

Andrea Di Lorenzo

Dipartimento di matematica, largo Bruno Pontecorvo 5
Pisa, Italy
✉ andrea.dilorenzo@unipi.it

Personal information

Date of birth 22 November 1991
Place of birth Rome
Nationality Italian

Present and past positions

2024– now **Tenure-track assistant professor**, *University of Pisa*, Pisa, Italy.
2021– 2024 **Wissenschaftlicher Mitarbeiter**, *Humboldt University*, Berlin, Germany.
Fall 2021 **Junior fellow for the trimester on Moduli spaces and Algebraic Cycles**, *Institute Mittag-Leffler*, Djursholm, Sweden.
2019–2021 **Postdoc**, *Aarhus University*, Aarhus, Denmark.
Spring 2019 **Program associate for the semester on Birational Geometry and Moduli Spaces**, *MSRI*, Berkeley, CA.

Education

2015–2019 **Ph.D. in Mathematics**, *Scuola Normale Superiore*, Thesis title: “Integral Chow ring and cohomological invariants of stacks of hyperelliptic curves”. Advisor: Angelo Vistoli, *cum laude*.
2013–2015 **Master degree in Mathematics**, *Sapienza University of Rome*, Thesis title: “The Schottky problem and minimal cohomology classes”. Advisor: Enrico Arbarello, 110/110 *cum laude*.
2010–2013 **Bachelor degree in Mathematics**, *Sapienza University of Rome*, Thesis title: “The geometry of the moment map”. Advisor: Paolo Piazza, 110/110 *cum laude*.
2005–2010 **High school diploma**, *Liceo classico “Orazio”*, Rome, 100/100 *cum laude*.

Long term visits

Dec. 2019 **Research guest** (invited by A. Kresch), *University of Zürich*, Zürich.
Spring 2017 **Ph.D. visiting student** (invited by A.J. de Jong), *Columbia University*, New York.

Short term visits

- Apr 2022 University of Washington, *Seattle*.
Feb 2020 Scuola Normale Superiore, *Pisa*.
Nov 2019 KTH, *Stockholm*.
Aug 2019 Scuola Normale Superiore, *Pisa*.

Research interests

Moduli of curves, K3 surfaces, Weierstrass fibrations, stable maps.
Picard groups, integral Chow rings, equivariant intersection theory.
Cohomological invariants (a.k.a. unramified cohomology) and Brauer groups.
Quadratic intersection theory and Chow-Witt groups.
Logarithmic geometry, compactification of Prym varieties.

Publications

Effective morphisms and quotient stacks, *joint with Giovanni Inchiostro*, International Mathematics Research Notices, *available online at* <https://doi.org/10.1093/imrn/rnae010> (2024).

Integral Picard group of moduli of polarized K3 surfaces, *joint with Roberto Fringuelli and Angelo Vistoli*, Bull. London Math. Soc., 56 (2024), pp. 833-846.

The integral Chow rings of moduli of Weierstrass fibrations, *joint with Samir Canning and Giovanni Inchiostro*, Transactions of the American Mathematical Society, *available online at* <https://doi.org/10.1090/tran/9084> (2024).

Stable cuspidal curves and the integral Chow ring of $\overline{\mathcal{M}}_{2,1}$, *joint with Michele Pernice and Angelo Vistoli*, *to appear on* Geometry & Topology.

Equivariant Chow-Witt groups and moduli stacks of elliptic curves, *joint with Lorenzo Mantovani*, Documenta Mathematica, 28 (2023), no. 2, pp. 315–368.

Intersection theory on moduli of smooth complete intersections, Mathematische Zeitschrift, 2023, 304(3), pp.1-39.

Cohomological invariants of root stacks and admissible double coverings, *joint with Roberto Pirisi*, Canadian Journal of Mathematics, 2023, 75(1), pp. 202–224.

Integral Chow ring of the stack of smooth non-hyperelliptic curves of genus three, *joint with Damiano Fulghesu and Angelo Vistoli*, Transactions of the American Mathematical Society, 2021, 374(8), pp. 5583–5622.

Brauer groups of moduli of hyperelliptic curves via cohomological invariants, *joint with Roberto Pirisi*, Forum of Mathematics, Sigma, 2021, 9, pp. 2259–2333.

A complete description of cohomological invariants of even genus hyperelliptic curves, *joint with Roberto Pirisi*, Documenta Mathematica, 2021, 26, pp. 199–230.

Picard group of moduli of curves of low genus in positive characteristic, Manuscripta Mathematica, 2021, 165(3-4), pp. 339–361.

Cohomological invariants of the stack of hyperelliptic curves of odd genus, Transformation Groups, 2021, 26(1), pp. 165–214.

The Chow ring of the stack of hyperelliptic curves of odd genus, International Mathematics Research Notices, 2021, 2021(4), pp. 2642–2681.

On quantum and relativistic analogues in Mean-Field Spin models, *with A. Barra, F. Guerra, A. Moro*, Proc. Royal Soc. A, 2014, 470(2172), 20140589.

Preprints

Wall-crossing integral Chow rings of $\overline{\mathcal{M}}_{1,n}$, *joint with Luca Battistella*, *arXiv:2402.14644*, 2024.

The Brauer groups of moduli of genus three curves and plane curves, *joint with Roberto Pirisi*, *arXiv:2402.06620*, 2024.

A criterion for smooth weighted blow-downs, *joint with Veronica Arena, Giovanni Inchiostro, Siddharth Mathur, Stephen Obinna, Michele Pernice*, *arXiv:2310.15076*, 2023.

Degenerations of twisted maps to algebraic stacks, *joint with Giovanni Inchiostro*, *arXiv:2210.03806*, 2022.

