

Curriculum Vitae

Name : Alejandro Maass
Date and Place of Birth : November 11, 1965, Santiago, Chile
Nationality : Chilean
Position : Full Professor
Department of Mathematical Engineering U. Chile
Center of Mathematical Modeling U. Chile-CNRS
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Date : April 2017

Academic Degrees

- Mathematical Engineering, University of Chile, June 1990.
- Ph.d. Mathematics, Aix-Marseille University, July 1994.
- Habilitation “à diriger des recherches”, Aix-Marseille University, February 2000.

Research Interests

Ergodic Theory, Topological Dynamics, Symbolic Dynamics, Bioinformatics and Systems Biology.

Prizes and Honors

- *Latin American and Caribbean Mathematical Union Prize* 2009: “In recognition for remarkable work and as a stimulous for further contributions to Mathematics”.
- Member of the *Chilean Academy of Engineering* since 2009.
- Chevalier de l’Ordre National du Mérite, France, May 2007.
- President of the National Council of Sciences FONDECYT-CONICYT 2006-2008.
- President Chilean-French cooperation committee ECOS-Conicyt 2008-2015.

- Member *Grupo Ciencia de Frontera* of the Chilean Academy of Sciences 2004-2006.
- Marcos Orrego Puelma prize of the Chilean Institute of Engineering: best undergraduate student in engineering at University of Chile 1990.

Responsibilities

- Deputy Director Center for Mathematical Modeling, University of Chile (June 2015-May 2017).
- Director Bioinformatics and Mathematics of the Genome Laboratory **Math^{omics}**, U. Chile.
- Member of the “Executive Scientific Committee of the International Collaboration to Sequence the Atlantic Salmon Genome” (2010-today).
- Responsible Master program in Applied Mathematics University of Chile (March 2015-today).

Direction of Ph.d. Theses

1. Pierre-Paul Romagnoli: (co-direction François Blanchard)
Ph.d. in Mathematics University of Chile and Aix-Marseille University, 2002. Actual job: Dean Faculty of Sciences Universidad Andrés Bello, Chile.
2. María Isabel Cortez: (co-direction Jean Marc Gambaudo)
Ph.d. in Mathematics University of Chile and University of Burgundy, 2005. Actual job: Associate Professor Universidad de Santiago, Chile.
3. Camilo Jadur:
Ph.d. in Mathematics University of Chile, 2005. Actual job: Associate Professor Universidad Nacional de Salta, Argentina.
4. Jorge Yazlle:
Ph.d. in Mathematics University of Chile, 2005. Actual job: Dean Faculty of Sciences Universidad Nacional de Salta, Argentina.
5. Mathieu Sablik: (co-direction François Blanchard)
Ph.d. in Mathematics University of Chile and Aix-Marseille University, 2006. Actual job: Professeur Université de Toulouse III-Paul Sabatier, France.
6. José Aliste: (co-direction Jean Marc Gambaudo)
Ph.d. in Mathematics University of Chile and University of Nice, June 2009. Actual job: Assistant Professor Universidad Andrés Bello, Chile.

