Emanuele Macrì

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Academic Education

Ph.D. in Mathematics, SISSA, Trieste, 2006

Laurea in Matematica, Università di Genova, 2002

Appointments

Professor, Université Paris-Saclay, 2019–

Associate Professor, Northeastern University, 2015–2019

Assistant Professor, The Ohio State University, 2011–2014

Bonn Junior Fellow, W2 level, Universität Bonn, 2010–2011

Wylie Assistant Professor, University of Utah, 2008–2010

Postdoc, Hausdorff Center for Mathematics, Bonn, 2007–2008

Postdoc, Max-Planck-Institute für Mathematik, Bonn, 2006–2007

Awards, Honors, and Financial Support

Invited speaker, International Congress of Mathematicians 2022

Séminaire Bourbaki talk by F. Charles, 2018
Conditions de stabilité et géométrie birationnelle [d'après Bridgeland, Bayer-Macrì,...]

Poincaré Chair, Institut Henri Poincaré and Clay Mathematics Institute, 2017

ERC Synergy Grant 854361 "HyperK"
(PI, €1,764,593 at Paris-Saclay, €8,529,641 in total, 2020–2026)

NSF Grants DMS-1001482, DMS-1302730, DMS-1700751
(PI, standard grant, $120,674, $163,000, $155,000, 2010–2019)

NSF Grant DMS-1664215
(PI, FRG grant, $154,000, 2017–2019)

NSF Grant DMS-1645877
(PI, RTG grant, $2,242,000, 2017–2022)

College of Engineering Outstanding Teacher of First Year Engineering Students Award, 2016

Outstanding Instructor Award, University of Utah, 2010

Publications

Refereed Articles in Journals:

1. A. Bayer, M. Lahoz, E. Macrì, H. Nuer, A. Perry, P. Stellari: *Stability conditions in families*, to appear in Publ. Math. IHÉS (2021).

2. E. Macrì, B. Schmidt: *Stability and applications*, Pure Appl. Math. Q. **17** (2021), 671–702 (special issue in honor of David Mumford).

3. E. Macrì, B. Schmidt: *Derived categories and the genus of space curves*, Algebraic Geometry **7** (2020), 153–191.

4. O. Debarre, E. Macrì: *On the period map for hyperkähler fourfolds*, Int. Math. Res. Not. IMRN (2018), Article ID rnx333, 37 pp.

5. A. Bayer, M. Lahoz, E. Macrì, P. Stellari: *Stability conditions on Kuznetsov components*, to appear in Ann. Sci. Éc. Norm. Supér. (2023).

6. M. Lahoz, M. Lehn, E. Macrì, P. Stellari: *Generalized twisted cubics on cubic fourfolds as a moduli space of stable objects*, J. Math. Pures Appl. **114** (2018), 85–117.

7. M. Bernardara, E. Macrì, B. Schmidt, X. Zhao: *Bridgeland stability conditions on Fano threefolds*, Épijournal de Géométrie Algébrique **1** (2017), Article Nr. 2.

8. A. Bayer, E. Macrì, and P. Stellari: *The space of stability conditions on abelian threefolds, and on some Calabi-Yau threefolds*, Invent. Math. **206**, 869–933 (2016).

9. M. Lahoz, E. Macrì, and P. Stellari: *ACM bundles on cubic threefolds*, Algebraic Geometry **2**, 231–269 (2015).

10. A. Bayer and E. Macrì: *MMP for moduli of sheaves on K3s via wall-crossing: nef and movable cones, Lagrangian fibrations*, Invent. Math. **198**, 505–590 (2014).

11. A. Bayer and E. Macrì: *Projectivity and birational geometry of Bridgeland moduli spaces*, J. Amer. Math. Soc. **27**, 707–752 (2014).

12. E. Macrì: *A generalized Bogomolov-Gieseker inequality for the three-dimensional projective space*, Algebra Number Theory **8**, 173–190 (2014).

