

# Verónica Becher

February 2017

## Address

Professor Verónica Becher  
Departamento de Computación  
Facultad de Ciencias Exactas y Naturales  
Universidad de Buenos Aires  
Pabellón I, Ciudad Universitaria  
C1428EGA Buenos Aires, Argentina  
Email: [vbecher@dc.uba.ar](mailto:vbecher@dc.uba.ar)  
URL: <http://www.dc.uba.ar/people/profesores/becher>

## Current Position

Associate Professor, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires (UBA).  
Principal Researcher (since Decreto 227/16) Consejo Nacional Investigaciones Científicas y Técnicas (CONICET).  
Chercheuse Laboratoire International Associé INFINIS (LIA INFINIS), Université Paris Diderot-CNRS / Universidad de Buenos Aires-CONICET.

## Area of Specialization

Theoretical Computer Science; randomness, normal numbers, problems on words.  
Erdős number: 3

## Education

Licenciatura en Ciencias de la Computación, Universidad de Buenos Aires, 1990.  
MSc.in Computer Science, University of British Columbia, Vancouver, Canada, 1993. Supervisor: Craig Boutilier.  
PhD. in Computer Science, Universidad de Buenos Aires, 1999. Supervisor: Carlos Alchourrón.  
Postdoctoral Fellowship CONICET, 2000. Supervisor: Gregory Chaitin.

## Visiting Researcher

- Chercheuse/Professeure invitée, Institut de Recherche en Informatique Fondamentale (IRIF), Université Paris Diderot & CNRS, regular visits since 2002
- Visiting Researcher Erwin Schrödinger International Institute for Mathematics and Physics (ESI), University of Vienna, November 11- December 17, 2016.
- Visiting Researcher Institute for Mathematical Sciences, National University of Singapore, June 2014.
- Visiting Researcher, Institut de Recherche Mathématique Avancée, Université de Strasbourg, July 2013.
- Visiting Fellow Isaac Newton Institute for Mathematical Sciences, Cambridge UK, June 2012.
- Chercheuse étranger de la Mairie de Paris en qualité de senior CNRS et Université Paris 7 - Laboratoire d'Informatique Algorithmique: Fondements et Applications et Équipe de Logique Mathématique, November 2008 to February 2009.
- Visiting researcher Department of Mathematics and Computer Science, University of Victoria, Wellington, New Zealand, invited by Rod Downey, November 2004.
- Invited Professor Department of Logic and Philosophy of Language, Universidad de Sevilla, España, to give the course "Information and randomness", January 2002.
- Visiting Researcher IBM Thomas Watson Research Center, New York, USA, to work with Gregory Chaitin, December 1999, and December 2000.

