

Luigi Lombardi

Curriculum Vitae

University of Milan
Department of Mathematics
Via Cesare Saldini 50, Milan 20133

Phone: +39 02 503 16178
E-mail: luigi.lombardi@unimi.it

Current Appointment

2019 - *Tenure-Track Assistant Professor* (Ricercatore a Tempo Determinato di Tipo B), University of Milan
Rita Levi Montalcini Fellow

Education

2008 - 2013 **University of Illinois at Chicago – Ph.D. in Mathematics**
Advisor: Professor Mihnea Popa

2006 - 2008 **University of Rome “Tor Vergata” – Ph.D. student**

2004 - 2006 **University of Rome “La Sapienza” – Master of Science in Pure Mathematics**

2001 - 2004 **University of Rome “La Sapienza” – Bachelor of Science in Pure Mathematics**

Previous Academic Appointments

2018- 2019 *Post-Doctoral Fellow*, University of Florence

09/2018 *Visiting Researcher*, Max Planck Institute for Mathematics in Bonn

2015 - 2018 *James H. Simons Instructor*, Stony Brook University

2013 - 2015 *Post-Doctoral Fellow*, Mathematical Institute of the University of Bonn

2008-2013 *Research and Teaching Assistant*, University of Illinois at Chicago

Research interests

Birational geometry, minimal model program, Hodge theory, generic vanishing theory, derived categories of sheaves

Publications

- 1) Katrina Honigs, Luigi Lombardi and Sofia Tirabassi. Derived equivalences of canonical covers of hyperelliptic and Enriques surfaces in positive characteristic. To appear in **Mathematische Zeitschrift**
- 2) Luigi Lombardi, Mihnea Popa and Christian Schnell. Pushforwards of pluricanonical bundles under morphisms to abelian varieties. Accepted for publication in **Journal of the European Mathematical Society** (2018).
Web: <http://www.ems-ph.org/journals/forthcoming.php?jrn=jems>
- 3) Luigi Lombardi and Wenbo Niu. Theta-regularity of curves and Brill–Noether loci. **Mathematical Research Letters** 23 (2016), no. 6, 1761–1787
- 4) Marian Aprodu and Luigi Lombardi. On the vanishing of weight one Koszul cohomology of abelian varieties. **Bulletin of the London Mathematical Society** 48 (2016), no. 2, 280–290
- 5) Luigi Lombardi and Sofia Tirabassi. Deformations of minimal cohomology classes on abelian varieties. **Communications in Contemporary Mathematics** 18 (2016), no. 4
- 6) Luigi Lombardi and Sofia Tirabassi. GV -subschemes and their embeddings in principally polarized abelian varieties. **Mathematische Nachrichten** 288 (2015), no. 11–12, 1405–1412
- 7) Luigi Lombardi and Mihnea Popa. Derived equivalence and non-vanishing loci II. **London Mathematical Society, Lecture Note Series** 417 (2015), Recent Advances in Algebraic Geometry: volume in honor of R. Lazarsfeld, Cambridge University Press 2015, 291–306
- 8) Luigi Lombardi. Derived invariants of irregular varieties and Hochschild homology. **Algebra and Number Theory** 8 (2014), no. 3, 513–542
- 9) Luigi Lombardi. Inequalities for the Hodge numbers of irregular compact Kähler manifolds. **International Mathematics Research Notices** (2013), no. 1, 63–83
- 10) Luigi Lombardi and Francesco Malaspina. The equations of singular loci of ample divisors on (subvarieties of) abelian varieties. **Le Matematiche** LXIII (2008), no. I, 155–166
- 11) Luigi Lombardi. Derived equivalences of irregular varieties and constraints on Hodge numbers. **Ph.D. Thesis** - University of Illinois at Chicago. 2013.

Preprints

- 1) Luca Di Cerbo and Luigi Lombardi. Moving Seshadri constants, and coverings of varieties of maximal Albanese dimension. Submitted. Preprint: arXiv:1902.04098

- 2) Luigi Lombardi. Derived equivalence and fibrations over curves and surfaces. Submitted. Preprint arXiv:1803.08656
- 3) Luca Di Cerbo and Luigi Lombardi. L^2 -Betti Numbers and Convergence of Normalized Hodge Numbers via the Weak Generic Nakano Vanishing Theorem. Submitted. Preprint arXiv:1906.06279

Participation to research projects

- 2018 - 2019 “Analytic aspects in complex and hypercomplex geometry,” Italian Research Foundation.
- 2017 - 2020 “The arithmetic of derived categories,” Research Council of Norway.
- 2015 - 2018 *Sonderforschungsbereich/Transregio 45 Mainz-Bonn-Essen: “Periods, moduli spaces and arithmetic of algebraic varieties”*

