CURRICULUM VITAE
ANTONIO MONTALBÁN

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Citizenship: Uruguay.
Permanent Resident of the USA.
Date of Birth: December 27th, 1978.

RESEARCH INTEREST

Mathematical Logic: Computability theory, Computable mathematics and Reverse mathematics.

EDUCATION

- Licenciatura (B.S.) en Matemáticas. Universidad de la República (UdelaR), Montevideo, Uruguay 2000.
- M.S. in Mathematics. Cornell University, 2002.
- M.S. in Computer Sciences. Cornell University, January 2005.
- Ph.D. in Mathematics. Cornell University, August 2005
   Thesis adviser: Richard A. Shore. Thesis title: *Beyond the Arithmetic.*

EMPLOYMENT (post Ph.D.)

2005-2006. L. E. Dickson Instructor at the University of Chicago.
2006-2007. Postdoctoral position at the University of Victoria Wellington. New Zealand.
2007-2011. Assistant Professor at the University of Chicago.
2011-2012. Associate Professor at the University of Chicago.
2012-current. Associate Professor at the University of California, Berkeley.

AWARDS (POST PH.D.)

- **Sacks Prize 2005**, given to the best Ph.D. thesis in logic by the Association of Symbolic Logic.
- **AMS Centennial Fellowship 2009**, given to young researchers by the American Mathematical Society.
- **Packard Fellowship 2010**. Given to 17 scientists, and, in average, to one mathematician every year.

GRANTS (AS PRINCIPAL INVESTIGATOR)

- **NSF Grant** June 2006-May 2009. DMS-0600824.
- **NSF Grant** Sept 2009-Aug 2012. DMS-0901169.

OTHER ACTIVITIES

- Editor for the Transactions and Memoirs of the AMS, effective 01 February 2012.
- Member of the Council of the ASL.
- Editor for the Perspectives in Mathematical Logic Series.
- Write a column for the quarterly magazine *Uruguay Ciencia.*
- Referee for various journals; Reviewer for Math Reviews and Zentralblatt.

MEETINGS ORGANIZED OR CO-ORGANIZED

- Birthday conference for Richard Shore on January 2007.
- Special session on Computable Structures at the ASL annual meeting in Irvine, CA on May 2008.
- Midwest computability meeting, that meets 3 times a year in Chicago, IL.
- Workshop in Computability Theory, as a satellite for the LC10 in Paris, France, July 2010.
- Workshop in Computability Theory, as a satellite for the LC11 in Barcelona, Spain, July 2011.
- Workshop in Reverse Mathematics, Chicago, IL, September 2011.
- Oberwolfach Seminar in Proof Theory, Germany, October 2011.
- Special session in Algebraic Structures, Asian Logic Colloquium, Wellington, New Zealand, December 2011.
- Special session in Logic at the Latin-american Mathematics Meeting, Cordona, Argentina, August 2012.
- Program Committee, Symposium of Logical Foundations of Computer Science, San Diego, CA, January 2013.
- Special session in Computable structures at the Annual ASL meeting, Waterloo, Canada, May 2013.
- CCR Semester in Computability Theory, Buenos Aires, Argentina, January-June 2013.
- Workshop in Computable Model Theory at BIRS, Banff, Canada, November 2013.

PH.D. STUDENTS CO-ADVISED

- Chris Conidis, graduated 2009 (secondary advisor).
- Damir Dzhafarov, graduated 2011 (secondary advisor).
- Noah Schweber, current

POSTDOCS MENTORED

- Asher Kach, 2011-2012.

TEACHING

- TA at the UdelaR. From Fall 1999 to Spring 2000.
- TA at Cornell University. From Fall 2002 to Spring 2005.
- Instructor at the University of Chicago.
  - Analysis in $\mathbb{R}^n$, part III. Fall 2005.
  - Analysis in $\mathbb{R}^n$, part I. Winter 2006.
  - Analysis in $\mathbb{R}^n$, part III. Spring 2006.
  - Topics in Logic; Reverse Mathematics. Spring 2006.
- Assistant Professor at the University of Chicago.
  4.6 over 5 is my average in teaching evaluations over the 5 undergrad courses I taught as Assistant Professor.
  - Analysis in $\mathbb{R}^n$, part I. Fall 2007.
  - Mathematical Logic I. Fall 2007.
  - Mathematical Logic II. Winter 2008.
  - Mathematical Logic I. Fall 2008.
  - Topics in Logic; Higher Recursion Theory. Fall 2008.
  - Introduction to Analysis and Linear Algebra. Spring 2009.
  - Reverse Mathematics. Fall 2010.
  - Computable Structures. Fall 2010.
  - Introduction to Analysis and Linear Algebra. Spring 2011.
- Assistant Professor at U.C. Berkeley.
  - Mathematical Logic. Fall 2012
  - Abstract Algebra. Summer 2013

MEMBERSHIPS

American Mathematical Society   Association of Symbolic Logic

Publications

(1) *Embedding Jump Upper Semilattices into the Turing Degrees.*
Journal of Symbolic Logic, Vol. 68 (3), 2003, pp. 989-1014.