7. Alvaro Coronel: (co-direction Jean Marc Gambaudo)
Ph.d. in Mathematics University of Chile and University of Nice, June 2009. Actual job: Assistant Professor Universidad Andrés Bello, Chile.
8. Guillermo Espinoza: (co-direction Elisabeth Pécou)
Ph.d. in Mathematics University of Chile and University of Nice, December 2010. Actual job: Assistant Professor Universidad de Los Andes, Chile.
9. Andrés Aravena: (co-direction Anne Siegel)
Ph.d. in Mathematics University of Chile and University Rennes I, December 2013. Actual job: Assistant Professor Istanbul University, Turkey.
10. Alexander Frank:
Ph.d. in Mathematics University of Chile, May 2014. Actual job: Fondecyt Postdoctoral position, Universidad Andrés Bello, Chile.
11. Sebastián Donoso: (co-direction Bernard Host)
Ph.d. in Mathematics University of Chile and University Paris-Est, May 2015. Actual job: Assistant Professor Universidad de O'higgins, Chile.
12. Karina Castillo: (co-direction Frédérique Aberlenc-Bertossi)
Ph.d. in Bioinformatics University of Montpellier I, December 2015. Actual job: Postdoctoral position, Université de Nantes, France.
13. Alex Di Genova: (co-direction Gonzalo Ruz)
Ph.d. in Complex Systems University Adolfo Ibáñez, expected September 2017.
14. María Paz Cortés: (co-direction Eric Goles)
Ph.d. in Complex Systems University Adolfo Ibáñez, expected September 2017.
15. Dante Travisany: (co-direction Eric Goles)
Ph.d. in Complex Systems University Adolfo Ibáñez, expected September 2017.

Direction of Engineering and Master Theses

1. Pierre-Paul Romagnoli: Mathematical Engineering, U. Chile, 1997.
2. Fernando Schwartz: Mathematical Engineering, U. Chile, 1999.
3. Andrés Moreira: Mathematical Engineering, U. Chile, 1999.
4. Rodrigo Radisz: Electrical Engineering, U. Chile, 2000.
5. María Isabel Cortez: Mathematical Engineering, U. Chile, 2002.

6. Vicente Acuña: Mathematical Engineering and Master Computer Science, U. Chile, 2004.
7. Rodolfo Tapia: Mathematical Engineering, U. Chile, 2004.
8. Carito Vargas: Computer Science, U. Chile, 2004 (co-direction Gilles Didier).
9. Alvaro Coronel: Mathematical Engineering, U. Chile, 2005 (co-direction Pierre-Paul Romagnoli).
10. Felipe Torres: Mathematical Engineering, U. Chile, 2005.
11. José Luis González: Mathematical Engineering, U. Chile, 2005.
12. Alonso Silva: Mathematical Engineering, U. Chile, 2006.
13. Felipe Olmos: Mathematical Engineering and Computer Science, U. Chile, 2009 (co-direction Steffen Hartel and Nancy Hitschfeld).
14. Raul Aliaga: Mathematical Engineering and Computer Science, U. Chile, 2010 (co-direction Nancy Hitschfeld).
15. Sebastián Donoso: Mathematical Engineering, U. Chile, 2011.
16. Italo Cipriano: Mathematical Engineering, U. Chile, 2011.
17. Ángel Pardo: Mathematical Engineering, U. Chile, 2012.
18. Guillermo Rodríguez: Master in Biotechnology, U. Chile, 2013.
19. Rodolfo Gutiérrez: Master in Applied Mathematics and Mathematical Engineering, U. Chile, 2015.
20. Francisco Arana: Master in Applied Mathematics and Mathematical Engineering, U. Chile, August 2016 (co-direction Vincent Delecroix).
21. Juan Marshall: Master in Applied Mathematics and Mathematical Engineering, U. Chile, expected May 2017 (co-direction Vincent Delecroix).
22. Martín Ríos: Master in Applied Mathematics and Mathematical Engineering, U. Chile, expected August 2017.

Publications

Articles in mathematics

Articles accepted or submitted to journals

1. M. Cobo, R. Gutiérrez, **A. Maass**, Characterization of minimal sequences associated with self-similar interval exchange maps. Submitted (2017).

