

Curriculum vitae

Massimo Bertolini

(updated February 2, 2017)

Present position: Full professor (W3), University of Duisburg-Essen

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Past positions:

- Hausdorff Chair, University of Bonn, 2011 (declined)
- Full Professor, University of Milano, 2003-2013.
- Full Professor, University of Padova, 2000-2003
- Associate Professor, University of Pavia, 1999-2000
- Assistant Professor, University of Pavia, 1992-1999

Studies

- 1988-92 Columbia University. PhD.
- 1986-88 Harvard University. Master of Arts.
- 1980-84 Università di Pavia. BS (*cum laude*).

Visiting positions

- Algant visiting scholar, McGill University (Montreal), November 2012.
- Centre de Recerca Matemàtica, Barcelona, Member, October 2009.
- Université de Strasbourg, Professeur Visiteur, March 2003.
- Centre de Recherches Mathématiques, Université de Montreal, Member, September-October 1998.

- Université de Strasbourg, Professeur Visiteur, March-April 1998.
- Centre Emile Borel (Paris), Visiteur, May-June 1997.
- Institute for Advanced Study (Princeton), Member, II semester 1996.

Academic highlights

- Editor of Bollettino dell'Unione Matematica Italiana, 2013–
- Socio Corrispondente non residente, Istituto Veneto di Scienze Lettere ed Arti, elected in 2009
- Member of the Scientific Advisory Board (Fachbeirat), Max Planck Institute for Mathematics in Bonn, 2007-2012
- Socio Corrispondente, Istituto Lombardo Accademia di Scienze e Lettere, elected in 2005
- President of the Steering Committee, Department of Mathematics, University of Milano, 2004-2008
- Central coordinator of the European Marie-Curie RTN Network “Arithmetic Algebraic Geometry”, 2004-2008
- Editor of Rendiconti del Seminario Matematico dell'Università di Padova, 2002-2012
- Galafassi Prize, 1987
- Cinquini Prize, 1983

SCIENTIFIC ACTIVITY

I. Scientific responsibilities.

- Principal investigator, DFG Collaborative Research Center 45 “Periods, Moduli Spaces, and Arithmetic of Algebraic Varieties”, involving the Universities of Duisburg–Essen, Bonn and Mainz.
- Local coordinator of the Milano group in the MIUR Prin-project “Arithmetic Geometry and Number Theory”, 2011-2013.
- Member of the Scientific Advisory Board (Fachbeirat), Max Planck Institute for Mathematics in Bonn, 2007-2012.

- Central coordinator of the European Marie Curie RTN network "Arithmetic Algebraic Geometry", for the period 2004-2008. The network included 14 nodes: Milano, Padova, Paris-Sud (Orsay), Parigi-Nord, Rennes, Strasbourg, Max Planck Institut für Mathematik in Bonn, Muenster, Regensburg, Cambridge, Durham, Barcelona, Jerusalem, Tokyo.
- Local coordinator of the Pavia group in the MURST project "Geometria Algebrica, Algebra Commutativa e Aspetti Computazionali" , 1998-2000.

II. Organisation of scientific activities

- Member of the scientific committee (with R. Dvornicich, A. Perelli, C. Viola, U. Zannier) of the conference "Terzo incontro italiano di Teoria dei Numeri", Centro Ennio De Giorgi, Pisa, September 2015.
- Member of the scientific committee (with M. Rasetti, S. Salamon, G. Tomassini, U. Zannier) of the course "Advances in Number Theory and Riemannian Geometry" (director E. Bombieri), April 16-22, 2009, of the "Riemann International School of Mathematics".
- Member of the scientific committee (with S. Bosch, B. Chiarellotto, M. Rapoport, A. Scholl) of the "Arithmetic Algebraic Geometry Conference", Cetraro (Italy), October 7-13, 2007.
- Member of the scientific committee (with J. Cremona, B. Edixhoven, J. von zur Gathen, B. Green, A. Lauder, J. Nekovar, E. Peyre, G. Tenenbaum, P. Tretkoff, U. Zannier) of the XXV Journées Arithmétiques, July 2-6 2007, Edinburgh (UK).
- Member of the scientific committee (with J-M. Fontaine, J. Nekovar, P. Schneider, X. Xarles) of the "International Conference in Arithmetic Algebraic Geometry" (satellite of the International Congress of Mathematicians 2006), El Escorial, Madrid (Spain), September 3-9, 2006.
- Member of the scientific committee (with P. Berthelot, G. Harder, A. Quiros, E. deShalit, N. Schappacher) of the "International Conference in Arithmetic Algebraic Geometry", Bonn (Germany), September 15-19, 2003.
- Organizer (with A. Adolphson, F. Baldassarri, S. Sperber, D. Ulmer) of the special session "Arithmetic Geometry" in the "Joint Meeting" of the Unione Matematica Italiana and the American Mathematical Society, Pisa (Italy) June 10-14, 2002.
- Member of the scientific committee (with J-M. Fontaine, G. Henniart, U. Jannsen, A. Scholl, N. Schappacher) of the "International Conference in Arithmetic Algebraic Geometry", Regensburg (Germany), May 6-10, 2002.