13. A. Bayer, A. Bertram, E. Macrì, and Y. Toda: *Bridgeland stability conditions on threefolds II: An application to Fujita's conjecture*, J. Algebraic Geom. **23**, 693–710 (2014).

14. A. Bayer, E. Macrì, and Y. Toda: *Bridgeland stability conditions on threefolds I: Bogomolov-Gieseker type inequalities*, J. Alg. Geom. **23**, 117–163 (2014).

15. E. Macrì and P. Stellari: *Fano varieties of cubic fourfolds containing a plane*, Math. Ann. **354**, 1147–1176 (2012).

16. M. Bernardara, E. Macrì, S. Mehrotra and P. Stellari: *A categorical invariant for cubic threefolds*, Adv. Math. **229**, 770–803 (2012).

17. A. Bayer and E. Macrì: *The space of stability conditions on the local projective plane*, Duke Math. J. **160**, 263–322 (2011).

18. D. Huybrechts, E. Macrì, and P. Stellari: *Formal deformations and their categorical general fibre*, Comment. Math. Helv. **86**, 41–71 (2011).

19. E. Macrì and P. Stellari: *Infinitesimal Derived Torelli Theorem for K3 surfaces* (with an appendix by S. Mehrotra), Int. Math. Res. Not., Article ID rnp049, 31 pp. (2009).

20. D. Huybrechts, E. Macrì, and P. Stellari: *Derived equivalences of K3 surfaces and orientation*, Duke Math. J. **149**, 461–507 (2009).

21. E. Macrì, S. Mehrotra, and P. Stellari: *Inducing stability conditions*, J. Alg. Geom. **18**, 605–649 (2009).

22. E. Macrì, M. Nieper-Wisskirchen, and P. Stellari: *The module structure of Hochschild homology in some examples*, C. R. Math. Acad. Sci. Paris **346**, 863–866 (2008).

23. E. Macrì and P. Stellari: *Automorphisms and autoequivalences of generic analytic K3 surfaces*, J. Geom. Phys. **58**, 133–164 (2008).

24. D. Huybrechts, E. Macrì, and P. Stellari: *Stability conditions for generic K3 categories*, Compositio Math. **144**, 134–162 (2008).

25. E. Macrì: *Stability conditions on curves*, Math. Res. Lett. **14**, 657–672 (2007).

26. C. Bartocci and E. Macrì: *Classification of Poisson surfaces*, Comm. Cont. Math. **7**, 89–95 (2005).

Submitted Papers and Preprints:

27. L. Flapan, E. Macrì, K.G. O'Grady, G. Saccà: The geometry of antisymplectic involutions, I, Preprint 2021, `arXiv:2102.02161`.

28. E. Macrì: *Some examples of spaces of stability conditions on derived categories*, Preprint 2004, `http://arxiv.org/abs/math/0411613`.

Articles in Books:

29. E. Macrì, P. Stellari: *Lectures on non-commutative K3 surfaces, Bridgeland stability, and moduli spaces*, in "Birational geometry of hypersurfaces", 199–265, Lect. Notes Unione Mat. Ital. **26**, Springer 2019.

30. E. Macrì, B. Schmidt: *Lectures on Bridgeland Stability*, in "Moduli of curves", 139–211, Lect. Notes Unione Mat. Ital. **21**, Springer 2017.

31. M. Lahoz, E. Macrì, P. Stellari: *ACM bundles on cubic fourfolds containing a plane*, in "Brauer groups and obstruction problems", 155–175, Progr. Math. **320**, Birkhäuser/Springer 2017.

32. E. Macrì: *Stability conditions for derived categories*, in "Fourier-Mukai and Nahm transforms in geometry and mathematical physics", 359–395, Progr. Math. **276**, Birkhäuser 2009.