2. S. Donoso, F. Durand, **A. Maass**, S. Petite, On automorphism groups of Toeplitz subshifts. Submitted (2017). arXiv:1701.00999
3. F. Durand, A. Frank, **A. Maass**, Eigenvalues of minimal Cantor systems. Submitted (2016). arXiv:1504.00067
4. M. Cobo, R. Gutiérrez, **A. Maass**, Wandering intervals in self-similar interval exchange maps: the cubic Arnoux-Yoccoz example. Accepted Ergodic Theory and Dynamical Systems (2016).
5. S. Donoso, F. Durand, **A. Maass**, S. Petite, On automorphism groups of low complexity minimal subshifts. Ergodic Theory and Dynamical Systems 36 (01) (2016) 64–95.
6. B. Host, B. Kra, **A. Maass**, Variations on topological recurrence. Monatshefte für Mathematik 179 (1) (2016) 57–89.
7. F. Durand, A. Frank, **A. Maass**, Eigenvalues of Toeplitz minimal systems of finite topological rank. Ergodic Theory and Dynamical Systems 35 (8) (2015) 2499–2528.
8. B. Host, B. Kra, **A. Maass**, Complexity of nilsystems and systems lacking nilfactors. Journale d’Analyse Mathématique 124 (1) (2014) 261–295.
9. P. Dong, S. Donoso, **A. Maass**, S. Shao, X. Ye, Infinite-step nilsystems, independence and complexity. Ergodic Theory and Dynamical Systems 33 (1) (2013) 118–143.
10. B. Host, B. Kra, **A. Maass**, Nilsequences and a structure theorem for topological dynamical systems. Advances in Mathematics 224 (1) (2010) 103-129.
11. X. Bressaud, F. Durand, **A. Maass**, Continuous and measurable eigenvalues of finite rank Bratteli-Vershik dynamical systems. Ergodic Theory and Dynamical Systems 30 (3) (2010) 639664.
12. X. Bressaud, P. Hubert, **A. Maass**, Persistence of wandering intervals in self-similar affine interval exchange transformations. Ergodic Theory and Dynamical Systems 30 (3) (2010) 665686.
13. A. Coronel, **A. Maass**, S. Shao, Sequence entropy and rigid σ -algebras. Studia Mathematica 194 (2009) 207-230.
14. T. Downarowicz, **A. Maass**, Smooth interval maps have symbolic extensions. Inventiones Mathematicae 176 (3) (2009) 617-636.
15. T. Downarowicz, **A. Maass**, Finite rank Bratteli-Vershik diagrams are expansive. Ergodic Theory and Dynamical Systems 28 (3) (2008) 739-747.
16. B. Host, **A. Maass**, Nilsystèmes d’ordre deux et parallélépipèdes. Bulletin de la Société Mathématique de France 135 (1) (2007) 367-405.
17. **A. Maass**, S. Shao, Structure of bounded sequence entropy systems and sequence entropy tuples. Journal of the London Mathematical Society 76 (3) (2007) 702-718.