- Organizer (with F. Baldassarri) of the international conference “ p -adic modular forms and p -adic L -functions”, Villa Monastero, Varenna, June 3-9, 2001
- Organizer (with F. Pappalardi e R. Schoof) of the international conference “Elliptic curves, Modular Forms and Galois Representations”, Università Roma III, July 19-23, 1999.

III. Participation in PhD committees at other Institutions

- Member of the examination committee (several candidates), Università La Sapienza, Roma, March 2012.
- Member of the examination committee of Filippo Nuccio, Università La Sapienza, Roma, May 2009.
- Member of the examination committee of Antonella Perucca, Università La Sapienza, Roma, January 2009.
- Member of the examination committee for Miriam Ciavarella, Università di Torino, February 2005.
- Member of the examination committee for Victor Rotger, Universitat de Barcelona, January 2003.
- Member of the examination committee (several candidates), Università La Sapienza, Roma, March 2001.
- Member of the examination committee for C. Cornut, Université Louis Pasteur, Strasburgo, December 2000.
- Member of the examination committee, Padova, Febbraio 2000.
- Member of the examination committee for L. Terracini, Université Paris XIII, December 1998.

IV. Other information

- Referee for the National Science Foundation and NSA-AMS (USA), NSERC (Canada) and Royal Society of New Zealand.
- Referee in the tenure and promotion procedures at various US and Canadian Universities.
- Referee for several international mathematical journals.
- Member of selection and evaluation committees for permanent positions at different levels in Italy.

RESEARCH

I. Research interests. Number theory and arithmetic algebraic geometry; in particular: arithmetic of elliptic curves, L -functions and modular forms, Iwasawa theory, arithmetic properties of algebraic cycles.

II. Papers

Research articles

1. (With G. Canuto) *Good reduction of elliptic curves over $\mathbf{Q}(\sqrt[3]{2})$* , Archiv der Mathematik **50** (1988) 42-50.
2. (With H. Darmon) *Kolyvagin's descent and Mordell-Weil groups over ring class fields*, Journal für die Reine und Angewandte Mathematik **412** (1990) 63-74.
3. *Iwasawa theory, L -functions and Heegner points*, PhD Thesis, Columbia University (1992).
4. *An annihilator for the p -Selmer group by means of Heegner points*, Atti Acc. Naz. Lincei, Classe di Sc. Fis., Mat. e Nat., Rendiconti Lincei, Mat. e Appl., Serie 9, Vol. **5**, Fasc. 2 (1994) 129-140.
5. (With H. Darmon) *Derived heights and generalized Mazur-Tate regulators*, Duke Math. Journal **76** (1994) 75-111.
6. *Selmer groups and Heegner points in anticyclotomic \mathbf{Z}_p -extensions*, Compositio Math. **99**, n. 2 (1995) 153-182.
7. (With H. Darmon) *Derived p -adic heights*, American Journal of Math. **117** (1995) 1517-1554.
8. *p -adic heights and p -adic L -functions*, Atti I Incontro Italiano di Teoria dei Numeri, Rend. Sem. Mat. – Univ. Pol. Torino, Vol. **53**, N. 3 (1995) 193-206.
9. (With H. Darmon) *Heegner points on Mumford-Tate curves*, Inventiones Math. **126**, Fasc. 3 (1996) 413-453.
10. *Growth of Mordell-Weil groups in anticyclotomic towers*, Proc. Symp. Arithmetic Geom., F. Catanese, ed., Arithmetic Geometry, Symposia Mathematica Vol. XXXVII Cambridge Univ. Press (1997) 23-44.
11. *Elliptic curves and special values of L -series*, Proc. XIX Journées Arith., Collectanea Mathematica Vol. XLVIII, Fasc. 1-2 (1997) 31-39.

