

Andrea Di Lorenzo

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Personal information

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

Present and past positions

2021– now **Wissenschaftlicher Mitarbeiter**, *Humboldt University*, Berlin, Germany.
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

Sep. 2021 **Junior fellow**, Institute Mittag-Leffler, Stockholm.
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 stacks of curves, K3 surfaces, elliptic surfaces
Integral Chow rings and Picard groups
Equivariant intersection theory
Cohomological invariants and unramified cohomology
Brauer Groups
Chow-Witt groups

Publications and preprints

The integral Chow rings of moduli of Weierstrass fibrations, joint with Samir Canning and Giovanni Inchiostro, *arXiv:2204.05524*, (submitted), 2022.

Intersection theory on moduli of smooth complete intersections, *arXiv:2201.06024*, (submitted), 2022.

Stable cuspidal curves and the integral Chow ring of $\overline{\mathcal{M}}_{2,1}$, joint with Michele Pernice and Angelo Vistoli, *arxiv:2108.03680*, (submitted), 2021.

Equivariant Chow-Witt groups and moduli stacks of elliptic curves, joint with Lorenzo Mantovani, *arxiv:2107.02305*, (submitted), 2021.

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

Cohomological invariants of root stacks and admissible double coverings, joint with Roberto Pirisi, *Canadian Journal of Mathematics*, <https://doi.org/10.4153/S0008414X21000602>, 2021.

Integral Chow ring of the stack of smooth non-hyperelliptic curves of genus three, joint with Damiano Fulghesu and Angelo Vistoli, *Transactions of the AMS*, <https://doi.org/10.1090/tran/8354>, 2020.

Brauer groups of moduli of hyperelliptic curves via cohomological invariants, joint with Roberto Pirisi, *Forum of Mathematics, Sigma*, <https://doi.org/10.1017/fms.2021.55>, 2021.

A complete description of cohomological invariants of even genus hyperelliptic curves, joint with Roberto Pirisi, *Documenta Mathematica*, <https://doi.org/10.25537/dm.2021v26.199-230>, 2021.

Integral Picard group of the stack of quasi-polarized K3 surfaces of low degree, *arXiv:1910.08758*, (submitted), 2019.

Picard group of moduli of curves of low genus in positive characteristic, *Manuscripta Mathematica*, <https://doi.org/10.1007/s00229-020-01212-3>, 2020.

Cohomological invariants of the stack of hyperelliptic curves of odd genus, *Transformation Groups*, <https://doi.org/10.1007/s00031-020-09598-w>, 2019.

The Chow ring of the stack of hyperelliptic curves of odd genus, *International Mathematics Research Notices*, <https://doi.org/10.1093/imrn/rnz101>, 2020.

On quantum and relativistic analogues in Mean-Field Spin models, *Proc. Royal Soc. A*, **470**:20140589, with A. Barra, F. Guerra, A. Moro, 2015.

Conference talks

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

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

Intersection theory with quadratic forms and moduli of elliptic curves, *Giornate di Geometria Algebrica 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

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.

Conferences and workshops attended

- Oct. 2021 **Motives and Hodge theory**, *Institute Mittag-Leffler*, Djursholm.
- June 2021 **Classical Algebraic Geometry**, *MFO*, Oberwolfach.
- May 2019 **Recent Progress in Moduli Theory**, *MSRI*, Berkeley, CA.
- Mar. 2019 **Derived algebraic geometry and its applications**, *MSRI*, Berkeley, CA.
- Sept. 2018 **CATS5**, *University of Lisbon*, Lisbon.
- July 2018 **The arithmetic of derived categories**, *University of Trento*, Trento, (presented the poster "*The Chow ring and cohomological invariants of moduli stack of hyperelliptic curves of odd genus*").
- June 2018 **GAeL XXVI**, *University of Strasbourg*, Strasbourg.
- June 2018 **A tale of Algebra and Geometry-a conference to celebrate Angelo Vistoli's 60th birthday**, *University of Pisa*, Pisa.
- March 2018 **School on birational geometry of hypersurfaces**, *Palazzo Feltrinelli, Gargnano sul Garda*, (presented the poster "*The Chow ring and cohomological invariants of moduli stack of hyperelliptic curves of odd genus*").
- Sept. 2017 **Modern Moduli Theory 2017**, *University of Oxford*, Oxford.
- Sept. 2017 **Vector Bundles on Algebraic Curves 2017**, *University of Duisburg-Essen*, Essen.
- July 2017 **School on Deformation Theory**, *Università di Torino*, Torino.
- June 2017 **GAeL XXV**, *University of Bath*, Bath.

- June 2017 **Derived algebraic geometry and interactions**, *Université Toulouse III-Paul Sabatier*, Toulouse.
- Sept. 2016 **School on Higgs bundles and fundamental groups of algebraic varieties**, *University of Duisburg-Essen*, Essen.
- Jan. 2016 **Torsors in algebraic and arithmetic geometry**, *University of Nice-Sophia Antipolis*, Nice.

Services

Referee for Algebraic Geometry, *Annali della Scuola Normale Superiore di Pisa*, *Crelle*, *International Mathematics Research Notices*, *Mathematische Zeitschrift*.

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

Teaching

- 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

Computer skills

Operating systems Unix, Windows
Programming languages Mathematica, SageMath

Languages

Italian Mother tongue
English Fluent
French Intermediate

Berlin, April 20, 2022