## Publications

### Journal Articles (Impact Factor Thomson Reuters Citation Reports)

- [1] Verónica Becher, Adrain-Maria Scheerer, and Theodore Slaman. “On absolutely normal numbers and their discrepancy estimate”. submitted. 2017.
- [2] Verónica Becher Nicolás Alvarez and Olivier Carton. “Finite-state independence and normal sequences”. submitted. 2017.
- [3] Verónica Becher, Jan Reimann, and Theodore Slaman. “Irrationality Exponent, Hausdorff Dimension and Effectivization”. In: *Monatshefte für Mathematik* (), to appear.
- [4] Verónica Becher, Olivier Carton, and Pablo A. Heiber. “Finite-state independence”. submitted. 2016.
- [5] Verónica Becher, Yann Bugeaud, and Theodore Slaman. “On Simply Normal Numbers”. In: *Mathematische Annalen* 364.1 (2016), pp. 125–150.
- [6] Pablo Turjanski, Gonzalo Parra, Rocío Espada, Verónica Becher, and Diego Ferreira. “Protein repeats from first principles”. In: *Scientific Reports* 6.23959 (2016). URL: <http://www.nature.com/articles/srep23959>.
- [7] Nicolás Alvarez and Verónica Becher. “M. Levin’s construction of absolutely normal numbers with very low discrepancy”. In: *to appear in Mathematics of Computation* (2016).
- [8] Nicolás Alvarez, Verónica Becher, Pablo Ferrari, and Sergio Yuhjtman. “Perfect necklaces”. In: *Advances in Applied Mathematics* 80 (2016), pp. 48–61.
- [9] Verónica Becher, Yann Bugeaud, and Theodore Slaman. “The irrationality exponents of computable numbers”. In: *Proceedings of American Mathematical Society* 144 (2016), pp. 1509–1521.
- [10] Verónica Becher, Pablo A. Heiber, and Theodore Slaman. “A computable absolutely normal Liouville number”. In: *Mathematics of Computation* 84.294 (2015), 2939–2952.
- [11] Verónica Becher, Pablo A. Heiber, and Olivier Carton. “Normality and Automata”. In: *Journal of Computer and System Sciences* 81 (2015), pp. 1592–1613.
- [12] Verónica Becher and Serge Grigorieff. “Borel and Hausdorff Hierarchies in Topological Spaces of Choquet Games and Their Effectivization”. In: *Mathematical Structures in Computer Science* 25.6 (2015), pp. 1490–1519.
- [13] Verónica Becher and Serge Grigorieff. “Wadge hardness in Scott spaces and its effectivization”. In: *Mathematical Structures in Computer Science* 25.6 (2015), pp. 1520–1545.
- [14] Verónica Becher and Theodore Slaman. “On the Normality of Numbers to Different Bases”. In: *Journal of the London Mathematical Society* 90.2 (2014), pp. 472–494.
- [15] Verónica Becher, Pablo Ariel Heiber, and Theodore Slaman. “Normal Numbers and the Borel Hierarchy”. In: *Fundamenta Mathematicae* 226 (2014), pp. 63–77.
- [16] Verónica Becher and Pablo Ariel Heiber. “Normal numbers and finite automata.” In: *Theoretical Computer Science* 477 (2013), pp. 109–116.
- [17] Verónica Becher, Pablo Ariel Heiber, and Theodore A. Slaman. “A polynomial-time algorithm for computing absolutely normal numbers”. In: *Information and Computation* 232.0 (2013), pp. 1–9.
- [18] Verónica Becher and Pablo Ariel Heiber. “A linearly computable measure of string complexity”. In: *Theoretical Computer Science* 438 (2012), pp. 62–73.
- [19] Pablo Barenbaum, Verónica Becher, Alejandro Deymonnaz, Melisa Halsband, and Pablo Ariel Heiber. “Efficient repeat finding in sets of strings via suffix arrays”. In: *Discrete Mathematics and Theoretical Computer Science* 15.2 (2013), pp. 59–70.
- [20] H. Dopazo F. Serra V. Becher. “Neutral theory predicts the relative abundance and diversity of genetic elements in a broad array of eukaryotic genomes”. In: *Plos One* 8.6 (2013), e63915.
- [21] Verónica Becher and Pablo Ariel Heiber. “On extending de Bruijn sequences”. In: *Information Processing Letters* 111.18 (2011), pp. 930–932.
- [22] Verónica Becher, Alejandro Deymonnaz, and Pablo Ariel Heiber. “Efficient computation of all perfect repeats in genomic sequences of up to half a gigabyte, with a case study on the human genome”. In: *Bioinformatics* 25.14 (2009), pp. 1746–1753.