- 12.** (With H. Darmon) *A rigid analytic Gross-Zagier formula and arithmetic applications* (With una appendice di B. Edixhoven), *Annals of Math.* **146** (1997) 111-147.
- 13.** (With H. Darmon) *Heegner points, p -adic L -functions, and the Cerednik-Drinfeld uniformization*, *Inventiones Math.* **131** (1998) 453-491.
- 14.** (With H. Darmon) *Non-triviality of families of Heegner points and ranks of Selmer groups over anticyclotomic towers*, *J. Ramanujan Math. Soc.* **13** (1998) 15-24.
- 15.** (With H. Darmon) *Euler systems and Jochnowitz congruences*, *American Journal Math.* **121**, n. 2 (1999) 259-281.
- 16.** (With H. Darmon) *p -adic periods, p -adic L -functions, and the p -adic uniformization of Shimura curves*, *Duke Math. Journal* **98**, no. 2 (1999) 305-334.
- 17.** *Iwasawa theory for elliptic curves over imaginary quadratic fields*, *Atti delle XXI Journées Arithmétiques, J. Th. Nombres de Bordeaux* **13**, Fasc. 1 (2001) 1-25.
- 18.** (With H. Darmon) *The p -adic L -functions of modular elliptic curves*, “Mathematics Unlimited – 2001 and Beyond”, Springer Verlag (2001) 109-170.
- 19.** (With H. Darmon, A. Iovita, and M. Spiess) *Teitelbaum’s exceptional zero conjecture in the anticyclotomic setting*, *American J. Math.* **124** (2002) 411-449.
- 20.** (With H. Darmon, P. Green) *Periods and points attached to quadratic algebras*, MSRI Publ. 49, Cambridge Univ. Press, 323-367, 2004.
- 21.** (With H. Darmon) *A Birch and Swinnerton-Dyer conjecture for the Mazur-Tate circle pairing*, *Duke Mathematical Journal* **122** (2004) n. 1, 181-204.
- 22.** (With H. Darmon) *Iwasawa’s Main Conjecture for elliptic curves over anticyclotomic \mathbf{Z}_p -extensions*, *Annals of Mathematics* (2) **162** (2005) no. 1, 1-64.
- 23.** (With H. Darmon) *Hida families and rational points on elliptic curves*, *Inventiones Math.* **168** (2007) no. 2, 371-431.
- 24.** (With H. Darmon, S. Dasgupta) *Stark-Heegner points and special values of L -series*, “ L -functions and Galois representations”, London Math. Society Lecture Notes **320**, Cambridge Univ. Press, 1-23, 2007.