Cohomological invariants and Brauer groups of algebraic stacks in positive characteristic, *joint with Roberto Pirisi*, *arXiv:2207.08792*, 2022.

Polarized twisted conics and moduli of stable curves of genus two, *joint with Angelo Vistoli*, *arXiv:2103.13204*, 2021.

Integral Picard group of some stacks of polarized K3 surfaces of low degree, *arXiv:1910.08758*, 2019.

Conference talks

Elliptic curves (minicourse), *Eastern Africa Algebraic Research Group Workshop, Makerere University, Kampala, Uganda*, August 2023.

Introduction to equivariant intersection theory (minicourse), *AGNES Summer School, Brown University, Providence (RI)*, July 2023.

Degenerations of twisted maps to algebraic stacks, *Moduli and algebraic cycles, Institute Mittag-Leffler, Djursholm*, June 2023.

Invariants of moduli stacks, *DMV annual meeting 2022, Berlin*, September 2022.

Quadratic invariants of moduli of elliptic curves, *Invariants in Algebraic Geometry, Dijon*, May 2022.

Intersection theory with quadratic forms and moduli of elliptic curves, *Giornate di Geometria Algebraica e Argomenti Correlati XV, Gargnano*, June 2021.

The integral Chow ring of the stack of hyperelliptic curves of odd genus, *GAeL XXVI, Strasbourg*, June 2018.

Seminar talks

The importance of being a weighted blow-up, *University of Roma 2*, 12 March 2024.

Log Prym varieties, *Scuola Normale Superiore, Pisa*, 8 March 2023.

Degenerations of twisted maps to algebraic stacks, *Humboldt University, Berlin*, 26 October 2022.

Brauer groups of moduli of hyperelliptic curves and their compactifications, *University of Washington, Seattle*, 5 April 2022.

Quadratic invariants of moduli of elliptic curves, *University of Bologna*, 18 March 2022.

The integral Chow ring of the stack of stable 1-pointed curves of genus two, *University of Roma 3*, 10 March 2022.

Quadratic invariants of moduli of elliptic curves, *University of Pisa*, 2 March 2022.

Integral Chow ring of moduli of stable 1-pointed curves of genus two, *University of Bordeaux*, 28 January 2022.

Brauer groups of moduli of hyperelliptic curves and their compactifications, *University of Amsterdam*, 8 December 2021.

The integral Chow ring of the stack of stable 1-pointed curves of genus two, *Institute Mittag-Leffler*, 14 September 2021.

The integral Chow ring of the stack of stable 1-pointed curves of genus two, *Humboldt University, Berlin*, 9 June 2021.

Mixed Tate motives and Brown's theorem, *STAGOSAUR online seminar*, 7 August 2020.

The Chow ring of the stack of stable curves of genus 2, *KTH, Stockholm*, 30 October 2019.

Picard group of moduli of curves and K3 surfaces, *Aarhus University*, 9 October 2019.

Picard group of moduli of curves and K3 surfaces, *University of Ferrara*, 4 October 2019.

The integral Chow ring of stacks of hyperelliptic curves, *MSRI, Berkeley*, 28 February 2019.

The integral Chow ring of moduli stacks of curves, *MAGIC seminar, Imperial College, London*, 28 January 2019.

Services

-Referee for Algebra & Number Theory, Algebraic Geometry, Annali della Scuola Normale Superiore di Pisa, Crelle, EpiGA, European Journal of Mathematics, International Mathematics Research Notices, Manuscripta Mathematica, Mathematische Zeitschrift.

-Advisor for the bachelor thesis of Daniel Acker .

-Zweitgutachter (second advisor) for the bachelor thesis of Max Urlings (April 2022).

Teaching

Spring 2024 **General mathematics**, University of Pisa.

Spring 2024 **Geometry**, University of Pisa.

Fall 2023 **Linear Algebra (TA)**, Humboldt University.

Spring 2023 **Algebraic geometry (TA)**, Humboldt University.

Fall 2022 **Analysis III (TA)**, Humboldt University.

Fall 2022 **Linear Algebra (TA)**, Humboldt University.

Spring 2022 **Number theory**, Humboldt University.

Fall 2021 **Algebraic curves (TA)**, Humboldt University.

Fall 2021 **Algebra II (TA)**, Humboldt University.

Spring 2021 **Geometric group theory (TA)**, Humboldt University.

Fall 2020 **Topology of algebraic varieties**, Aarhus University.

Fall 2019 **Cohomological field theories**, Aarhus University.

Other activities

Co-organizer of the lecture course on "Derived algebraic geometry" at Scuola Normale Superiore, Pisa (8 lectures given), *Oct 2017-Jun 2018*.

Co-organizer of the lecture course on "Derived categories, Fourier-Mukai transform and Bridgeland stability" at Scuola Normale Superiore, Pisa (8 lectures given), *Oct 2016-Jun 2017*.

Outreach activities

"University orientation courses" for high school students, organized by Scuola Normale Superiore, *San Gimignano (2016), Roma (2017), Napoli (2018)*.

Tutor for scientific subjects

Awards and scholarships

Fall 2021 Junior Fellowship, *Institute Mittag-Leffler*.

June 2021 Oberwolfach Leibniz Graduate Student Grant, *MFO*.

2014-2015 Excellence program in Mathematics, MA, *Sapienza University of Rome*.

2012-2013 Excellence program in Mathematics, BA, *Sapienza University of Rome*.

2010–2013 Merit-based exemption from tuition fees payment

Languages

Italian Mother tongue

English Fluent

French Intermediate

Pisa, March 7, 2024