- [23] Verónica Becher and Serge Grigorieff. “From index sets to randomness in  $\emptyset^n$ : random reals and possibly infinite computations. Part II”. In: *Journal Symbolic Logic* 74.1 (2009), pp. 124–156.
- [24] Verónica Becher and Serge Grigorieff. “Random reals à la Chaitin with or without prefix-freeness”. In: *Theoretical Computer Science* 385.1-3 (2007), pp. 193–201.
- [25] Verónica Becher, Santiago Figueira, and Rafael Picchi. “Turing’s unpublished algorithm for normal numbers”. In: *Theoretical Computer Science* 377.1-3 (2007), pp. 126–138.
- [26] Verónica Becher, Santiago Figueira, Serge Grigorieff, and Joseph S. Miller. “Randomness and halting probabilities”. In: *Journal Symbolic Logic* 71.4 (2006), pp. 1411–1430.
- [27] Verónica Becher, Santiago Figueira, André Nies, and Silvana Picchi. “Program Size Complexity for Possibly Infinite Computations”. In: *Notre Dame Journal of Formal Logic* 46.1 (2005), pp. 51–64.
- [28] Verónica Becher and Serge Grigorieff. “Recursion and topology on finite and infinite words for possibly infinite computations”. In: *Theoretical Computer Science* 322.1 (2004), pp. 85–136.
- [29] Verónica Becher and Santiago ra. “Kolmogorov Complexity for Possibly Infinite Computations”. In: *Journal of Logic, Language and Information* 14.2 (2005), pp. 133–148.
- [30] Verónica Becher and Serge Grigorieff. “Random Reals and Possibly Infinite Computations. Part I: Randomness  $\emptyset'$  of the Halting Problem”. In: *Journal Symbolic Logic* 70.3 (2005), pp. 891–913.
- [31] Verónica Becher and Santiago Figueira. “An example of a computable absolutely normal number”. In: *Theoretical Computer Science* 270.1-2 (2002), pp. 947–958.
- [32] Verónica Becher and Gregory J. Chaitin. “Another Example of Higher Order Randomness”. In: *Fundamenta Informaticae* 51.4 (2002), pp. 325–338.
- [33] Craig Boutilier and Verónica Becher. “Abduction as Belief Revision”. In: *Artificial Intelligence* 77.1 (1995), pp. 43–94.

## Editorial, Book Chapters and Proceedings

- [34] “Computability, Complexity and Randomness - Dagstuhl Seminar 12021”. In: ed. by V. Becher, L. Bienvenu, R. Downey, and E. Mayordomo. Vol. 2. 1. 2012, pp. 19–38.
- [35] Verónica Becher. “Turing’s Note on Normal Numbers”. In: *Alan Turing - His Work and Impact*. Ed. by S Barry Cooper and Jan van Leeuwen. First Edition. Elsevier Science, 2012. Chap. Part 1, Chapter 10, pp. 408–411.
- [36] Verónica Becher. “Turing’s Normal Numbers: Towards Randomness”. In: *How the world computes - Turing Centenary Conference CiE 2012*. Ed. by S.B. Cooper, A. Dawar, and B. Löwe. Lecture Notes in Computer Science 7318. Cambridge UK, 2012, pp. 35–45.
- [37] Verónica Becher, Sergio Daicz, and Gregory Chaitin. “Combinatorics, computability and logic. Proceedings of the 3rd international conference, DMTCS ’01”. In: ed. by C. S. Calude, M.J. Dinneen, and S. Sburlan. Discrete Mathematics and Theoretical Computer Science. Constanta, Romania: London: Springer, 2001. Chap. A Highly Random Number, pp. 55–68.
- [38] Carlos Areces and Verónica Becher. “Iterable AGM functions”. In: *Frontiers in belief revision*. Ed. by M.A. Williams and Hans Rott. Applied Logic Series 22. Dordrecht: Kluwer Academic Publishers, 2001, pp. 261–277.
- [39] Carlos Areces, Verónica Becher, and Sebastián Ferro. “Characterization results for d-Horn formulas or on formulas that are true on dual reduced products”. In: *Logic Language and Computation*. Ed. by J. Seligman, N. Braisby, P. Blackburn, L. Cavedon, and A. Shimojima. Vol. Proceedings of the 3rd international conference on information-theoretic approaches to logic, language, and computation (ITALLC). Hsi-tou, Taiwan- June 16-19. 1998. CSLI Lecture Notes 111. CSLI Publications, 2000, pp. 49–66.
- [40] S.Lazzer R.Rodriguez V. Becher E.Fermé and C. Oller. “Some Observations on Carlos Alchourrón’s Theory of Defeasible Conditionals”. In: *Norms Logics and Information Systems*. Ed. by P. Mc Namara and H.Prakken. New Studies on Deontic Logic and Computer Science, IOS Press, 1998, pp. 219–230.
- [41] Verónica Becher. “Two Conditional Logics for Defeasible Inference: A Comparison Preliminary Version”. In: *Advances in Artificial Intelligence*. Vol. 991. Lecture Notes in Computer Science. 1995, pp. 49–58.