Awards and fellowships

- 2019 - 2022 “Rita Levi Montalcini Program,” Italian Ministry of Research and Education (MIUR)
- 2018 - 2024 Italian National Habilitation to fulfill the role of Associate Professor in Geometry and Algebra
- 2018 - 2019 Visiting grant, Max Planck Institute for Mathematics in Bonn
- 2015 - 2018 Research grant “*Simons Foundation*”
- 2011 - 2012 “Dean’s Scholar Award,” University of Illinois at Chicago
- 2010 - 2012 Research Assistantships, University of Illinois at Chicago (Fall 2010, Fall and Summer 2012)
- 2011 Travel award, American Mathematical Society, Mathematical Research Communities

Academic visits

- Fudan University, Shanghai Center for Mathematical Sciences. Invited by Prof. Zhi Jiang (21/08/2019 - 02/09/2019)
- Leibniz University in Hannover. Invited by Prof. Victor Gonzalez-Alonso (13/5/2019 - 17/5/2019)
- University of Florida. Invited by Prof. Luca Di Cerbo (5/11/2018 - 11/11/2018)
- University of Essen. Invited by Prof. Daniel Greb (10/7/2017 - 14/7/2017)
- University of Freiburg. Invited by Prof. Stefan Kebekus (18/6/2017 - 9/7/2017)
- University of Bonn. Invited by Prof. Daniel Huybrechts (5/6/2017 - 15/6/2017)
- University of Rome “Tor Vergata.” Invited by Prof. Giuseppe Pareschi (22/5/2017 - 2/6/2017)
- University of Turin. Invited by Prof. Alberto Collino (10/1/2017 - 13/1/2017)

- Mathematical Institute of the Romanian Academy “Simion Stoilow.” Invited by Prof. Marian Aprodu (7/6/2015 - 15/6/2015)
- Institute of Pure and Applied Mathematics in Rio de Janeiro. *Thematic trimester in Algebraic Geometry* (15/5/2015 - 30/5/2015)

Teaching

Instructor, University of Milan

- *Istituzioni di Matematica* (24 hours), Fall 2019
- *Geometria 1* (40 hours), Spring 2020
- *PhD Course: Kähler geometry and Hodge Theory* (10 hours), Spring 2019

Instructor, University of Florence

- *PhD Course: Cones of Divisors and Positivity* (15 hours), Spring 2019

Instructor, Stony Brook University

- *Calculus III: Multivariable Functions*, Spring 2018
- *Introduction to Linear Algebra*, Fall 2016, Spring 2017, Fall 2017
- *Calculus I*, Fall 2016
- *Calculus IV: Differential Equations*, Spring 2015

Teaching Assistant, Stony Brook University

- *Calculus III: multivariable functions*, Spring 2018
- *Calculus II*, Fall 2015

Organizer and speaker, University of Bonn

- *Graduate Student Seminar: Derived Categories in Algebraic Geometry*, Winter 2014

Teaching Assistant, University of Illinois at Chicago

- *Intermediate Algebra*, Fall 2008, Spring 2009, Summer 2009
- *Precalculus*, Summer 2010
- *Finite Mathematics for Business*, Fall 2009
- *Quantitative Reasoning*, Spring 2011
- *Calculus for Business*, Spring 2010, Summer 2011
- *Calculus I*, Spring 2013, Summer 2013

Conferences and colloquia

Banff International Research Station, “Interactions between Brauer Groups, Derived Categories, and Birational Geometry of Projective Varieties.” Seminar: Derived invariants of irregular varieties (10/11/2019 - 15/11/2019)

University of Arkansas, “Advances in Birational Geometry,” American Mathematical Society Fall Southeastern sectional meeting. Seminar: *Derived equivalence of varieties and fibrations over curves and surfaces* (3/11/2018)

University of Freiburg, Research Focus “Cohomology in Algebraic Geometry and Representation Theory.” Seminar: *A decomposition theorem for the pushforwards of pluricanonical bundles under morphisms to abelian varieties* (18/6/2018 - 9/7/2017)

Queensborough College of New York, Departmental Colloquium. Seminar: *Generic Vanishing Phenomena* (19/4/2017)

University of Padua, Workshop “Recent advances in linear series and Newton–Okounkov bodies.” Seminar: *Generic vanishing theory and equivalences of irregular varieties* (9/2/2015 - 13/2/2015)

University of Bonn, Conference for young researchers in Arithmetic and Algebraic Geometry. Seminar: *Deformations of minimal cohomology classes and regularity* (6/10/2014 - 8/10/2014)

Hausdorff Research Institute of Mathematics in Bonn, “Workshop on Derived Categories.” Seminar: *Derived equivalences of irregular varieties and non-vanishing loci* (10/2/2014 - 13/2/2014)

University of Milan, “Workshop of Algebraic geometry.” Seminar: *Deformations of minimal cohomology classes and regularity* (15/12/2014 - 16/12/2014)

Turin, Conference “Days of Algebraic Geometry and Related Subjects XII.” Seminar: *Equivalenze derivate di varietà irregolari e luoghi di non annullamento* (4/6/2014 - 7/6/2014)

University of Wisconsin in Madison, Midwest Algebraic Geometry Graduate Conference. Seminar: *Derived equivalences of irregular varieties and Hochschild homology* (3/11/2012 - 4/11/2012)