18. M.I. Cortez, J.M. Gambaudo, **A. Maass**, Rotation topological factors of minimal \mathbb{Z}^d -actions on the Cantor set. *Transactions American Mathematical Society* 359 (2007) 2305-2315.
19. V. Acuña, G. Didier, **A. Maass**, Coding with variable block maps. *Theoretical Computer Sciences* 369 (2006) 396-405.
20. **A. Maass**, S. Martínez, M. Sobotka, Limit measures for affine cellular automata on topological Markov subgroups. *Nonlinearity* 19 (9) (2006) 2137-2147.
21. **A. Maass**, S. Martínez, M. Pivato, R. Yassawi, Asymptotic randomization of subgroup shifts by linear cellular automata. *Ergodic Theory and Dynamical Systems* 26 (2006) 1203-1224.
22. X. Bressaud, **A. Maass**, S. Martínez, J. San Martín, Stationary processes whose filtrations are standard. *Annals of Probability* 34 (4) (2006) 1589-1600.
23. X. Bressaud, F. Durand, **A. Maass**, Necessary and sufficient conditions to be an eigenvalue for linearly recurrent dynamical Cantor systems. *Journal of the London Mathematical Society* 72 (3) (2005) 799-816.
24. W. Huang, **A. Maass**, X. Ye, Sequence entropy pairs for a measure. *Annales de l'Institut Fourier* 54 (4) (2004) 1007-1030.
25. W. Huang, **A. Maass**, P.-P. Romagnoli, X. Ye, Entropy pairs and a local Abramov formula for the entropy of open covers. *Ergodic Theory and Dynamical Systems* 24 (2004) 1127-1153.
26. F. Blanchard, F. Durand, **A. Maass**, Substitution minimal systems and other examples with countable scrambled sets. *Nonlinearity* 17 (2004) 817-833.
27. B. Host, **A. Maass**, S. Martínez, Uniform Bernoulli measure in dynamics of permutative cellular automata with algebraic local rules. *Discrete and Continuous Dynamical Systems* 9 (6) (2003) 1423-1446.
28. P. Dartnell, **A. Maass**, F. Schwartz, Combinatorial constructions associated to the dynamics of onesided cellular automata. *Theoretical Computer Science* 304 (2003) 485-497.
29. M.I. Cortez, F. Durand, B. Host, **A. Maass**, Continuous and Measurable Eigenfunctions of Linearly Recurrent Dynamical Systems. *Journal of London Mathematical Society* 67 (3) (2003) 790-804.
30. F. Durand, **A. Maass**, A note on limit laws for minimal Cantor systems with infinite periodic spectrum. *Discrete and Continuous Dynamical Systems* 9 (3) (2003) 745-750.
31. F. Blanchard, E. Glasner, S. Kolyada, **A. Maass**, On Li–Yorke Pairs. *Journal für die reine und angewandte Mathematik* 547 (2002) 51-68.

32. P. Kůrka, **A. Maass**, Stability of Subshifts in cellular automata. *Fundamenta Informaticae* 52 (1-3) (2002) 143-155.
33. F. Durand, **A. Maass**, Limit laws of entrance times for low complexity dynamical systems. *Nonlinearity* 14 (4) (2001) 683-700.
34. P. Kůrka, **A. Maass**, Limit sets of cellular automata associated to probability measures. *Journal of Statistical Physics* 100 (5/6) (2000) 1031-1047.
35. F. Durand, P. Dartnell, **A. Maass**, Orbit and Kakutani equivalence with Sturmian subshifts. *Studia Mathematica* 142 (1) (2000) 25-45.
36. V. Afraimovich, **A. Maass**, J. Urías, Symbolic dynamics for sticky sets in Hamiltonian systems. *Nonlinearity* 13 (2000) 617-637.
37. M. Boyle, **A. Maass**, Expansive invertible one sided cellular automata. *Journal of Mathematical Society of Japan* 52 (4) (2000) 725-740.
38. P. Ferrari, **A. Maass**, S. Martínez, P. Ney, Cesàro mean distribution of group automata starting from measures with summable decay. *Ergodic Theory and Dynamical Systems* 20 (2000) 1657-1670.
39. F. Blanchard, B. Host, **A. Maass**, Topological Complexity. *Ergodic Theory and Dynamical Systems* 20 (2000) 641-662.
40. **A. Maass**, P. Kurka, Realtime Subshifts. *Theoretical Computer Science* 237 (1-2) (2000) 307-325.
41. **A. Maass**, S. Martínez, On Cesàro Limit Distribution of Permutative Cellular Automata. *Journal of Statistical Physics* 90 (1998) 435-452.
42. **A. Maass**, S. Martínez, Coding nested mixing one-sided subshifts of finite type as Markov shifts having exactly the same alphabet. *Proceedings of AMS* 126 (1998) 1219-1230.
43. F. Blanchard, P. Kůrka, **A. Maass**, Topological and measure-theoretic properties of one-dimensional cellular automata. *Physica D* 103 (1997) 86-99.
44. F. Blanchard, **A. Maass**, Dynamical properties of expansive one-sided cellular automata. *Israel Journal of Mathematics* 99 (1997) 149-174.
45. F. Blanchard, **A. Maass**, Dynamical Behavior of Coven's aperiodic cellular automata. *Theoretical Computer Science* 163 (1996) 291-302.
46. F. Blanchard, B. Host, **A. Maass**, Représentation par automate des fonctions continues du tore. *Journal de Theorie des Nombres de Bordeaux* 8 (1996) 205-214.
47. F. Blanchard, B. Host, **A. Maass**, S. Martínez, D. Rudolph, Entropy pairs for a measure. *Ergodic Theory and Dynamical Systems* 15 (1995) 621-632.

