

Curriculum vitae

Alessandro Berarducci

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Personal

Born in Roma, Italy, 11th June, 1958. Nationality: Italian.

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Education

- (1978–83) Laurea degree in mathematics, Università di Roma “La Sapienza” (degree conferred 11th May 1983) Title of dissertation: Functional programming and representability in systems of Combinatory Logics. Thesis advisor: Prof. Corrado Böhm. Grade: 110/110 cum laude.
- (1983–84) Graduate School of Mathematical Logic, Siena, Italy.
- (1984–1989) Ph.D. in Mathematics, University of California at Berkeley. Degree conferred: 23rd May, 1989. Title of the dissertation: The interpretability logic of Peano Arithmetic. Thesis advisor: Prof. Robert Solovay.

Career

- (Aug 1984 - May 1989) University of California at Berkeley. Research Assistant (Fall 84), Teaching Assistant (Fall 85, Spring 86, Spring 87, Fall 87), Associate (Spring 88, Fall 88), Research Assistant (Spring 89). Teaching: calculus, discrete mathematics, mathematical logic.
- (Jan. 1990 - Nov. 1992) RESEARCHER (“Ricercatore universitario”), University of L’Aquila (Italy), Department of Mathematics. Teaching: mathematical logic, mathematical methods for computer science.
- (Nov. 1992 - 2001) ASSOCIATE PROFESSOR, University of Pisa, Department of Mathematics. Teaching: Various courses of Mathematical Logic (laurea program in mathematics, 1992-2001), Logic (laurea program in computer science, Nov. 1994 - Nov. 1997).
- (Jan. 2001 - present) FULL PROFESSOR, University of Pisa, Department of Mathematics. Teaching: Mathematical Logic, Basic Set Theory, Advanced Set Theory, Model Theory, Complexity Theory, Arithmetic (Degree in mathematics), Language and Methods of Mathematics, Discrete Mathematics (Degree in computer science).

Professional activities (2007-present)

- (2008-present) Member of the editorial board of the “Journal of Symbolic Logic”, ISSN: 0022-4812, <http://www.aslonline.org/journals-journal.html>.
- (2007-2008) Member of the editorial board of “Logic and Analysis”.
- (2008-present) Member of the editorial board of “Journal of Logic and Analysis” (successor of “Logic and Analysis”).
ISSN: 1759-9008, <http://logicandanalysis.org/index.php/jla/index>
- (2008) Member of the Program Committee of the Logic Colloquium 2008, July 3-8 (2008) Bern. <http://www.lc08.iam.unibe.ch/>
- (2011) Member of the Program Committee of WoLLIC 2011, 18th Workshop on Logic, Language, Information and Computation, May 18th to 21st, 2011, University of Pennsylvania, Philadelphia, USA. <http://wollic.org/wollic2011/>
- (2011) Coordinator of the Logic session of the “XIX Congresso dell’Unione Matematica italiana”, 1217 Sept. 2011, Bologna. <http://umi2011.dm.unibo.it/index>

Recent graduate students and postdoc (2007-present)

Tamara Servi (perfezionamento SNS 2007), Antongiulio Fornasiero (postdoc Pisa 2003-07), Annalisa conversano (doctorate Siena 2009), Marcello Mamino (perfezionamento SNS Dec. 2010), Vincenzo Mantova (SNS current).

Research projects

- Participant to PRIN 2009 (MIUR project). Title: O-minimalità, teoria degli insiemi, metodi e modelli non standard e applicazioni. Protocol: 2009WY32E8.003. Ente finanziatore: MIUR. Finanziato: 17/10/2011 - 17/10/2013. National coordinator: Toffalori Carlo. Local coordinator: Forti Marco. Ateneo/Ente: Univ. di Pisa.
- Participant to PRIN 2007 (MIUR project). Title: O-minimalità – Metodi e modelli non standard – Teoria degli insiemi. Protocol 2007PRYAAF.004. Dates: 22/09/2008 - 22/09/2010. National coordinator: Carlo Toffalori. Local coordinator: Marco Forti. Ateneo/Ente: Univ. di Pisa.
- Participant to MODNET: an FP6 Marie Curie Research Training Network in Model Theory and its Applications, funded by the European Commission under contract number MRTN-CT-2004-512234 (MODNET). 1 Jan. 2005 - 31 Dec. 2008.
- Participant to the project: Geometría a Real (GEOR) . Entidad Financiadora: DGICYT (MTM2005-02865). Duración: 2006-08. Investigador Principal: Jesús Ruiz Sancho. Asignación: 87000 Euros.
- Participant to PRIN 2004 (MIUR project): Titolo: Metodi di Logica in Algebra, Analisi e Geometria. Dates: 30/11/2004 - 30/11/2006. National coordinator: Carlo Toffalori (Camerino). Local coordinator: Forti Marco.