(2) *Embedding and coding below a 1-generic degree.* With Noam Greenberg.
Notre Dame Journal of Formal Logic, Vol. 44 (4), 2003, pp. 200-216.

(3) *Generalized High degrees have the complementation property.* With N. Greenberg and R. A. Shore.
Journal of Symbolic Logic, Vol. 69 (4), 2004, pp. 1200-1220.

(4) *Teoría de Conjuntos Según Von Newman (Set Theory in the sense of Von Newman).* **Publicaciones Matemáticas del Uruguay**, Vol. 10, 2005, pp. 91-110. (Extracted from my undergraduate thesis.)

(5) *Up to equimorphism, hyperarithmetic is recursive.*
Journal of Symbolic Logic, Vol 70 (2), 2005, pp. 360-378.

(6) *A minimal pair of K-degrees.* With Barbara F. Csima.
Proceedings of the AMS, 134, (2006), 1499-1502.

(7) *There is no order in the Generalized High/Low Hierarchy.*
Archive of Mathematical Logic Vol 45(2), 2006, pp. 215-231.

(8) *Equivalence between Fraïssé's conjecture and Jullien's theorem.*
Annals of Pure and Applied Logic Vol 139 (1-3) 2006, pp. 1-42.

(9) *Boolean Algebras, Tarski Invariants, and Index Sets.* With B. F. Csima and R. A. Shore. **Notre Dame Journal of Formal Logic** Vol 47 (1), 2006, pp. 1-23.

(10) *Indecomposable linear orderings and Theories of Hyperarithmetic Analysis.*
Journal of Mathematical Logic Vol 6, (1), 2006, pp. 89-120.

(11) *Equimorphism invariants for scattered linear orderings.*
Fundamenta Mathmaticae Vol 191, 2006, pp. 151-173.

(12) *A cappable almost everywhere dominating computably enumerable degree.* With George Barmpalias.
Proceedings of the Third International Conference on Computability and Complexity in Analysis (CCA 2006), Vol 167, 2007, pp. 17–31 (electronic).

(13) *On the equimorphism types of linear orderings.*
Bulletin of Symbolic Logic Vol 13, 2007, pp. 71-99.

(14) *Countably complementable linear orderings.*
Order Vol 23, 2006, pp321–331 (2007).

(15) *Computable linearizations of well-partial-orderings.*
Order Vol 24, 2007, p 39-48.

(16) *Ranked Structures and Arithmetic Transfinite Recursion.* With Noam Greenberg.
Transactions of the AMS Vol 360, 2008, pp. 1265-1307.

(17) *Subspaces of Computable Vector Spaces.* With Rodney G. Downey, Denis R. Hirschfeldt, Asher M. Kach, Steffen Lempp, and Joseph R. Mileti.
Journal of Algebra Vol. 314, 2007, pp. 888-894.

(18) *On the triple jump of the set of atoms of a Boolean algebra.*
Proceedings of the AMS, Vol 136, 2008, pp. 2589-2595

(19) *A weakly 2-random set that is not generalized low.* With A. Lewis and A. Nies.
Proceedings of the CiE 2007, Vol 4497, 2007, pp. 474-477.

(20) *Slender Classes.* With Rod Downey.
Journal of the London Math. Society, Vol 78, 2008, pp. 36-50.

(21) *From Automatic Structures to Borel Structures.* With G. Hjorth and B. Khoussainov and A. Nies.
Proceedings of 23rd Annual IEEE Symp. on Logic in Computer Science (LICS 2008), (2008), pp. 431-441.

(22) *The isomorphism problem for torsion-free Abelian groups is analytic complete.* With Rod Downey.
Journal of Algebra, Vol 320, 2008, pp. 2291-2300.

(23) *On the Π_1^1 Separation Principle.*
Mathematical Logic Quarterly Vol 54 (6), 2008, pp. 563-578.

(24) *Notes on the Jump of a structure.*
Mathematical Theory and Computational Practice, 2009, pp. 372-378.