- [42] Carlos Areces and Verónica Becher. “Update, the infinite case”. In: *Proceedings of the Argentinean Workshop on Theoretical Computer Science*. 28 Jornadas Argentinas de Informática e Investigación Operativa (JAIIO). Buenos Aires, 1999.
- [43] Verónica Becher. “Unified Semantics for Revision and Update, or the Theory of Lazy Update”. In: *24 Jornadas Argentinas de Informática e Investigación Operativa (JAIIO)*. Buenos Aires: SADIO, 1995.
- [44] Verónica Becher. “E-mailboxes: Golem’s stomachs or a hippie dream?” In: *In Interdisciplinary Aspects of Human Machine Co-existence and Co-operation. Czech-Argentine Workshop “e-Golems”*. Ed. by V. Marik, P. Jacovkis, and O. Štěpánková. Czech Technical University in Prague, 2005, pp. 313–322.
- [45] Craig Boutilier and Verónica Becher. “Abduction As Belief Revision: A Model of Preferred Explanations”. In: *Eleventh National Conference on Artificial Intelligence (AAAI-93)*. 1993, pp. 642–648.
- [46] C. Areces and V. Becher. “On the Logic For Utopia”. In: *Annals of the 1st CACiC*. Bahía Blanca, Argentina, 1995.
- [47] “Analytic AGM Revision”. In: *Technical Report CDMTCS-138*. Centre for Discrete Mathematics and Theoretical Computer Science, The University of Auckland, 2000.

## Research Supervision

Director of group Kapow (Knowledgeable Algorithms for Problems on Words)

### Director of Assistant Researchers CONICET

1. Pablo Turjanski (CONICET 2013-ongoing)
2. Luciana Ferrer (CONICET 2013- 2016)
3. Agustín Gravano (CONICET 2010-2015)
4. Santiago Figueira (CONICET 2007-2010).

### Director of Postdoctoral Researchers

1. Sergio Yuhjtman (ANPCyT 2016-ongoing)
2. Pablo Turjanski (CONICET 2012-2013)

### Director of PhD in Computer Science

1. Leopoldo Taravilse. "Extended de Bruijn sequences", Universidad de Buenos Aires, 2017-ongoing. Director: V. Becher.
2. Nicolás Alvarez, “Algorithms to compute normal numbers”, Universidad Nacional del Sur, 2015-ongoing. With CONICET doctoral fellowship. Director: V. Becher.
3. Pablo Ariel Heiber, “Normal numbers from a computational perspective”, Universidad de Buenos Aires, 2014. With CONICET doctoral fellowship Director: V. Becher.
4. Daniel Gorín, “Automated reasoning techniques for hybrid logics”, 2009. In cotutelle Argentina-France. With CONICET doctoral fellowship. Directors: V. Becher (Argentina), Carlos Areces (France).
5. Sergio Mera, “Modal Memory Logics”, 2009. In cotutelle Argentina-France. With CONICET doctoral fellowship. Directors: V. Becher (Argentina), Carlos Areces (France).
6. Santiago Figueira, “Aspects of randomness”, Universidad de Buenos Aires, 2006. With CONICET doctoral fellowship. Director: V. Becher.

### Director Research Student Fellowships

1. Facundo López Bristot, CIN 2012. Award JAIIO 2013
2. Alejandro Deymonnaz, IBM-BioSidus, 2009-2010.
3. Pablo Ariel Heiber, IBM-BioSidus, 2009-2010.
4. Pablo Barenbaum, IBM-BioSidus, 2009-2010.

5. Melisa Halsband, IBM-BioSidus, 2009-2010.
6. José Orlicki, CIN 2006.

#### **Director of 19 “Tesis de Licenciatura” Universidad de Buenos Aires (equivalent to MSc. thesis)**

7. Martin Epszteyn, 2014.
8. Alejandro Alfonso, 2012.
9. Alejandro Deymonnaz, 2012.
10. Leandro Miquet, 2011.
11. Melisa Halsband, 2010.
12. Lucia Cavatorta, 2009
13. Marcos Foglino, 2009.
14. Jose Orlicki, 2006.
15. Rafael Picchi, 2005. Award Fundación Sadosky.
16. Mariano Moscato, 2005
17. Martín Urtasún, Alejo Caparelli, 2004. Award Microsoft IDS 2003.
18. Alejandro Dau, 2004.
19. Silvana Bonaccio, Rosana Centrone, 2002
20. Silvana Picchi, 2002.
21. Fernando Calderon, Diego Calderón, Norma Marinaro, 2001.
22. Christian Durr, 2001.
23. Santiago Figueira, 2000.
24. Sergio Daicz, 2000. Award , 3rd position, VIII Concurso de Tesis de Maestria CLEI-UNESCO 2001.
25. María de los Angeles Grieco, 1999.