Ateneo/Ente: Univ. di Pisa. Finanziamento assegnato: 129000 Euro,
<http://cofin.cineca.it/>

- Participant to: Titolo: Teoria dei Modelli e Teorie degli Insiemi, loro interazioni ed applicazioni. Ente: MIUR, PRIN 2002 (24 months starting 16/dec/2002). Coordinator: Carlo Toffalori (Camerino). Finanziamento assegnato: 73000 Euro
- Participant to: Título del proyecto: Algoritmos en Álgebra y Geometría Algebraica. Entidad Financiadora: DGES, Acción Hispano-Italiana (HI2000-0127). Duración: 2001-02. Investigador Principal: Carlos Andradás Heranz. Asignación: 8474 Euros
- Participant to: Título del proyecto: Algoritmos en Álgebra y Geometría Algebraica. Entidad Financiadora: DGES, Acción Hispano-Italiana (HI19970122). Duración: 1998-1999. Investigador Principal: Carlos Andradás Heranz. Asignación: 7933 Euros
- Participant to: Titolo: Logica Matematica e sue connessioni con l'Algebra, la Geometria e l'Analisi. Ente: MURST, PRIN 1998 (24 months starting nov/1998). Coordinator: Franco Montagna (Siena). Finanziamento assegnato, Lire 291 milioni.
- Member of INDAM-GNSAGA: Gruppo Nazionale per le Strutture Algebriche, Geometriche e le loro Applicazioni (Istituto Nazionale di Alta Matematica Francesco Severi, Città Universitaria, 00185 Roma).

Talks, visits, scientific activities

- (1984- 1989) Ph.D. Program, Berkeley, California.
- Contributed talk at the meeting of the Association for Symbolic Logic (Berlin, July 25 – Aug 1, 1989).
- (May 1989- Jan. 1990) Postdoc at the Department of Mathematics of the Univ. of Siena (director of Research Franco Montagna) with a grant of the Istituto Nazionale di Alta Matematica Francesco Severi.
- Conference at the meeting “Foundations of Logic and Computer Science” (Kosice, Sept. 4–6, 1989).
- Conference at the Dipartimento di Matematica G. Castelnuovo di Roma, invited by prof. C. Bernardi. (Roma, Dec. 7, 1989).
- (1990, Jan.–Mar.) Visiting the Department of Mathematics of the University of Oxford (invited by prof. A. Macintyre).
- June 19, 1990. Conference at the workshop on “Proof Theory, Arithmetic and Complexity” (San Diego, California, June 18–22).
- Conference at the meeting CIRM “Logic and Computer Science” (Luminy, Marsiglia, June 25-29, 1990).
- Invited lectures at the INDAM meeting “Metodi effettivi in algebra e logica” (Cortona, Oct. 8–12 1990).