- 25.** (With H. Darmon) *Rationality of Stark-Heegner points over genus fields of real quadratic fields*, *Annals of Math.* **170** (2009) 287-313.
- 26.** (With H. Darmon, A. Iovita) *Families of automorphic forms on definite quaternion algebras and Teitelbaum's conjecture*, *Astérisque* vol. 331 (2010) p. 29-64.
- 27.** (With H. Darmon, K. Prasanna) *p -adic Rankin L -series and rational points on CM elliptic curves*, Jonathan Rogawski Memorial Volume, *Pacific J. Math.* **260** (2012) no. 2, 261–303.
- 28.** (With H. Darmon, K. Prasanna) *Generalised Heegner cycles and p -adic Rankin L -series*, (With an appendix by B. Conrad), *Duke Math. J.* **162** (2013), n. 6, 1033–1148.
- 29.** (With H. Darmon, K. Prasanna) *Chow-Heegner points on CM elliptic curves and values of p -adic L -functions*, *Int. Math. Res. Not.* (2014), no. 3, 745–793.
- 30.** (With H. Darmon) *Kato's Euler system and rational points on elliptic curves I: A p -adic Beilinson formula*, *Israel J. Math.* **199** (2014) n. 1, 163–188.
- 31.** (With H. Darmon, V. Rotger) *Beilinson-Flach elements and Euler systems I: Syntomic regulators and p -adic Rankin L -series*, *J. Alg. Geometry* **24** (2015) no. 2, 355–378.
- 32.** (With H. Darmon, V. Rotger) *Beilinson-Flach elements and Euler systems II: The Birch and Swinnerton-Dyer conjecture for Hasse-Weil-Artin L -series*, *J. Alg. Geometry* **24** (2015) no. 3, 569–604.
- 33.** (With A. Bertì, R. Venerucci) *Congruences between modular forms and the Birch and Swinnerton-Dyer conjecture*, “Elliptic curves, modular forms and Iwasawa theory”, John Coates' 70th Birthday Proceedings, Springer Proceedings in Mathematics and Statistics Vol. 188 (2017) 1–31.
- 34.** (With H. Darmon, K. Prasanna) *p -adic L -functions and the coniveau filtration on Chow groups*, (With an appendix by B. Conrad), accepted for publication on *Crelle Journal*.

Expository articles

- 1.** (With G. Canuto) *La congettura di Shimura-Taniyama-Weil*, *Boll. U.M.I.* (7), 10-A (1996) 213-247.
- 2.** *L'Ultimo Teorema di Fermat*, *L'Ins. Mat. Sc. Int.*, vol. **19B**, n. 3 (1996) 236-247.

3. *Curve ellittiche e numeri congruenti*, Archimede **1** (2001) 32-45.
4. *L'ultimo teorema di Fermat e alcuni aspetti della Teoria dei numeri nell'ultimo decennio*, (13 pagine) Enciclopedia del Novecento "Treccani", Supplemento III, volume A-G (2004) 487-493.
5. *L'Ultimo Teorema di Fermat*, "La matematica", vol. 2, Einaudi (2008) 313-334.
6. *Campi di numeri, Rappresentazioni galoisiane, Forme modulari, Congettura di Birch e Swinnerton-Dyer*, voci della Enciclopedia della Scienza e della Tecnica "Treccani".
7. *Report on the Birch and Swinnerton-Dyer conjecture*, proceedings of the symposium "Advances in Number Theory and Geometry", International School and Workshop on "150 years of Riemann Hypothesis" (director E. Bombieri), Milan Journal of Mathematics, vol. 78 (2010) p. 153-178.
8. *Regulators, L-functions and rational points*, Proceedings of the XIX congress of Unione Matematica Italiana, Boll. Unione Mat. Ital. (9) 6 (2013), no. 1, 191–204.
9. (With F. Castella, H. Darmon, S. Dasgupta, K. Prasanna, V. Rotger) *p-adic L-functions and Euler systems: a tale in two trilogies*, Proceedings of the Durham Symposium on Galois representations and L-series, "Automorphic Forms and Galois Representations", Vol. 1, F. Diamond, P.L. Kassaei, M. Kim, editors, LMS Lecture Note Series 414, Cambridge University Press (2014) 52-101.

III. Invited lectures

1. Number Theory Seminar, Princeton University, October 1991.
2. Number Theory Seminar, Columbia University, April 1992.
3. Conference on Arithmetic Geometry with an Emphasis on Iwasawa Theory, Arizona State University, March 1993.
4. Giornate di Geometria Algebrica e Argomenti Correlati, Università dell'Aquila, January 1994.
5. Symposium in Arithmetic Geometry, Cortona, October 1994.
6. Number Theory Seminar, McGill University, December 1994.
7. Primo Incontro Italiano di Teoria dei Numeri, Terza Università di Roma, January 1995.
8. Conferenza Mathesis, Università di Pavia, April 1995.
9. Seminario di Teoria dei Numeri, Università di Venezia, May 1995.