#### **Main International Scientific Responsibilities**

- Council Member of the Association of Symbolic Logic, 2008-2010; 2014-2018. Executive Committee member.
- Council Member of the Division of Logic, Methodology and Philosophy of Science and Technology (DLMPS) of the International Union of History and Philosophy of Science 2016-2019.
- Chair of Committee on Translations, Association for Symbolic Logic, 2008-2010, 2011-2013, 2014-2015.
- Associate Editor of Journal of Logic, Language and Information (Kluwer/Springer), 2005-2009.
- Committee ECOS Argentina-France, responsible for the exact sciences, 2010-2012.
- Responsible for the Argentine side of the agreement on scientific cooperation between Université Paris Diderot and Universidad de Buenos Aires, approved November 2003.
- Steering Committee Computability Complexity and Randomness (CCR) since 2004.
- Program Committee WoLLIC 2012; LSFA 2012, 2015, 2017 CCR 2008, 2009, 2014; CiE 2015; SLALM 2017.
- Reviewer for Acta Mathematica Scientia, Acta Arithmetica, American Mathematical Monthly, Annals of Combinatorics, Austrian Science Fund; Chaos, Solitons & Fractals, Information Processing Letters, Journal of Complexity, Journal of Symbolic Logic, LICS (Logic in Computer Science), Mathematics of Computation (American Mathematical Society), Mathematical Review (American Mathematical Society), Monatshefte für Mathematik, Notre Dame Journal of Formal Logic, NSF (National Science Foundation USA), NSA (National Security Agency; USA), STACS (Symposium on Theoretical Aspects of Computer Science), Theoretical Computer Sciences, Theory of Computing Systems, Transactions on Computational Logic, WoLLIC, among others.

## Main Argentine Scientific Responsibilities

- Associate Head of Departamento Computación Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, October 2014-2016.
- Consejera Académica Suplente CELFI-Datos (Centro Latinoamericano Formación Interdisciplinaria) since 2015.
- Vocal Titular del Consejo de Administración, Fundación Sadosky, since August 2016.
- Comisión Técnica Asesora Ciencias Básicas y Biológicas (CTA4), Universidad de Buenos Aires (UBA) 2005-2006, 2010-2012. Ciencias Físicas, Químicas y Matemáticas, UBA (CTA1), 2003, 2004.
- Miembro Comisión Ad-Hoc FCEyN, 2011-2013 (titular), 2010 (suplente).
- Scientific Assessment Ministry of Science, Technology and Innovation, July 2008-July 2009.
- Miembro CONICET Comisión de Informática, 2007- 2008.
- Miembro Comisión Becas de Informática CONICET, 2015-2016.
- UBA, FCEyN, Fellowships Committee 2003.
- FONCyT Evaluation Committees (2001, 2002, 2003), FONTAR (2002).