48. **A. Maass**, On the Sofic limit sets of cellular automata. *Ergodic Theory and Dynamical Systems* 15 (1995) 663-684.
49. E. Goles, **A. Maass**, S. Martínez, On the limit set of some universal cellular automata. *Theoretical Computer Science* 110 (1993) 53-78.
50. **A. Maass**, Universal Cellular Automaton Simulating Any Programmable Machine. *Revista de Matemáticas Aplicadas* 12 (1991) 107-126.

Articles in chapters of books or conference proceedings

51. **A. Maass**, Rigidity results in cellular automata theory: probabilistic and ergodic theory approach. *The Pyrenees International Workshop and Summer School on Statistics, Probability and Operations Research SPO 2009*, 3956, Monogr. Mat. García Galdeano, 36, Prensas Univ. Zaragoza, Zaragoza, 2010.
52. **A. Maass**, S. Martínez, M. Pivato, R. Yassawi, Attractiveness of the Haar measure for linear cellular automata on Markov subgroups. *Dynamics and Stochastics: Festschrift in honour of Michael Keane*, Lecture Notes Monograph Series of the Institute for Mathematical Statistics, Vol. 48 (2006) 100-108.
53. P. Kůrka, **A. Maass**, Recurrence dimension in Toeplitz subshifts. *Dynamical systems (Luminy-Marseille, 1998)*, 165–175, World Sci. Publ., River Edge, NJ, 2000.
54. **A. Maass**, S. Martínez, Time averages for some classes of expansive cellular automata, *Nonlinear phenomena and Complex Systems, Cellular Automata and Complex Systems*, Kluwer Academic Publishers, Vol.3, 37–54 (1999).
55. **A. Maass**, Some dynamical properties of one–dimensional cellular automata, *Nonlinear phenomena and Complex Systems, Dynamics of Complex Interacting Systems*, Kluwer Academic Publishers, Vol.1, 35-80 (1996).
56. F. Blanchard, **A. Maass**, On dynamical properties of generalized toggle automata, *Lecture Notes in Computer Science* 911 (1995) 84-98.
57. **A. Maass**, Some Coded Systems that are not unstable limit sets of CA, *Cellular Automata and Cooperative Systems, NATO–ASI series*, Kluwer Ac. Publ. 396 (1993) 433-449.

Articles in mathematical biology and bioinformatics

Articles accepted or submitted to journals

1. The FAASG Consortium: D.J. Macqueen, C.R. Primmer, R.D. Houston, B.F. Nowak, L. Bernatchez, S. Bergseth, W.S. Davidson, C. Gallardo-Escárate, T. Goldammer, Y. Guiguen, P. Iturra, J.W. Kijas, B.F. Koop, S. Lien, **A. Maass**, S.A.M. Martin, P. McGinnity, M. Montecino, K.A. Naish, K.M. Nichols, K. Ólafsson, S.W. Omholt, Y.