- Jan 23, 1991. Conference at the Department of Mathematics of the University of Amsterdam, invited by prof. D. De Jongh.
- (Sept. - Dec. 1991) Visiting the Department of Mathematics of the University of Oxford (invited by prof. A. Wilkie).
- Contributed talk at the Logic Colloquium (Keele, England, June 1993).
- Conference at the meeting “Proof Theory, Complexity, Metamathematics” (April 5-8, 1994, University of Technology, Wien).
- Graduate course on lambda calcolo at the summer school “Folli” of the European community (Copenhagen, Aug. 1994).
- (1994 - 95) Doctorate course on lambda calculus at the Università di Siena, Italy.
- Contributed talk at the “10-th International Congress of Logic, Methodology and Philosophy of Science” (Firenze, Aug. 1995).
- Cycle of conferences at the Logic colloquium’96 (Donostia - San Sebastian, Spain, July 9-15, 1996).
- Contributed talk at the GNSAGA meeting, Perugia, Nov. 6–8, 1997.
- (Jan. - June 1998) On leave at the “Mathematical Science Research Institute”, Berkeley, during the special semester in model theory.
- Conference on “Factorization in transfinite power series”, at the Mathematical Science Research Institute, Berkeley, February 1998.
- Conference on: “Euler characteristic of o-minimal manifolds and groups”, XIX Incontro di Logica, Udine 6-9 Ottobre 1999.
- Contributed talk, 5th Barcellona logic meeting (Barcellona, July 1999).
- Contributed talk on “o-minimal fundamental group, homology, and manifolds” (joint work with M. Otero), 6th Barcellona logic meeting (Barcellona, July 5–8, 2000).
- Conference on “Questioni di decidibilità nell’ambito della geometria elementare”, 18° Convegno sulla didattica della matematica, Viareggio, Collegio Colombo, 6-7-8 Sept. 2001
- Contributed talk on “Some results and problems on definable sets in o-minimal structures”, XXI meeting of Mathematical Logic, 30 Oct.-3 Nov. 2001, Pontignano (Siena).
- Partecipazione to the meeting: Euro-Conference in Model Theory and Applications, Ravello (Italy), May 27 - June 1, 2002.
- Talk on “Assiomatizza della Geometria Elementare e dei Numeri Reali”, XIX Edizione nazionale delle Olimpiadi di matematica, Cesenatico, 9-10-11 May 2003.
- Partecipazione to the Rencontre Internationale de Théorie des Modèles, 6 et 7 juin 2003, Institut Henri Poincaré, Paris.
- Talk on “Effective o-minimality of the real exponential field and related structures”, (work in collaboration with Tamara Servi), Claude Bernard University Lyon-1, 12 June 2003 Lyon.

- Talk on “Effective o-minimality of the real exponential field and related structures”, (joint work with Tamara Servi), Séminaire général de Logique, 23 June 2003, Paris.
- Talk on “On the field of real numbers with the exponential function”, Udine, 12 Dec. 2003.
- Tutorial on o-minimality at the BIRS Workshop: “Interactions between model theory and geometry”, March 13-18, 2004, Banff Centre, Banff, Alberta.
- Contributed talk at the meeting: Models of Arithmetic and Analysis MARIAN 2004, Pisa, June 25-26, 2004. Title: Definable groups in o-minimal structures
- Participation to “Model Theory and Complex Analytic Geometry”, July 18-24, 2004, Oberwolfach, Germany.
- Plenary speaker at the Logic Colloquium 2004 (European summer meeting of the ASL), July 25-31, 2004, Torino, Italy. Title of the talk: “Definable groups in o-minimal structures”.
- Coorganizer of the XXII Incontro AILA, Pisa 10-13 Feb. 2005. <http://www.dm.unipi.it/aila2005/>
- Invited speaker at the “Colloquium on o-minimality”, March 21-23, 2005, University of Lyon 1, France. Title of the talk “O-minimal measure”.
- Talk at the seminar “Groupes: Propriétés algébriques et équivalence élémentaire”, Université de Paris VII, 14 mars 2005. Title of the talk: “Lie quotients of definable groups in o-minimal structures”.
- Invited speaker at the British Logic Colloquium, September 1-3, 2005, Bristol, UK. Title of the talk “Zero-groups in o-minimal structures”.
- Invited talk at the meeting “Around o-minimality”, School of Maths., Univ. of Leeds, March 11-13 2006. Title: On the infinitesimal subgroup of a definable group.
- International congress “NonStandard Methods and Applications in Mathematics” Pisa, May 25-31, 2006. Contributed talk: O-minimal spectra, Infinitesimal subgroups and cohomology.
- Invited conference at the meeting, Model theory and Algebra Workshop, MODNET research training network in model theory, Camerino, June 14-16, 2007. Title: Cohomology of definable sets in o-minimal expansions of groups (joint work with A. Fornasiero).
- Invited speaker at the special session in “model theory and applications”, Joint International Meeting UMI - DMV, Perugia 18-22 June 2007. Title of the talk: Cohomology and o-minimal structures.
- Participant to the MODNET Barcelona Conference, 3-7 November 2008.
- Complexo Interdisciplinar of the University of Lisbon, CMAF, 10-16 March 2009. Cycle of two talks on “Definably compact groups in o-minimal structures”.
- London Mathematical Society Durham Symposium, New Directions in the Model Theory of Fields, Monday 20th July - Thursday 30th July 2009,

Invited speaker. Title of my talk: Equivariant homotopy of definable groups (joint work with M. Mamino).