## Organization of International Scientific Meetings

1. Computability Session, Logic Colloquium 2017, August 14-20 2017, Stockholm University. Organizers: V. Becher (Universidad de Buenos Aires), D. Hirschfeldt (University of Chicago).
2. Logic and Computer Science Session, Simposio Latinoamericano de Lógica Matemática, Puebla, México. June 26-30, 2017 Organizers: V. Becher (Universidad de Buenos Aires), M. Osorio (Benemérita Universidad Autónoma de Puebla).
3. Algorithmic Randomness Programme, Institute of Mathematical Sciences, Singapore. June 2-30, 2014.
4. Buenos Aires Semester in Computability, Complexity and Randomness, January to June 2013. Organizers: V. Becher and S. Figuiera (Universidad de Buenos Aires), N. Greenberg (Victoria University, Wellington, New Zealand), J. Miller (University of Wisconsin, Madison), A. Montalbán and T. Slaman (University of California Berkeley).
5. Logic and Computability Session, Congreso Latinoamericano de Matemática (CLAM), FAMAF, Universidad Nacional de Córdoba, August 6-10 2012. Organizers: V. Becher (Universidad de Buenos Aires), C. Di Prisco (Instituto Venezolano de Investigaciones Científicas, Venezuela) and A. Montalbán (University of California, Berkeley).
6. Dagstuhl Schloss, Seminar 12021 Computability, Complexity and Randomness, January 8-13, 2012. Organizers: V. Becher (Universidad de Buenos Aires), L. Bienvenu (Université Paris Diderot), R. Downey (University of Victoria, Wellington, New Zealand), E. Mayordomo (Universidad de Zaragoza, España),
7. International Conference on Logic, Computability and Randomness, Universidad de Buenos Aires, January 10-13 2007. Organizers: V. Becher (Universidad de Buenos Aires), R. Downey (University of Victoria, Wellington, New Zealand), and D. Hirschfeldt (University of Chicago).
8. International Conference on Logic, Computability and Randomness, FAMAF Universidad Nacional de Córdoba, Argentina, September 20 to 24, 2004. Organizers: V. Becher (Universidad de Buenos Aires), R. Downey (University of Victoria, Wellington, New Zealand), D. Hirschfeldt (University of Chicago).

## Selected Talks

- 2017 Forthcoming. **Highlight speaker** for the joint LC-CSL session. Logic Colloquium 2017, August 14-20, 2017, Stockholm, Sweden.
- Forthcoming. **Invited speaker**. Computability and Complexity in Analysis (CCA 2017) July 24-27, 2017, Daejeon, Republic of Korea (South Korea).
- 2016 "Construction of normal numbers, computational aspects". Erwin Schrödinger International Institute for Mathematics and Physics (ESI) , November 14, 2016.
- "Finite-state independence and normal sequences" LIA INFINIS Workshop, November 4, 2016, Paris.

- Invited speaker** Computability, Randomness and Applications, Centre International de Rencontres Mathématiques (CIRM) Marseilles, France, June 20–24, 2016.
- Invited lecture** 28th European Summer School in Logic, Language and Information (ESSLLI 2016) , Free University of Bozen-Bolzano, Italy, 15–26 August, 2016.
- 2015 **Conferencia invitada** "Nuevos números normales". Charlas en honor a Joos Heintz por sus 70 años. Técnicas (semi)numéricas en la resolución de sistemas polinomiales. Buenos Aires, October 26 2015.
- Invited speaker** 15th Congress of Logic, Methodology and Philosophy of Science, Session on Mathematical Logic. Helsinki, Finland, August 3–8, 2015.
- Plenary speaker** North American Annual Meeting of the Association for Symbolic Logic, University of Illinois, March 25–28, 2015.
- "New normal numbers", Séminaire General de Logique, Equipe de Logique Mathématique, Université Paris Diderot, February 2, 2015.
- 2014 **Plenary speaker** Workshop of Logic Language and Information (WoLLIC), Valparaiso Chile, September 1–4, 2014.
- Plenary speaker** XVI Simposio Latinoamericano de Lógica Matemática, Buenos Aires, July 27-August 2, 2014.
- 2013 **Plenary speaker** Developments in Computational Models 2013, satellite of CONCUR 2013, "On Turing's note on normal numbers", Buenos Aires, August 26, 2013.
- "On normal numbers", Séminaire Automates, LIAFA, Université Paris Diderot, July 12, 2013
- Lectures on normal numbers, Buenos Aires Semester in Computability Complexity and Randomness, March 2013.
- 2012 **Plenary speaker** Turing Centenary Conference CiE 2012, How the World Computes, "Turing's normal numbers: Towards Randomness", Cambridge, UK, June 18-23, 2012.
- Plenary speaker** in Logic Workshop at Buenos Aires A Tribute to Horacio Arló Costa, "On the Definition of Randomness", Sociedad de Análisis Filosófico, Buenos Aires, August 24, 2012.
- "Sobre el Problema de Dar Ejemplos de de Números Normales", Instituto de Matemática Aplicada del Litoral (IMAL) del CONICET, Santa Fe, April 2012.
- 2011 **Plenary speaker** International Conference on Computability, Complexity and Randomness 2011, "A better complexity of finite sequences". Cape Town, South Africa, January 2011.
- 2010 **Plenary speaker** 1er Congreso Argentino de Bioinformática y Biología Computacional, Mayo 14, 2010, Universidad Nacional de Quilmes, Buenos Aires.
- 2009 "Perfect repeats in the human genome, an exhaustive but efficient computation", IBM Life Science, Watson Research, New York, July 22, 2009.
- "Perfect repeats in the human genome, an exhaustive but efficient computation", IFIBYNE, CONICET, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, May 7, 2009.
- "What do different chromosomes have in common? An exhaustive but efficient computation", Center for Genomic Regulation, Barcelona, España, January 27, 2009.
- 2008 Invited talk. "Cycles in de Bruijn graphs", Journée de 60 ans de Serge Grigorieff, Université Paris Diderot, 15 Janvier 2008.
- 2007 **Plenary speaker** Reunión Anual de Unión Matemática Argentina, "Números reales aleatorios", FAMAF, Universidad de Córdoba, 21 de septiembre de 2007.
- 2006 **Plenary speaker** XIII Simposio Latinoamericano de Lógica Matemática, "Turing's unpublished algorithm for normal numbers", Oaxaca México, 10 Agosto 2006.
- Invited Speaker** "Turing's unpublished algorithm for normal numbers", Turing days, Bilgi Universitesi, Istanbul, 27 May 2006.
- 2005 "Cornucopia of randomness", Third International Workshop on Seminumerical Techniques in Polynomial Equation Solving, meeting in honor of Joos Heintz's 60th birthday, Buenos Aires, October 24-28, 2005.
- "Old and new results in Program size complexity", LIAFA, Université Paris Diderot, France, March 2005.
- 2004 "High Randomness in the spirit of Rice's theorem for computability", Department of Mathematics, University of Victoria at Wellington, New Zealand, November 2004.
- 2003 "Is Complexity reusable?" Primeras Jornadas Latinoamericanas de Ingeniería y Desarrollo de Software. Microsoft Argentina, Pabellón Blanco de La Rural, October 30, 2003. Panelists: Verónica Becher, Yuri Gurevich , Joos Heintz.