- Palti, G.S. Plastow, C.E. Rexroad, M.L. Rise, R.J. Ritchie, S.R. Sandve, P.M. Schulte, A. Tello, R. Vidal, J. Olav Vik, A. Wargelius, J.M. Yáñez, Functional Analysis of All Salmonid Genomes (FAASG): an international initiative supporting future salmonid research, conservation and aquaculture. Submitted 2017.
2. N. Loira, S. Mendoza, M.P. Cortés, D. Travisany, A. Di Genova, N. Gajardo, N. Ehrenfeld, **A. Maass**, Reconstruction of the microalga *Nannochloropsis salina* genome-scale metabolic model with applications to lipid production. Submitted 2017.
 3. D. Mandakovic, C. Rojas, J. Maldonado, M. Latorre, D. Travisany, E. Delage, A. Bihouée, G. Jean, F. P. Díaz, B. Fernández-Gómez, P. Cabrera, A. Gaete, H. Pal-Gabor, C. Latorre, R. Gutiérrez, **A. Maass**, V. Cambiazo, S.A. Navarrete, D. Eveillard, M. González, Structure and co-occurrence patterns in microbial communities under acute environmental stress: untangling ecological factors fostering resilience. Submitted 2017.
 4. D. Díaz, M.E López, A. Di Genova, M. Latorre, J.M Yáñez, **A. Maass**, Characterization of Runs of Homozygosity in farmed Atlantic salmon from European and North American origin. Submitted 2017.
 5. W. Mardones, A. Di Genova, M.P. Cortés, D. Travisany, E. Callegari, **A. Maass**, J. Eyzaguirre, The genome sequence of the soft-rot fungus *Penicillium purpurogenum* reveals a high gene dosage for lignocellulolytic enzymes. Submitted 2017.
 6. R.A. Verdugo, A. Di Genova, L. Herrera, M. Moraga, M. Acuña, S. Berríos, E. Llop, C. Valenzuela, M.L. Bustamante, D. Digman, A. Symon, S. Asenjo, P. Pezo-Valderrana, P. López, A. Blanco, J. Suazo, F. Caba, E. Barozet, M. Villalón, S. Alvarado, D. Cáceres, K. Salgado, P. Portales, A.M. Naranjo, A. Moreno-Estrada, C.R. Gignoux, C.D. Bustamante, C. Eng, S. Huntsman, E.G. Burchard, N. Loira, **A. Maass**, L. Cifuentes, Whole-genome sequencing reveals large diversity in the Amerindian components of modern Chileans ChileGenómico Project. Submitted 2017.
 7. E. A. Vidal, T. Moyano, B. Bustos, E. Pérez-Palma, C. Moraga, A. Montecinos, L. Azócar, D. Soto, E. Riveras, M. Vidal, A. Di Genova, K. Puschel, P. Nurnberg, S. Buch, J. Hampe, M. Allende, V. Cambiazo, M. González, C. Hodar, M. Montecino, C. Muñoz, A. Orellana, A. Reyes-Jara, D. Travisany, P. Vizoso, M. Moraga, S. Eyheramendy, **A. Maass**, G. V. De Ferrari, J. F. Miquel, R. A. Gutiérrez, Whole Genome Sequence of Mapuche-Huilliche Native Americans. Submitted 2017.
 8. R. Assar, J. Fernández, **A. Maass**, E. Kofman, M. Montecino, Modeling and simulation of proliferating cells dynamics with asymmetric epigenetic inheritance. Submitted 2017.
 9. L. Pastenes, C. Valdivieso, A. Di Genova, D. Travisany, A. Hart, M. Montecino, A. Orellana, M. González, R. A. Gutiérrez, M. L. Allende, **A. Maass**, M. A. Méndez, Global gene expression analysis provides insight into local adaptation to geothermal streams in tadpoles of the Andean toad *Rhinella spinulosa*. Accepted Scientific Reports 2017.