- Special session “logic” in the 2nd Belgian Mathematical Society - London Mathematical Society Conference, Katholieke Universiteit, Leuven 4-5 December 2009. Invited speaker. Title of my talk: Pillay’s conjectures and the universal cover.
- Workshop: Around Valued Fields and Dependent Theories Model Theory. Mathematisches Forschungsinstitut Oberwolfach, January 3rd - January 9th, 2010. Title of my talk: On the homotopy type of definable groups in an o-minimal structure (joint work with M. Mamino).
- Invited professor at the Gödel Centre of the University of Vienna, 14-18 June 2010
- XXIV Incontro di Logica 2 - 4 February 2011, Bologna. Title of talk: Group covers, o-minimality, and categoricity. <http://ailaxxiv.cs.unibo.it/cgi-bin/index.php?page=0>
- 6 May 2011, Paris, École Normale Supérieure. Invited talk at the seminar “Géométrie et Théorie des Modèles”. Title: Topology of definable groups in tame structures.
- 8 Dec. 2011, Münster, Institut für Mathematische Logik und Grundlagenforschung Invited talk: “Locally definable groups in o-minimal structures”.
- 2 Feb. 2012, Oxford, Mathematical Institute. Invited talk at the logic seminar: “Discrete subgroups of locally definable groups”.

Publications

Alessandro Berarducci

1. Alessandro Berarducci, “Una Generalizzazione dei Funzionali Ricorsivi di Gödel”, *Atti degli Incontri di Logica Matematica*, Siena 1984, pp. 467–476.
2. Alessandro Berarducci and Corrado Böhm, “Automatic Synthesis of Typed Lambda-Programs on Term Algebras”, *Theoretical Computer Science* 39 (1985) 135–154.
3. Alessandro Berarducci, “ Σ_n^0 -interpretations of modal logic”, *Bollettino dell’Unione Matematica Italiana*, (7) 3-A (1989) 177–184.
4. Alessandro Berarducci, “The Interpretability Logic of Peano Arithmetic”, *Journal of Symbolic Logic* 55, no. 3 (1990) 1059–1089.
5. Alessandro Berarducci and Benedetto Intrigila, “Combinatorial principles in elementary number theory”, *Annals of Pure and Applied Logic*, 55 (1991) 35–50.
6. Alessandro Berarducci and Corrado Böhm, “A self-interpreter of lambda calculus having a normal form”, 6th Workshop, CSL ‘92, San Miniato, Italy, *Springer Lecture Notes in Computer Science* 702, E. Börger & al. eds., 1992, 85–99.
7. Alessandro Berarducci and Rineke Verbrugge, “On the provability logic of bounded arithmetic”, *Annals of Pure and Applied Logic*, 61 (1993) 75–93.
8. Alessandro Berarducci and Benedetto Intrigila, “On the cop number of a graph”, *Advances in Applied mathematics* 14 (1993) 389–403.
9. Alessandro Berarducci and Benedetto Intrigila, “Some new results on easy lambda-terms”, *Theoretical Computer Science* 121 (1993) 71–88.
10. Alessandro Berarducci and Marisa Venturini Zilli, “Generalizations of Unification”, *Journal of Symbolic Computations* 16 (1993) 479–491.
11. Alessandro Berarducci and Dikran Dikranjan, “Uniformly approachable functions and spaces”, *Rendiconti dell’Istituto di Matematica dell’Università di Trieste*, 25 (1993) 23–56.
12. Alessandro Berarducci and Paola D’Aquino, “ Δ_0 -complexity of the relation $y = \Pi_{i \leq n} F(i)$ ”, *Annals of Pure and Applied Logic* 75 (1995) 49–56.
13. Alessandro Berarducci, “Infinite lambda-calculus and non-sensible models”, in: *Logic and Algebra (Pontignano 1994)* (Lecture Notes in Pure and Applied Mathematics Series/180), edited by A. Ursini and P. Aglianò, Marcel Dekker Inc., 1996, 339–378.