- 2002 "Randomness: solved and unsolved questions", Ecole Normal Superieure, Paris, January 2002.  
 "On the Standard proof of randomness", King's College, London, UK, January 2002.  
 "On the Standard proof of randomness", ILLC, University of Amsterdam, The Netherlands, January 2002.
- 2001 "Randomness and real numbers", CREA Ecole Polytechnique, Paris, July 2001.  
 "Examples of higher order randomness", XIV Coloquio Latinoamericano de Algebra, La Falda, Córdoba, Argentina, July 2001.  
 "El azar y los números reales", FAMAFA, Universidad de Córdoba, Argentina, July 2001.

## Current Research Grants

1. PICT-2014-3260 "Algoritmos, Azar y Complejidad Intrínseca " Investigadora Responsable: Verónica Becher, 2016-2018.
2. CONICET PIP Code 11220110101093 "Random sequences: theory and algorithms", Directora, Verónica Becher 2013-2016.

## Previous Research Grants

3. PICT-2010-0525, "Representación sucinta de la información en ingeniería de software y procesamiento de datos", Director: Joos Heintz, co-dirección: V. Becher, 2011-2014.
4. UBACyT 20020100100945, "Programabilidad en la era de la inundación de datos".Director: Joos Heintz, co-director: V. Becher, 2011-2014.
5. PICT-2007-2067, "Programmability versus computability", Dirección V. Becher, 2008-2011.
6. UBACyT X098. Dirección : Joos Heintz. Codirección: V.Becher, 2008-2011.
7. Binational project Argentina-France MINCyT-INRIA/CNRS FRIC/08-tics/01,"Randomness and combinatorics on words" V.Becher (UBA), J.E. Pin (Université Paris Diderot) , 2009-2011.
8. Binational project Argentina-Spain MINCyT-MICINN AR2009-009, "Homogenization Dynamics of Mammalian Genomes. An efficient and exhaustive quantitative pairwise comparison among complete chromosomes", V. Becher (UBA), H. Dopazo (Centro de Investigaciones Príncipe Felipe), 2010-2011.
9. "Algorithms for finding DNA repeats", financed by Biosidus and IBM Argentina, 2009-2011.
10. Binational project Argentina-France SECyT-INRIA/CNRS FRIC06, "Infinite sequences and algorithmic randomness ", V.Becher (UBA), J.E. Pin (CNRS-Université Paris Diderot), 2006-2008.
11. BCV-2009-2-0016 and BCV-2009-1-0015 Red Española de Supercomputación, "Homogenization Dynamics of Mammalian Genomes. An efficient and exhaustive quantitative pairwise comparison among complete chromosomes", H.Dopazo (Spain), V.Becher (Argentina), 2008, 2009.
12. UBACyT X230 "Randomness, Incompleteness and Complexity", 2004-2007.
13. PICT Redes 0172 "Derivations of Gödel's theorem: Incompleteness, complexity and randomness", V. Becher (UBA), D.Vaggione (Universidad Nacional de Córdoba), 2004 – 2007.
14. UBACyT X404,Randomness and infinite computations", 2003-2004.
15. "Algorithms, Complexity and Structure", International Science and Technology (ISAT), Linkages Fund New Zealand, R. Downey (University of Victoria, NZ), V. Becher(UBA), 2003 – 2004.
16. PICT-1999-5382 "Topics in algorithmic information theory", V.Becher, 2000 – 2003.