10. Journées Arithmétiques, session talk, Universitat de Barcelona, July 1995.
11. Seminario di Teoria dei Numeri, Università di Venezia, December 1995.
12. Number Theory Session, American Mathematical Society Annual Meeting, Orlando (Florida), January 1996.
13. Number Theory Seminar, series of 3 lectures, Institute for Advanced Study, February 1996.
14. Number Theory Seminar, University of Maryland, March 1996.
15. Number Theory Seminar, McGill University, October 1996.
16. Elliptic curves and Applications, Japan-U.S. Institute, The Johns Hopkins University, March 1997.
17. Seminario, Università di Torino, May 1997.
18. Séminaire de Théorie des Nombres, Université de Paris Sud, Orsay, May 1997.
19. Séminaire de Théorie des Nombres, Centre Emile Borel, Parigi, July 1997.
20. C.I.M.E. conference “Elliptic Curves”, Cetraro, July 1997.
21. Summer School on Elliptic Curves, series of 3 lectures, ICTP Trieste, August 1997.
22. Séminaire de Théorie des Nombres, series of 2 lectures, Université de Strasbourg, March 1998.
23. “Galois representations in Arithmetic Geometry”, Crete, July 1998.
24. Special year on number theory, series of 6 lectures on “Iwasawa theory for modular forms”, McGill University, September 1998.
25. Séminaire de Théorie des Nombres, Université de Paris-Nord, December 1998.
26. Colloque “Points Speciaux et Problèmes Modulaires”, series of 3 lectures, Centre Emile Borel, Parigi, March 1999.
27. Seminario di Teoria dei Numeri, series of 4 lectures, Università di Padova, March 1999.
28. Seminario, Università La Sapienza, Roma, April 1999.
29. XXI Journées Arithmétiques, plenary lecture, Roma, July 1999.
30. International conference on Arithmetic Algebraic Geometry, Venezia, September 1999.

31. Seminaire de Théorie des Nombres, Institut Fourier, Grenoble, November 1999.
32. Seminario, Università Tor Vergata, Roma, April 2000.
33. 3rd Panhellenic Conference on Algebra and Number Theory, plenary lecture, Anogia, Crete, September 2000.
34. Workshop "Special Values of Rankin L-Series", MSRI, Berkeley, December 2001.
35. Colloquium de Giorgi, Scuola Normale Superiore, Pisa, February 2002.
36. Seminario, Università Milano Bicocca, Milano, June 2002.
37. Symposium "L-functions in Arithmetic", Muenster, September 2002.
38. Kolloquium, Muenster, November 2002.
39. Seminaire de Théorie des Nombres, Université de Paris VI, December 2002.
40. Number Theory Seminar, ETH Zürich, December 2002.
41. Giornata dei Rendiconti del Seminario Matematico di Padova, Padova, January 2003.
42. Number Theory Seminar, Universitat de Barcelona, January 2003.
43. Seminaire de Théorie des Nombres, Université Louis Pasteur, Strasbourg, March 2003.
44. International Conference on Iwasawa theory, Besancon, July 2004.
45. Symposium "L-functions and Galois representations", Durham, July 2004.
46. Seminario, Università di Roma II, February 2005.
47. Seminario, Università di Genova, March 2005.
48. "Open Questions and Recent Developments in Iwasawa Theory (in honor of Ralph Greenberg 60th birthday)", Boston, June 2005.
49. "Arithmetic Algebraic Geometry", Erwin Schroedinger International Institute for Mathematical Physics, Vienna, series of 2 lectures, January 2006.
50. " p -adic modular forms", CIRM, Luminy, July 2006.
51. Euler 300th conference "Arithmetic Geometry", Euler Institute, St. Petersburg, July 2007.
52. "Conference on Automorphic Forms and Shimura Varieties", ICTP, Trieste, July 2007.