(25) *On Fraïssé's conjecture for linear orders of finite Hausdorff rank.* With Alberto Marcone. **Annals of Pure and applied Logic**, 160, 2009, pp. 355-367.

(26) *Embeddability in the Turing Degrees.*
Logic colloquium 2006, **Lecture Notes in Logic**, 2009, pp. 229-246.

(27) *A Computable $\aleph_0$-categorical Structure Whose Theory Computes True Arithmetic.* With Bakhadyr Khoussainov. **Journal of Symbolic Logic**, 75 (2010), 728-740.

(28) *Computability of Fraïssé limits.* With B. F. Csima; V. Harizanov and R. Miller.
Journal of Symbolic Logic, 76 (1), 2011, pp. 66-93.

(29) *The Slaman-Wehner Theorem in higher recursion theory.* With N. Greenberg and T. A. Slaman.
Proceedings of the AMS, 139 (2011), pp. 1865-1869.

(30) *Counting the back-and-forth types.*
Journal of Logic and Computability, (2010), DOI: 10.1093/logcom/exq048

(31) *On the n-Back-and-Forth types of Boolean Algebras.* With Kenneth Harris.
Transactions of the AMS, 364 (2012), 827–866.

(32) *The Veblen functions for computability theorists.* With Alberto Marcone.
Journal of Symbolic Logic, 76 (2011), 575–602.

(33) *Cuts of Linear Orders.* With A. Kach.
Order, 28 (2011), 593–600.. DOI: 10.1007/s11083-010-9194-9

(34) *K-Trivials are never continuously random.* With G. Barmpalias. N. Greenberg and T. A. Slaman.
Proceedings of the 11th Asian Logic Conference, (2011), 51-58.

(35) *Isomorphism and Bi-Embeddability Relations on Computable Structures.* With E. B. Fokina, S. Friedman, V. Harizanov, J. F. Knight and C. McCoy. **Journal of Symbolic Logic**, 77 (2012), 122-132.

(36) *Open questions in Reverse Mathematics.*
Bulletin of Symbolic Logic, 17 (2011), 431-454.

(37) *Computing Maximal Chains.* with A. Marcone and R. A. Shore
Archive for Mathematical Logic, 51 (2012), 651-660.

(38) *Rice Sequences of Relations.*
Philosophical Transactions of the Royal Society A, 370 (2012), 3464-3487.

(39) *Extensions of Embeddings below computably enumerable degrees.* With R. Downey, N. Greenberg and A. Lewis. **Transactions of the AMS**, 365 (2013), 2977–3018..

(40) *A fixed point for the jump operator on structures.*
Journal of Symbolic Logic, 78 (2013), 425-438.

(41) *Relative to any non-hyperarithmetic set.* With N. Greenberg and T. A. Slaman.
Journal of Mathematical Logic, 13 (2013),.

(42) *A computability theoretic equivalent to Vaught's conjecture.*
Advances in Mathematics, 235 (2013), 56–73.

(43) *Borel structures: a brief survey.* With Andre Nies.
To appear in the **Lecture Notes in Logic**.

(44) *The limits of determinacy in Second Order Arithmetic.* With Richard A. Shore.
To appear in the **Proceedings of the London Math Society**.

(45) *Boolean Algebra Approximations.* With Kenneth Harris.
To appear in the **Transactions of the AMS**.

(46) *Copyable Structures.*
To appear in **Journal of Symbolic Logic**.

(47) *Matemática Computable.*
Submitted for publication. (In Spanish.)

(48) *Coding and Definiability in Computable Structures.*
Submitted for publication.

(49) *Decidability and Undecidability of the Theories of Classes of Structures* with A. Kach.
Submitted for publication.

(50) *Analytic Equivalence Relations satisfying Hyperarithmetic-is-recursive.*
Submitted for publication.

(51) *The Limits of Determinacy in Second Order Arithmetic: Consistency and Complexity Strength*, with R. A. Shore. Submitted for publication.

(52) *Priority arguments via true stages.*
Submitted for publication.

(53) The complexity of computable categoricity. With Downey, Kach, Lempp, Lewis-Pye and Turetsky. Submitted for publication.