Seminar talks

2019 **Leibniz University in Hannover**, Algebraic Geometry Seminar, *Positivity of direct images of pluricanonical bundles under morphisms to abelian varieties*

University of Milan, Algebraic Geometry Seminar, *Positivity of direct images of pluricanonical bundles under morphisms to abelian varieties*

2018 **University of Florence**, Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*

University of Florida, Geometry Seminar, *Asymptotic growth of cohomology ranks and vanishing of L^2 -Betti numbers*

- 2017 **John Hopkins University**, Algebraic Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- University of Rome “Tor Vergata,”** Algebraic Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- University of Washington in Seattle**, Algebra and Algebraic Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- University of Arkansas**, Algebra Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- Stony Brook University**, Algebraic Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- University of Turin**, Algebraic Geometry Seminar, *A decomposition theorem for the direct images of pluricanonical bundles under morphisms to abelian varieties*
- 2016 **Stony Brook University**, Post-Docs Seminar, *Introduction to derived categories*
- Stony Brook University**, First and second year student seminar, *How to write a CV*
- 2015 **Stony Brook University**, Algebraic Geometry Seminar, *Derived equivalences of irregular varieties and non-vanishing loci*
- Mathematical Institute of the Romanian Academy “Simion Stoilow,”** Algebraic Geometry Seminar, *Derived equivalences of irregular varieties and non-vanishing loci*
- University of Poitiers**, Algebraic Geometry Seminar, *Deformations of minimal cohomology classes and regularity*
- University of Copenhagen**, Algebraic Geometry Seminar, *Deformations of minimal cohomology classes and regularity*
- 2014 **University of Bonn**, SFB-TR45 Seminar, *How to use Nagata’s conjecture*
- 2013 **University of Bonn**, SFB-TR45 Seminar, *Derived equivalences of irregular varieties I, II*
- University of Notre Dame**, Algebraic Geometry Seminar, *Comparison of non-vanishing loci under derived equivalence*
- 2012 **University of Michigan**, Algebraic Geometry Seminar, *Derived equivalences of irregular varieties and Hochschild homology*
- University of Utah**, Algebraic Geometry Seminar, *Derived equivalences of irregular varieties*
- University of Purdue**, Algebraic Geometry Seminar, *Derived equivalences of irregular varieties*
- University of Illinois at Chicago**, Student Colloquium, *Derived invariants of smooth projective varieties*
- University of Illinois at Chicago**, Algebraic Geometry Seminar, *Derived equivalences of irregular varieties and Hochschild homology*

University of Illinois at Chicago, Algebraic Geometry Seminar, *Inequalities for the Hodge numbers of irregular varieties*

2008 - 2013 **University of Illinois at Chicago**, Algebraic Geometry Student Seminar

Recent conferences and schools

- 2019 *Classical Algebraic Geometry in Milano (in honor of Antonio Lanteri on the occasion of his 70th birthday)*, 8-11/7/2019, University of Milan
Workshop on Derived Categories, Moduli Spaces and Deformation Theory, Cetraro
One day of Algebraic Geometry, University of Milan
Hodge ideals and mixed Hodge modules, University of Angers
- 2018 *Advances in birational geometry*, American Mathematical Society, University of Arkansas
Mixed Hodge modules in birational geometry, Johannes Gutenberg University Mainz
Topological data analysis and persistent homology, Levico Terme
Shimura varieties and hyperbolicity of moduli spaces, UQAM, Montreal
- 2017 *Hodge theory, moduli, and representation theory*, Simons Center for Geometry and Physics
Algebraic Geometry Northeastern Series, Stony Brook University
Singular metrics and direct images, Sixth minischool in Geometry, Stony Brook University
- 2016 *Algebraic Geometry Northeastern Series*, Amhrest College
Thematic Semester in Hodge Theory, Simons Center for Geometry and Physics
Derived categories and Chow groups of hyperkähler and Calabi–Yau varieties, Simons Center for Geometry and Physics
Workshop on Higher Codimension Cycles on Algebraic Varieties, University of Illinois at Chicago
Summer school “Stability conditions on triangulated categories and geometric applications,” Conference Center Sophus Lie

Synergistic activities

Referee for Transactions of the American Mathematical Society;
London Mathematical Society Lecture Note Series;
Bulletin of the London Mathematical Society;
Proceedings of the American Mathematical Society;
Journal of Algebra

Co-organizer of the “School on Langlands correspondence,” Centro De Giorgi, Pisa, 15/06/2019 - 19/06/2019

Co-organizer of the “Cremona transformations and the Sarkisov Program,” University of Ferrara, 14/01/2020

Co-organizer of the “Workshop on Fano varieties,” University of Udine, 25/09/2019

Organizer of the “First and second year student seminar,” Stony Brook University, Fall 2016 and Spring 2017

Teaching Mentor, University of Illinois at Chicago, Summer 2013

Mentor, “Ph.D. student colloquium,” University of Illinois at Chicago, Fall 2012

Organizer of the “Algebraic Geometry Student Seminar,” University of Illinois at Chicago, Spring 2010 and Summer 2011

Languages

Italian, mother tongue

English, fluent

German, basic level