic Geometry Seminar, **online**, September 30, 2020.
- Rutgers University, Algebra Seminar, **online**, April 29, 2020.
- KTH Royal Institute of Technology, Fika webinar, **online**, April 23, 2020.
- Texas A&M University, Algebra and Combinatorics Seminar, College Station, February 7, 2020.
- Washington University in St. Louis, Algebraic Geometry Seminar, St. Louis, January 15, 2020.
- Pontificia Universidad Católica de Chile, Algebraic Geometry Seminar, Santiago, January 8, 2020.
- Duke University, Algebraic Geometry Seminar, Durham, August 30, 2019.
- Sapienza University of Rome, Algebra and Geometry Seminar, Rome, June 26, 2019.
- Washington University in St. Louis, Algebraic Geometry Seminar, St. Louis, February 27, 2019.
- University of Connecticut, Algebra Seminar, Storrs, November 14, 2018.
- Universitat de Barcelona, Barcelona Algebraic Geometry Seminar, Barcelona, June 8, 2018.
- Yale University, Yale Algebraic and Tropical Geometry Seminar, April 26, 2018.
- Northeastern University, Geometry, Physics, and Representation Theory Seminar, April 5, 2018.
- Stony Brook University, Algebraic Geometry Seminar, October 4, 2017.

- Colorado State University, FRAGMENT seminar, Fort Collins, May 4, 2017.
- Nagoya University, Algebraic Geometry Seminar, Nagoya, April 17, 2017.
- Kyoto University, Algebraic Geometry Seminar, Kyoto, April 14, 2017.
- Duke University, Algebraic Geometry Seminar, Durham, February 17, 2017.
- Leibniz Universität Hannover, Research Seminar Algebraic Geometry, Hannover, Germany, December 21, 2016.
- University of Utah, Algebraic Geometry Bootcamp, research group talk, Salt Lake City, July 2015.
- Roma Tre University, Algebraic Geometry Seminar, Rome, Italy, June 4, 2015.

Conference Contributed Talks and Poster Presentations

- (Talk) MEGA 2022, Effective Methods in Algebraic Geometry, Pedagogical University of Cracow, Cracow, June 23, 2022.
- (Poster) "Riposte Armonie": Algebraic Geometry in Cetraro 2021 together with Ciro Ciliberto, September 22, 2021.
- (Poster) AGNES, Stony Brook University, **online**, October 24, 2020.
- (Poster) Ideals, Varieties, Applications: Celebrating the Influence of David Cox, Amherst College, June 11, 2019.
- (Poster) AGNES, Brown University, September 22, 2018.
- (Poster) Birational Geometry and Moduli Spaces, INdAM, June 14, 2018.
- (Poster) AGNES, Northeastern University, October 14, 2017.
- (Talk) Joint Mathematics Meetings, AMS Contributed Paper Session on Algebraic Geometry, Atlanta, January 6, 2017.
- (Poster) AGNES, University of Massachusetts Amherst, November 5, 2016.
- (Poster) WAGS, Colorado State University, October 15, 2016.
- (Poster) AGNES, Brown University, October 3, 2015.

Talks for general audience

- The "What Is ...?" Graduate Seminar (TWIGS), University of Massachusetts Amherst, February 16, 2021. Title: *What is a secondary polytope?*
- Undergraduate Math Club Talk, University of Massachusetts Amherst, October 10, 2018. Title: *Precalculus of lines and conics in the projective plane.*

Conferences/Workshops Attended

- Winter Meeting in Algebra and Geometry, Roma Tre University, Rome, December 19–21, 2022.
- Moduli Day, Max Planck Institute for Mathematics in the Sciences, Leipzig, November 7, 2022.
- Complex Algebraic Geometry and related topics, in honor of Fabrizio Catanese on the occasion of his 70th birthday, Palazzo Feltrinelli, Gargnano del Garda, September 19–23, 2022.
- MEGA 2022, Effective Methods in Algebraic Geometry, Pedagogical University of Cracow, Cracow, June 20–24, 2022.