INVITED TALKS AT CONFERENCES OR WORKSHOPS

(1) ASL annual meeting. **Chicago**, IL, May 2003. (20m)
(2) Computability and Logic Workshop, **Heidelberg**, Germany, June 2003. (20m)
(3) Southeastern Logic Symposium. **Gainesville**, FL, March 2004 (20m)
(4) Fall 2004, AMS Central Section Meeting. **Evanston**, IL, October 2004. (20m)
(5) Joint Mathematics meetings. **Atlanta**, GA, January 2005. (20m)
(6) ASL Annual Meeting Stanford, **Palo Alto**, CA, March, 2005. (20m)
(7) Computational Prospects of infinity. **Singapore**, July-August 2005. (1hr)
(8) Southeastern Logic Symposium. **Gainesvile**, FL, March 10-12 of 2006. Plenary talk (1hr)
(9) AMS Central Section Meeting. **Notre Dame**, IN, April, 8,9 of 2006. (20m)
(10) Greater Boston Logic Conference, **Boston**, MA, May 12-14 of 2006. (1hr)
(11) Annual Meeting of the ASL, **Montreal**, Canada, May 17-21 of 2006. Plenary talk (1hr)
(12) ASL Summer Meeting "Logic Colloquium '06". **Nijmegen**, Netherlands, July 2006. Plenary talk (1hr)
(13) Proof Theory of arithmetic, **Kyoto**, Japan, August 21st-23rd of 2006. (1hr) (1hr)
(14) Workshop on Computability, Randomness and Model theory, **Auckland**, New Zealand, Nov 2006. (1hr)
(15) Logic, Combinatorics and Independence Results, **Oberwolfach**, Germany, November 2006. (1hr)
(16) Joint Meeting of AMS-NZMS. **Wellington**, New Zealand, Dec 12-15, 2007. (20m)
(17) Computability, Complexity and Randomness, **Nanjing**, China, May 19-23, 2008. (1hr)
(18) Effective Mathematics of the Uncountable, Cuny, **New York** NY. Aug 18-22 of 2008. (1hr)
(19) AMS Fall Eastern Section Meeting, **Middletown**, CT. Oct 11-12 of 2008. (20m)
(20) Computability, Reverse Mathematics and Combinatorics, **Banff**, Canada. December 7-12, 2008. (1hr)
(21) A Conference in Honor of Harvey Friedmans 60th Birthday, **Columbus**, OH. May 15-17, 2009. (40m)
(22) ASL annual meeting. **Notre Dame**, IN, May 20-23, 2009. (30m)
(23) Computability in Europe, **Heidelberg**, Germany, July 2009. (40m)
(24) Workshop on Computability Theory, **Sofia**, Bulgaria, August 2009. (1hr)
(25) Ramsey Theory in Logic, Combinatorics and Complexity, **Bertinoro**, Italy, October 2009. (1hr)
(26) 2do Coloquio Uruguayo de Matemática, **Montevideo**, Uruguay, December 2009. **Tutorial**. (4.5 hrs)
(27) Mal´tsev Meeting, **Novosibirsk**, Russia, May 2010. Plenary talk (1hr)
(28) AMS fall Sectional meeting at **Notre Dame**, November 2010. (20min)
(29) ASL annual meeting. Special Session for L. Harrington. **Berkeley**, CA, March 2011. (30 min)
(30) Computability in Europe, **Sofia**, Bulgaria. June-July 2011. Plenary talk (1hr)
(31) Infinity Meeting, **Barcelona**, Spain, July 2011, (1hr)
(32) Prospects of infinity, **Singapore**, August 2011, (1hr)
(33) Packard Meeting, **Monterey**, CA, September 2011. (15 min)
(34) Seminar in Proof Theorey, **Oberwolfach**, Germany, October 2011. (tutorial, 3hr)
(35) 3er Coloquio Uruguayo de Matemática, **Montevideo**, Uruguay, December 2011. Plenary talk (1 hrs)
(36) Workshop in Computability Theory, **Oberwolfach**, Germany, February 2012.
(37) AMS Sectional Meeting at **Washington**, DC. March 2012 (20 min)
(38) Annual ASL meeting, **Madison**, WI, April 2012. (Plenary talk, 1hr)
(39) Latin American Symposium on Mathematical Logic, **Bogota**, Colombia, June 2012. (Plenary talk, 1hr)
(40) The incomputable, **Cambridge**, UK, June 2012. (1hr)
(41) Logic Colloquium, **Manchester**, UK, July 2012. (Tutorial 3 hrs)
(42) Mamls, **New Brunswick**, NJ, October 2012 (1hr).

Future talks:

(43) Workshop on Computable stability theory, **Palo Alto**, CA, August 2013.
(44) Descriptive set theory and its applications, AMS Sectional Meeting, **Albuquerque**, NM, April 2014.
(45) International Congress of Mathematicians, Section in Logic, **Soul**, Korea, Aug 2014. (45 min)