10. K. Correa, J. P. Lhorente, L. Bassinic, M. E. López, A. Di Genova, **A. Maass**, W. S. Davidson, J. M. Yáñez, Genome wide association study for resistance to *Caligus rogercresseyi* in Atlantic salmon (*Salmo salar* L.) using a 50K SNP genotyping array. Accepted Aquaculture 2016.
11. S. DebRoy, M. Saldana, D. Travisany, A. Montano, J. Galloway-Pena, N. Horstmann, H. Yao, M. González, **A. Maass**, M. Latorre, S. Shelburne, A Multi-Serotype Approach Clarifies the Catabolite Control protein A Regulon in the Major 2 Human Pathogen Group A *Streptococcus*. Scientific Reports 6 (2016) 32442.
12. J.M. Yáñez, S. Naswa, M.E. López, L. Bassini, K. Correa, J. Gilbey, L. Bernatchez, A. Norris, R. Neira, J.P. Lhorente, P.S. Schnable, S. Newman, A. Mileham, N. Deeb, A. Di Genova, **A. Maass**, High-throughput single nucleotide polymorphism (SNP) discovery in Atlantic salmon (*Salmo salar*): validation in farmed and wild American and European populations. Molecular Ecology Resources 16 (2016) 1002-1011.
13. M. Latorrea, M. P. Cortés, D. Travisany, A. Di Genova, M. Budinich, A. Reyes, C. Hödar, M. González, P. Parada, R. A. Bobadilla-Fazzini, V. Cambiazo, **A. Maass**, The bioleaching potential of a bacterial extremophile consortium. Bioresource Technology 218 (2016) 659-666.
14. S. Lien, B. F. Koop, S. R. Sandve, J. R. Miller, M. P. Kent, T. Nome, T. R. Hvidsten, J. Leong, D. Minkley, A. Zimin, F. Grammes, H. Grove, A. Gjuvslund, B. Walenz, R. A. Hermansen, K. von Schalburg, E. B. Rondeau, A. Di Genova, J. K. A. Samy, J. O. Vik, M. D. Vigeland, L. Caler, U. Grimholt, S. Jentoft, D. I. Vage, P. de Jong, T. Moen, M. Baranski, Y. Palti, D. R. Smith, J. A. Yorke, A. J. Nederbragt, A. Tooming-Klunderud, K. S. Jakobsen, X. Jiang, D. Fan, Y. Hu, D. A. Liberles, R. Vidal, P. Iturra, S. J.M. Jones, I. Jonassen, **A. Maass**, S. W. Omholt, W. S. Davidson, Atlantic salmon genome provides insights into rediploidization. Nature 533 (2016) 200205.
15. C. Muñoz-Espinoza, A. Di Genova, J. Correa, R. Silva, **A. Maass**, M. González-Agüero, A. Orellana, P. Hinrichsen, Transcriptomic profiling of grapevine genotypes in early stages of berry development reveals candidate markers associated to berry weight. BMC Plant Biology 16 (2016) 104.
16. C. Álvarez, A. Aravena, T. Tapia, E. Rozenblum, L. M. Solís, A. Corvalán, M. Camus, M. Alvarez, D. Munroe, **A. Maass**, P. Carvallo, Different Array CGH profiles within hereditary FFPE breast cancer tumors associated to BRCA1 expression and overall survival. BMC-Cancer 16 (1) (2016) 219.
17. P. Bordron, M. Latorre, M.P. Cortés, M. González, A. Siegel, **A. Maass**, D. Eveillard, Putative bacterial interactions from metagenomics knowledge with an integrative systems ecology approach. Microbiology Open 5 (1) (2016) 106–117.
18. V. Acuña, A. Aravena, C. Guziolowski, D. Eveillard, A. Siegel, **A. Maass**, Deciphering transcriptional regulations coordinating the response to environmental changes. BMC-Bioinformatics 17 (2016) 1–12.