14. Alessandro Berarducci and Benedetto Intrigila, “Church-Rosser λ -theories, infinite λ -terms and consistency problems”, in: *Logic: from Foundations to Applications, European logic colloquium*, edited by W. Hodges, M. Hyland, C. Steinhorn and J. Truss, Clarendon Press, Oxford, 1996, 33–58.
15. Alessandro Berarducci and Margarita Otero, “A recursive nonstandard model of Normal Open Induction”, *J. of Symbolic Logic* vol. 61, n. 4 (1996) 1228–1241.
16. Alessandro Berarducci, Dikran Dikranjan, Marco Forti, Stephen Watson, “Cardinal invariants and independence results in the poset of precompact group topologies”, *J. of Pure and Applied Algebra* 126 (1998) 19–49.
17. Alessandro Berarducci and Mariangiola Dezani-Ciancaglini, “Infinite λ -calculus and types”, *Theoretical computer science* 212 (1999) 29–75.
18. Alessandro Berarducci and Benedetto Intrigila, Linear recurrence relations are Δ_0 -definable, *Logic and Foundations of Mathematics, Selected contributed papers, LMPS '95* (A.Cantini, E.Casari, P.Minari editors), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, 67–81.
19. Alessandro Berarducci, “Factorization in generalized power series”, *Transactions of AMS*, Vol. 352, N. 2 (1999) 553–577.
20. Alessandro Berarducci and Margarita Otero, “Intersection theory for o-minimal manifolds”, *Annals of Pure and Applied Logic*, 107 (1-3) (2001) 87–119.
21. Alessandro Berarducci, Dikran Dikranjan and Jan Pelant, “Functions with distant fibers and uniform continuity”, *Topology and its Applications*, Volume 121, Issue 1-2 (2002) pp 3-23
22. A. Berarducci, D. Dikranjan, J. Pelant, “Uniform quasi components, thin spaces and compact separation”, *Topology and its applications*, vol. 122, n. 1-2 (2002) 51–64
23. Alessandro Berarducci and Margarita Otero, “O-minimal fundamental group, homology and manifolds”, *J. London Math. Soc.* (2) 65 (2002) 1-14
24. A. Berarducci and M. Otero, “Transfer Methods for O-minimal Topology”, *Journal of Symbolic Logic*, n. 3, vol. 68 (2003) 785–794
(Revised version of: “Some examples of transfer methods for o-minimal structures”, *Atti del convegno SUNLAG : spring stage on Logic - Algebra - Geometry*, Seconda Università Napoli in Caserta, March 21-24, 2000)
25. A. Berarducci and T. Servi, “An effective version of Wilkie’s theorem of the complement and some effective o-minimality results”, *Annals of Pure and Applied Logic* 125/1-3 (2004) 43–74