Graduate students

Benjamin Schmidt, PhD 2016, The Ohio State University
(currently postdoc at Leibniz Universität Hannover)

Bingyu Xia, PhD 2017, The Ohio State University
(currently postdoc at Morningside Center of Mathematics, Chinese Academy of Sciences)

Yucheng Liu, PhD 2020, Northeastern University
(currently postdoc at Beijing International Center for Mathematical Research)

Benjamin Sung, 2016–, Northeastern University

Céline Bonandrini, 2019–, Université Paris-Saclay

Alessio Bottini, 2019–, Università di Roma, Tor Vegata & Université Paris-Saclay

Luigi Martinelli, 2020–, Université Paris-Saclay

Postdoc Mentoring

Martí Lahoz, 2010–2011, Universität Bonn, with D. Huybrechts
(currently Maître de conférences at Université de Paris)

Davide Fusi, 2013–2014, The Ohio State University
(currently Assistant Professor at the University of South Carolina, Beaufort)

Xiaolei Zhao, 2015–2018, Northeastern University
(currently Assistant Professor at the University of California, Santa Barbara)

Howard Nuer, 2016–2017, Northeastern University
(currently Assistant Professor at Technion, Israel Institute of Technology)

Laure Flapan, 2017–2019, Northeastern University
(currently Assistant Professor at Michigan State University)

Ignacio Barros, 2021–, Université Paris-Saclay

Dmitrii Pirozhkov, 2021–, Université de Paris, with O. Debarre

Teaching Experience

2019–present	Instructor, Université Paris-Sud

– Mathématiques Générales I (M1), Fall 2020
– Algèbre linéaire (Math 153), Spring 2019
– Mathématiques Générales I (M1), Fall 2019
– Algèbre (ENS-Cachan, L3), Fall 2019

2015–2019	Instructor, Northeastern University

– Schemes (Math 7361), Spring 2018
– Introduction to Mathematical Reasoning (Math 1365), Fall 2017
– Schemes (Math 7361), Fall 2016
– Calculus I for Science and Engineering (Math 1341), Fall 2015
– Introduction to Mathematical Reasoning (Math 1365), Fall 2015

2011–2014	Instructor, The Ohio State University

– Topics in Algebraic Geometry (Math 8140), Autumn 2014
– Algebra I (Math 6111), Autumn 2014
– Algebra I (Math 6111), Autumn 2013
– Abstract Algebra II (Math 4581), Spring 2013
– Topics in Algebraic Geometry (Math 8140), Autumn 2012
– Abstract Algebra I (Math 4580), Autumn 2012
– Algebraic Geometry III (Math 842), Spring 2012
– Algebraic Geometry II (Math 841), Winter 2012
– Algebra I (Math 580), Autumn 2011

2010–2011	Instructor, Universität Bonn

– Advanced Topics in Algebra, Spring 2011
– Algebraic Geometry II, Winter 2010

2008–2010	Instructor, University of Utah

– Accelerated Engineering Calculus II (Math 1280), Spring 2010
– PDEs for Engineers (Math 3150), Fall 2009
– Calculus III (Math 2210), Spring 2009
– Calculus III (Math 2210), Fall 2008

Conference Talks and Lecture Series (since 2016)

2022:

1. Rencontre GDR-GAGC, CIRM, Luminy
2. VBAC, in honour of Peter Newstead, Warwick University
3. Integrable systems and geometry of moduli spaces, Yaroslavl, Russia
4. Algebraic Geometry, Steklov Mathematical Institute, Moscow

2021:

5. Geometry and arithmetic of varieties with trivial canonical bundle, University of Oslo
6. Moduli and Algebraic Cycles, Institut Mittag-Leffler, Stockholm
7. Riposte armonie: Algebraic Geometry in Cetraro together with Ciro Ciliberto, Cetraro, Italy
8. BrAG, Imperial College, London
9. Autumn School in Algebraic Geometry, Lukecin, Poland (5 lectures)
10. Moduli Spaces in Algebraic Geometry and Applications, Mathematical Congress of the Americas
11. GAeL XXVIII, Loughborough University (3 lectures)
12. Classical Algebraic Geometry, MFO, Oberwolfach

2020:

13. Derived, Birational, and Categorical Algebraic Geometry, BIRS, Banff
14. Rationality, Simons Foundation: New York City
15. Algebraic Geometry: Moduli spaces, Birational Geometry and Derived Aspects, MFO, Oberwolfach
16. Moduli of Bundles and Related Structures, ICTS, Bengaluru, India
17. Workshop EXARCHOS, Ravenna, Italy

2019:

18. School on Bridgeland stability, University of Warwick
19. Categorical and Analytic Invariants in Algebraic Geometry VII, Osaka University
20. The geometry of algebraic varieties: A conference on the occasion of Olivier Debarre's 60th birthday, CIRM, Luminy
21. Derived Categories and Geometry in Positive Characteristic, Warsaw, Poland
22. Workshop on Derived Categories, Moduli Spaces and Deformation Theory, Cetraro, Italy
23. Moduli in Budapest, Alfréd Rényi Institute of Mathematics, Hungary
24. Jíbiri Seminar II, University of Salamanca
25. Workshop on HMS and Stability, Harvard University
26. Derived Algebraic Geometry and Birational Geometry and Moduli Spaces, MSRI

2018:

27. Quiver Varieties, Moduli Spaces, and Applications to Mathematical Physics, Università di Genova
28. Cohomology of Algebraic Varieties, CIRM, Luminy
29. Moduli spaces and related Problems, Shanghai Center for Mathematical Science
30. From Algebraic Geometry to Vision and AI: A Symposium Celebrating the Mathematical Work of David Mumford, Harvard University
31. Moduli Spaces in Algebraic Geometry and Applications, Campinas, Brazil

32. Two days of Algebraic Geometry, Università di Milano

33. Giornate di Geometria Algebrica ed Argomenti Correlati XIV, Università di Genova

34. A day of Algebraic Geometry in Savannah, Georgia Southern University

35. School on Birational Geometry of Hypersurfaces, Gargnano del Garda, Italy (4 lectures)

36. Korean-Italian Meeting on Algebraic Geometry, KIAS, Seoul

2017:

37. Algebraic Geometry: Birational Classification, Derived Categories, and Moduli Spaces, MFO, Oberwolfach

38. VBAC 2017, University of Essen, (4 lectures)

39. Abel Symposium 2017, Geometry of moduli, Svolvaer, Norway

40. Positivity in Algebraic and Complex Geometry, ICMS, Edinburgh

41. Georgia Algebraic Geometry Symposium, University of Georgia

42. Stability and moduli spaces, AIM, San Jose

2016:

43. Christmas Workshop on Quivers, Moduli Spaces and Integrable Systems, Università di Genova

44. Algebraic geometry: old and new, Clay Mathematics Institute, Oxford

45. Geometry at the ANU, Australian National University (4 lectures)

46. Interacting algebraic geometry, Université de Burgundy

47. New methods in birational geometry, Universitè de Toulouse (4 lectures)

48. Classical Algebraic Geometry, MFO, Oberwolfach

49. CIMPA School Moduli of curves, CIMAT, Guanajuato, Mexico (5 lectures)

Seminar Talks

Invitations at local and online research seminars: **87** (since 2006)

Visiting Positions

Poste Rouge CNRS, Université Paris-Sud, 2019

Institut des Hautes Études Scientifiques, Bures-sur-Yvette, 2018–2019

Visiting Professor, Australian National University, 2016

Visiting Professor, Université de Toulouse, 2016

Visiting Scholar, Universität Bonn, 2014

Visiting Scholar, Universität Bonn, 2012

Visiting Scholar, Universität Bonn, 2009

Visiting Scholar, Universidad de Salamanca, 2008

Institut des Hautes Études Scientifiques, Bures-sur-Yvette, 2007

Visiting Student, University of Pennsylvania, 2005

Service

(Co-)organizer of the following conferences:

- Moduli Spaces and Stability, University of Illinois at Chicago, 2020
- Moduli Spaces of sheaves and Bridgeland Stability, University of Illinois at Chicago, 2018
- Semiorthogonal decompositions, stability conditions and sheaves of categories, Université de Toulouse, 2018
- AMS Sectional Meeting, Geometry of Moduli Spaces, Northeastern University, 2018
- Moduli of Sheaves and Strange Duality, Penn State University, 2017
- AGNES, Northeastern University, 2017
- Positivity in Arithmetic and Geometry, Université Paris-Sud, 2017
- Derived categories and Chow groups of hyperkähler and Calabi-Yau varieties, Simons Center, Stony Brook University, 2016
- Spring School on Compactifying Moduli Spaces, CRM, Barcelona, 2013
- Hodge Theory and Classical Algebraic Geometry, The Ohio State University, 2013
- AMS Sectional Meeting, Geometry of Algebraic Varieties, University of Akron, 2012

(Co-)organizer of the following activities:

- Derived seminar, online, 2021–
- SAGA, Orsay, 2020–
- Geometry, Physics, and Representation Theory Seminar, Northeastern University, 2015–2018
- AGNeUBC, Northeastern University & Boston College, 2015–2017
- Algebraic Geometry Seminar, The Ohio State University, 2013–2014
- Seminar Algebraic Geometry (SAG), Universiät Bonn, 2007, 2010
- Algebraic Geometry Seminar, University of Utah, 2008–2010
- UM/UIC/OSU Weekend Algebraic Geometry Workshop, The Ohio State University, 2012, 2014
- Groupes de travail, Université Paris-Saclay, 2019–
- Graduate seminars, MIT/Northeastern University, 2016
- Reading Seminars in Algebraic Geometry, The Ohio State University, 2011–2014
- Reading Seminar in Algebraic Geometry, University of Utah, 2010
- Baby Algebraic Geometry Seminar, University of Utah, 2009.
- Reading Seminars in Algebraic Geometry, Universität Bonn, 2006–2008

Group supervisor, MRC 2010 Program on Birational geometry and moduli spaces, Snowbird, 2010

Editorial work:

- Editor for Mathematische Zeitschrift, Springer, 2021–
- Proceedings of the Hodge Theory Conference at OSU, AMS, 2015
- Lecture notes for the school Compactifying Moduli Spaces (2 volumes), Birkhäuser, 2016

Ph.D. defense committee member:

- Pietro Beri, Université de Poitiers, 2020 (referee)
- Fatemeh Rezaee, University of Edinburgh, 2020 (referee)
- Laura Pertusi, University of Milano, 2018 (referee)
- Anna Barbieri, University of Pavia, 2017 (referee)
- Barbara Bolognese, Northeastern University, 2016
- Yinbang Lin, Northeastern University, 2016
- Xun Yu, The Ohio State University, 2013
- Heinrich Hartmann, Universität Bonn, 2011 (referee)

Habilitation committee member:

- Frank Gounelas, Humboldt Universität, 2019

Tenure letters: **5**

Oral exam committee member: **12** students

Master thesis defense committee member: **4** students

Course coordinator:

- Algèbre linéaire, Université Paris-Saclay, 2019
- Introduction to Mathematical Reasoning, Northeastern University 2017
- Abstract Algebra, The Ohio State University, 2013–2014

Course development:

- Algebraic Surfaces, The Ohio State University, 2012

Committees:

- Comité de sélection for a Maître de Conférences position, Université Paris-Saclay, 2020
- Faculty Hiring Committee, Northeastern University, 2017–2018
- Postdoc Hiring Committee, Northeastern University, 2015–2017
- Executive Committee, The Ohio State University, 2013–2014
- Undergraduate Committee, The Ohio State University, 2012–2014

Panelist for the National Science Foundation, 2013, 2014, 2017, 2019

External reviewer for the National Security Agency (2011, 2012, 2013, 2015, 2016), Natural Sciences and Engineering Research Council of Canada (2015), INdAM Fellowships in Mathematics and/or Applications (2015), Agence Nationale de la Recherche (2015, 2016), Royal Swedish Academy of Sciences (2019), German Research Foundation DFG (2020), Poland National Science Centre (2020), European Research Council (2020)

Referee for several journals