53. “Arithmetic Geometry”, Tate Institute, Bangalore, March 2008.
54. “London-Paris Number Theory Seminar”, London, May 2008.
55. Lecture at “Olympiads of Mathematics”, Cesenatico, May 2008.
56. “Iwasawa 2008”, Irsee, June 2008.
57. “Arithmetic Algebraic Geometry”, Oberwolfach, August 2008.
58. “Advances in Number Theory and Geometry”, International School and Workshop on “150 years of Riemann Hypothesis” (director E. Bombieri), series of 2 lectures, Verbania, April 2009.
59. Seminario, Università di Roma I, May 2009.
60. Universitat Politècnica de Catalunya, 10 hour lecture series on “ p -adic L -functions and rational points on elliptic curves”, Barcelona, June 2009.
61. Plenary lecture at “AlfaClass - La Summer School di matematica del Progetto Diderot”, Solonghello (AL), September 2009.
62. Number Theory Seminar, CRM, Barcelona, September 2009.
63. Colloquium, University of Madrid, series of 3 lectures, January 2010.
64. Seminar, University of Bonn, January 2010.
65. “Rational Points - Theory & Experiment”, ETH Zürich, May 2010.
66. Talk at Poznan University, June 2010.
67. Talk at Szczecin University, June 2010.
68. “From p -adic differential equations to arithmetic algebraic geometry” on the occasion of Francesco Baldassarri 60th birthday, Padova, February 2011.
69. Seminar, Università di Pavia, May 2011.
70. XIX Congresso, Unione Matematica Italiana, plenary lecture, Bologna, September 2011.
71. “Cycles on Modular Varieties”, Banff, October 2011.
72. “Iwasawa 2012”, Heidelberg, July 2012.
73. “Rational points on curves: a p -adic and computational perspective”, Oxford, September 2012.
74. “Arithmetic of L -functions”, LMS Meeting, Bristol, October 2012.
75. Algant mini-course (8 hours), Concordia & McGill, Montreal, November 2012.
76. “Workshop on Algebraic Number Theory”, Wellington (NZ), December 2012.

77. Number Theory Seminar, University College of London, March 2013.
78. Number Theory Seminar, Université de Caen, June 2013.
79. Workshop “Arithmetic intersection theory and Shimura varieties”, University of Bonn, February 2014.
80. Conference “Arithmetic of Eisenstein series”, Darmstadt University, September 2014.
81. Workshop “ p -adic methods in number theory”, Università degli Studi di Milano, October 2014.
82. Workshop “Counting arithmetic objects”, McGill University, November 2014.
83. Algebraic Geometry Seminar, University of Zürich, December 2014.
84. Number Theory Seminar, University of Bielefeld, January 2015.
85. Kolloquium, University of Bielefeld, January 2015.
86. Number Theory Seminar, University of Regensburg, January 2015.
87. Conference “Elliptic curves, modular forms and Iwasawa theory” (A conference in honour of the 70th Birthday of John Coates), Cambridge University, March 2015.
88. Kolloquium, University of Regensburg, January 2015.
89. Kolloquium, University of Münster, July 2015.
90. Clay Workshop “Motives and Automorphic Forms”, University of Oxford, September 2015.
91. Conference “L-functions and Arithmetic” (A conference in honour of the 60th Birthday of Karl Rubin), Harvard University, June 2016.
92. SFB Meeting in Mainz, November 2016.

IV. PhD students

- Matteo Tamiozzo (Universität Duisburg-Essen), in progress.
- Yangyu Fan (co-supervised with Prof. Seveso at Università di Milano), in progress.
- Andrea Agostini (Universität Duisburg-Essen), in progress.

- Andrea Berti (Università di Milano), thesis title: *On the Birch and Swinnerton-Dyer conjecture for elliptic curves of analytic rank one*, 2014.
(Current position: Teaching)
- Rodolfo Venerucci (Università di Milano), thesis title: *p-adic regulators and p-adic families of modular forms*, 2013.
(Current position: Assistant Professor at Universität Duisburg-Essen)
- Marco Seveso (Università di Milano), thesis title: *Stark-Heegner points and Selmer groups of abelian varieties*, 2009.
(Current position: Assistant Professor at Università di Milano)
- Nicola Marigonda (Università di Milano), thesis title: *Towers of Drinfeld modular curves and special values of L-functions*, 2008.
(Current position: Teaching)
- Stefano Vigni (Università di Milano), thesis title: *A Gross-Zagier formula for a certain anticyclotomic p-adic L-function*, 2005.
(Current position: Associate Professor at Università di Genova)
- Matteo Longo (Università di Padova), thesis title: *On the Birch and Swinnerton-Dyer conjecture over totally real fields*, 2004.
(Current position: Associate Professor at Università di Padova)