## Teaching

Departamento de Computación, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires

Algoritmos y Estructuras de Datos I

Teoría de Lenguajes

Información y Azar



Departamento de Lógica y Filosofía del Lenguaje, Universidad de Sevilla, España  
Información y Azar, January 2002.  
Reunión Anual de la Unión Matemática Argentina, Tandil, Argentina  
Información y Azar, october 2010.

## Distinctions

1. Simons Visiting Professorship grant to visit Laboratoire IRIF, Université Paris Diderot - Mathematisches Forschungsinstitut Oberwolfach, January 2018.
2. Chercheur étranger de la Mairie de Paris en qualité de senior CNRS et Université Paris 7, 2008.
3. CESSI Award 2007 for the reconstruction of Alan Turing's "A note on normal numbers".
4. Sadosky Award 2005, recognized researcher abroad, CESSI.
5. Microsoft Award IDS 2004. Classification of Information based on Kolmogorov-Chaitin complexity. Team: V. Becher, S. Figueira, A. Capparelli, and M. Urtasun.

## Media Notes related to my research

1. The Omega Man, New Scientist, March 10, 2001.
2. Omega, entrevista con Gregory Chaitin, por Nora Bär, diario La Nación, Buenos Aires, 29 Abril, 2001.
3. Perfume de Azar, por Martín De Ambrosio, diario Página 12, Buenos Aires, 13 Julio, 2002.
4. Números casuales, por Verónica Engler, Exactamente, Facultad de Ciencias Exactas y Naturales, 3 Marzo, 2004.
5. De puzzles, soluciones y cuelgues de computadoras, por Cecilia Draghi, Cable Número 593, año 16, 24, Oficina de Prensa SEGBE, Octubre 2005.
6. Reconstruyen un manuscrito histórico. Es un problema matemático planteado por Alan Turing, considerado el padre de la computación, por Nora Bär, diario La Nación, 10 Julio, 2007.
7. Turing puso en juego su homosexualidad en el trabajo científico, por Leandro Lacoa, Agencia CTyS, 26 Diciembre, 2012.
8. Être normal? Pas si facile ! Jean-Paul Delahaye, Pour la Science 422: 126- 131. Décembre 2012.
9. Sobre lo azaroso que es el azar, diálogo con Verónica Becher y Theodore Slaman, por Leonardo Moledo, diario Página 12, 10 Abril, 2013.
10. Reunidos por el Azar, por Gabriel Rocca, Servicio de Información Científica de la Facultad de Ciencias Exactas y Naturales, UBA, 12 de Abril 2013.
11. Un encuentro inédito con el Azar, Conectados Año 3, Número 6, Newsletter del Departamento de Computación, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Abril 2013.
12. Entrevista de Adrián Paenza con Theodore Slaman y Verónica Becher en Científicos Industria Argentina. Bloque 1, Bloque 2 TV Canal 7, 18 Mayo, 2013.
13. Alan Turing. El hombre que sabía demasiado, por Nora Bär, diario La Nación, 10 Enero 2014.