- Algebraic Geometry in Roma Tre, on the occasion of Sandro Verra's 70th birthday, Roma Tre University, Rome, June 14–17, 2022.
- XMaths Workshop 2021, Università degli Studi di Bari Aldo Moro, Bari, December 21–22, 2021.
- Moduli spaces and logarithmic geometry, Institut Mittag-Leffler, Stockholm, November 15–19, 2021.
- Motives and Hodge theory, Institut Mittag-Leffler, Stockholm, October 18–22, 2021.
- "Riposte Armonie": Algebraic Geometry in Cetraro 2021 together with Ciro Ciliberto, Cetraro, September 21–24, 2021.
- K_3 surfaces and hyperkähler manifolds, Università degli Studi di Milano, **online**, June 9, 2021.
- AGNES, Stony Brook University, **online**, October 23–25, 2020.
- Hodge Theory, Arithmetic and Moduli II, Texas A&M University, College Station, February 8–9, 2020.
- AGNES, Boston College, Chestnut Hill, September 20–22, 2019.
- Ideals, Varieties, Applications: Celebrating the Influence of David Cox, Amherst College, Amherst, June 10–14, 2019.
- PIMS Symposium on Hodge Theory, Arithmetic and Moduli, University of British Columbia, Vancouver, May 13–17, 2019.
- Recent Progress in Moduli Theory, MSRI, Berkeley, May 6–10, 2019.
- BATMOBYLE, Amherst College, Amherst, May 2, 2019.
- AGNES, University of Massachusetts Amherst, Amherst, March 22–24, 2019.
- AGNES, Brown University, Providence, September 21–23, 2018.
- Combinatorial Algebraic Geometry Retrospective Workshop, Fields Institute, Toronto, June 18–22, 2018.
- Birational Geometry and Moduli Spaces, INdAM, Rome, June 11–15, 2018.
- AGNES, Rutgers University, New Brunswick, April 13–15, 2018.
- Georgia Algebraic Geometry Symposium, Georgia Institute of Technology, Atlanta, February 23–25, 2018.
- AGNES, Northeastern University, Boston, October 13–15, 2017.
- Conference on Birational Geometry, Simons Foundation, New York, August 21–25, 2017.
- Hodge Theory, Moduli and Representation Theory, Stony Brook University, August 14–18, 2017.
- Workshop on Algebraic Varieties, Hodge Theory and Motives, Fields Institute, Toronto, March 9–12, 2017.
- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, March 3–5, 2017.
- Joint Mathematics Meetings, Atlanta, January 4–7, 2017.
- Thematic Program on Combinatorial Algebraic Geometry, Workshop on Combinatorial Moduli Spaces and Intersection Theory, Fields Institute, Toronto, December 5–9, 2016.
- AGNES, University of Massachusetts Amherst, Amherst, November 4–6, 2016.
- WAGS, Colorado State University, Fort Collins, October 15–16, 2016.
- Georgia Summer Workshop in Algebraic Geometry, University of Georgia, Athens, August 27–28, 2016.
- Positivity of Cycles, American Institute of Mathematics, San Jose, California, August 1–5, 2016.
- Thematic Program on Combinatorial Algebraic Geometry, Graduate Summer School on Combinatorial Algebraic Geometry, Fields Institute, Toronto, July 18–22, 2016.
- "Giornate di Geometria Algebrica ed Argomenti Correlati XIII", University of Catania, Italy, May 25–28, 2016.

- Spring Southeastern Sectional Meeting, University of Georgia, Athens, March 5–6, 2016.
- Georgia Algebraic Geometry Symposium, Emory University, Atlanta, October 23–25, 2015.
- AGNES, Brown University, Providence, October 2–4, 2015.
- Summer Research Institute on Algebraic Geometry, University of Utah, Salt Lake City, July 13–24, 2015.
- The Graduate Students Bootcamp for the 2015 Algebraic Geometry Summer Research Institute, University of Utah, Salt Lake City, July 6–10, 2015.
- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, October 17–19, 2014.
- Graduate Workshop on Moduli of Curves, Simons Center, Stony Brook University, July 7–18, 2014.
- Georgia Algebraic Geometry Symposium, University of Georgia, Athens, October 18–20, 2013.
- Advanced Course "Compactifying Moduli Spaces", Centre de Recerca Matemàtica, Barcelona, May 27–31, 2013.

Mentoring Experience

- Mentoring Lukas Gustafsson (Sandra Di Rocco's PhD student). KTH, Fall 2020.
- Research Experiences for Undergraduates (REU), University of Massachusetts Amherst, Summer 2018. Student: Patrick Lei.
 - For the background we covered Miles Reid's "*Undergraduate algebraic geometry*".
 - The research project was related to the paper: arXiv:1711.06286

Outreach

- UGA High School Math Tournament, 2016.
 - The day of the tournament I helped with registration, proctoring, and grading.
 - I designed the picture on the tournament T-shirt.
 - I drew most of the pictures for the tournament problems.
 - I helped with writing test problems and solutions.
- UGA High School Math Tournament, 2015. I helped with writing test problems and solutions.

Organizational Experience

- Co-organizer of the conference Algebraic Geometry in Roma Tre, on the occasion of Sandro Verra's 70th birthday, Roma Tre University, June 14–17, 2022.
- Co-organizer of the Geometry Seminar at Roma Tre University (March 2022 – present).
- I organized the poster session for the conference AGNES at the University of Massachusetts Amherst, March 2019.

Committee Work

- Opponent for the master's thesis defense of Michele Matteucci, Roma Tre University, July 6, 2023.
- Member of a hiring committee for a postdoctoral position at KTH, February 2022.

Service

- Jacob–Cohen–Killam competition, University of Massachusetts Amherst, February 2020. I helped with creating some of the problems, writing the solutions, proctoring, and grading.
- Jacob–Cohen–Killam competition, University of Massachusetts Amherst, March 2019. I helped with creating some of the problems and with grading.

Referral and Reviewing

- Referee for AMS Book Program, Proceedings of the International Symposium on Symbolic and Algebraic Computation (ISSAC), Mathematische Zeitschrift, Springer Conference Proceedings, Advances in Mathematics, American Mathematical Monthly, Journal of Symbolic Computation, Experimental Mathematics, and Simons Conference Proceedings.
- Reviewer for *AMS Mathematical Reviews* (2019 – present). 8 papers reviewed: MR3904797, MR3934628, MR4001812, MR4010872, MR4047698, MR4132605, MR4302164, MR4405649.

Programming Languages/Mathematics Software

C, Python/Mathematica, LRS, Macaulay2, SageMath

Languages

- Italian (native language)
- English (fluent, written and spoken)
- Swedish (A1 level)

Place and date:

Rome, 22/08/2023