26. A. Berarducci and M. Otero, “An additive measure in o-minimal expansions of fields”, *Quarterly Journal of Mathematics* 55 (2004) 411–419
27. A. Berarducci, D. Dikranjan, J. Pelant, “An additivity theorem for uniformly continuous functions”, *Topology and its applications*, Vol 146-147C (2005) 339–352
28. A. Berarducci, M. Otero, Y. Peterzil, A. Pillay, “A descending chain condition for groups definable in o-minimal structures”, *Annals of Pure and Applied Logic* 134 (2005) 303-313.
29. A. Berarducci, D. Dikranjan, J. Pelant, Local connectedness and extension of uniformly continuous functions , *Topology and its applications*, Vol. 153, n. 17 (2006) 3355-3371.
30. A. Berarducci, “Zero-groups and maximal tori”, in: *Logic Colloquium 2004*. Editors: A. Andretta, K. Kearnes, D. Zambella, *ASL Lecture Notes in Logic*, Vol. 29 (2006) 33-45
31. A. Berarducci, M. Edmundo, M. Otero, Corrigendum to “Transfer methods for o-minimal topology”: *J. symbolic Logic* Volume 72, Issue 3 (2007), 1079-1080.
32. A. Berarducci, O-minimal spectra, infinitesimal subgroups and cohomology , *Journal of Symbolic Logic* 72, n. 4 (2007) 1177-1193.
33. A. Berarducci, Cohomology of groups in o-minimal structures: acyclicity of the infinitesimal subgroup , *Journal of Symbolic Logic*, Volume 74, Number 3, Sept. 2009, 891-900
34. A. Berarducci, D. Dikranjan, J. Pelant, Products of Straight Spaces, *Topology and its Applications*, Volume 156, Issue 7, 1 April 2009, Pages 1422-1437
35. A. Berarducci and A. Fornasiero, O-minimal cohomology: finiteness and invariance results , *Journal of Mathematical Logic*, vol. 9, No. 2 (2009) 167-182
36. A. Berarducci, M. Mamino, M. Otero, Higher homotopy of groups definable in o-minimal structures, *Israel Journal of Mathematics* 180 (2010) 143-161
37. A. Berarducci, M. Mamino , On the homotopy type of definable groups in an o-minimal structure , *Journal of the London Mathematical Society*, vol. 83 (part 3) 563-586. doi: 10.1112/jlms/jdq080
38. A. Berarducci, Y. Peterzil, A. Pillay , Group covers, o-minimality, and categoricity, *Confluentes Mathematici*, Vol. 2, No. 4 (2010) 473-496

39. A. Berarducci, E. Baro. Topology of definable abelian groups in o-minimal structures. *Bulletin of the London Mathematical Society*. First published online: November 17, 2011, pp. 1-7.
40. A. Berarducci, P. Majer, M. Novaga. Infinite paths and cliques in random graphs. *Fundamenta Mathematicae* 216 (2012), 163-191. <http://journals.impan.gov.pl/fm/>

Preprints

1. A. Berarducci, M. Novaga, P. Majer, Ramsey-type results on random graphs, arXiv:0809.2335. Date 13 Sept. 2008. 17 pp.
2. E. Baro, A. Berarducci, Topology of definable abelian groups in o-minimal structures, arXiv:1102.2494v1, 12 Feb. 2011, 7 pp.

Other papers

1. A. Berarducci “Modal Logic and interpretability (extended abstract)”, *Atti degli incontri di logica matematica, vol. VI, XIII incontro: Logiche modali e temporali*, Siena 28-29-30-31 maggio 1989, 75–83.
2. A. Berarducci and B. Intrigila, “A note on coding techniques in $\mathbf{I}\Delta_0$ ”, *Rapporto Matematico N. 231*, Dipartimento di Matematica dell’università di Siena, Gennaio 1991, 12 pp.
3. A. Berarducci and D. Dikranjan, Uniformly approachable functions, Extended abstract, *Séminaire Initiation à l’Analyse*, G. Choquet, G. Godefroy, M. Rogalski, J. Saint Raymond, 33ème Année, 1993/94, n. 7, 9 pp.
4. A. Berarducci, “An invitation to λ -calculus”, August 7, 1994, 34 pp. [Lectures notes on a graduate course in lambda calculus in Copenhagen and Siena]
5. A. Berarducci, review of: “M. Ajtai, The complexity of the pigeonhole principle, *Combinatorica* 14 (1994), no. 4, 417–433”, in: *Featured Reviews in Mathematical Reviews 1995-1996*, Reviews of Outstanding Recent Books and Papers, D. G. Babbitt and J. E. Kister (eds.), Amer. Math. Soc. 1996, A6–A7
6. A. Berarducci, review of: “Lou van den Dries, Tame Topology and o-minimal structures, London Math. Soc. lecture note series, no. 248. Cambridge 1998”, in: *Bulletin of Symbolic Logic*, vol. 6, n. 2 (June 2000) 216–218
7. A. Berarducci, “I numeri transfiniti”, *Seminari sulla Matematica per gli studenti delle scuole medie inferiori*, Dipartimento di Matematica dell’Università degli Studi di Pisa, Preprint, March 2000