19. M. Latorre, N. Ehrenfeld, M. P. Cortés, D. Travisany, M. Budinich, A. Aravena, M. González, R. A. Bobadilla-Fazzini, P. Parada, **A. Maass**, Global transcriptional responses of *Acidithiobacillus ferrooxidans* Wenelen under different sulfide minerals. *Bioresource Technology* 200 (2016) 29–34.
20. K. Correa, J. P. Lhorente, M. E. López, L. Bassini, S. Naswa, N. Deeb, A. di Genova, **A. Maass**, W. S. Davidson, J. M. Yáñez, Genome-wide association analysis reveals genetic architecture of the resistance to *Piscirickettsia salmonis* in Atlantic salmon (*Salmo salar* L.). *BMC-Genomics* 16 (2015) 854.
21. R. Pulgar, D. Travisany, A. Zuñiga, M. González, **A. Maass**, V. Cambiazo, Complete genome sequence of the fish pathogen *Piscirickettsia salmonis* LF-89 (ATCC VR-1361). *Journal of Biotechnology* 212 (2015) 30–31.
22. Damian Smedley et al., The BioMart Community Portal: an innovative alternative to large, centralized data repositories. *Nucleic Acid Research* 43 (1) (2015) 589–598.
23. R. Pulgar, C. Hödar, D. Travisany, A. Zuñiga, C. Domínguez, **A. Maass**, M. González, V. Cambiazo, Transcriptional response of Atlantic salmon families to *Piscirickettsia salmonis* infection highlights the relevance of the iron-deprivation defence system. *BMC Genomics* 16 (2015) 495.
24. M. Zhao, C. Andrieu-Soler, L. Kowalczyk, M.P. Cortés, M. Berdugo, M. Dernighogossian, J.C. Jeanny, B. Goldenberg, M. Savoldelli, M. El Sanharawi, M.C. Naud, W.F. van Ijcken, R. Pescini-Gobert, D. Martinet, **A. Maass**, J. Wijnholds, P. Crisanti, C. Rivolta, F. Behar-Cohen, A new CRB1 rat mutation links Müller glial cells to retinal telangiectasia. *The Journal of Neuroscience* 35 (15) (2015) 6093–6106.
25. W. Huang, C. Ojaimia, J. T. Fallona, D. Travisany, **A. Maass**, L. Ivanova, A. Tomova, D. González-Acuña, H. P. Godfrey, F. C. Cabello, Genome Sequence of *Borrelia chilensis* VA1, a South American member of the Lyme Borreliosis Group. *Genome announcements of the ASM* 3 (2015) e01535-14.
26. M. J. Arismendi, R. Almada, P. Pimentel, P. Hinrichsen, M. Pinto, A. Di Genova, D. Travisany, **A. Maass**, B. Sagredo, Characterization of root transcriptome dynamics in *Prunus sp.* rootstocks with contrasting response to hypoxia. *Tree Genome and Genetics* 11 (2015) 1–16.
27. R. A. Bobadilla-Fazzini, M. P. Cortés, **A. Maass**, P. Parada, *Sulfobacillus thermosulfidooxidans* strain Cutipay enhances chalcopyrite bioleaching under moderate thermophilic conditions in the presence of chloride ion. *AMB Express* 4 (2014) 84–88.
28. D. Travisany, M. P. Cortés, M. Latorre, A. Di Genova, M. Budinich, R. A. Bobadilla-Fazzini, P. Parada, M. González, **A. Maass**, A new genome of *Acidithiobacillus thiooxidans* provides insights into adaptation to bioleaching environment. *Research in Microbiology* 165 (9) (2014) 743–752.

29. F. Abarca, P. Parada, P. Martínez, **A. Maass**, T. Pérez-Acle, Structure prediction and stability analysis of Licanantase: a trimeric acid-stable coiled-coil lipoprotein from *Acidithiobacillus thiooxidans*. *PeerJ* (2014) 2:e457.
30. R. Assar, **A. Maass**, M.A. Montecino, D.J. Sherman, Describing acclimatization by hybrid systems and reconciliation: condition changes alter biological system behavior models. *Biosystems* 121 (2014) 43–53.
31. T. Downarowicz, D. Travisany, M. Montecino, **A. Maass**, Symbolic extensions applied to multiscale structure of genomes. *Acta Biotheoretica* 62 (2) (2014) 145–169.
32. M. Latorre, J. Galloway-Peña, J. Hyeob Roh, M. Budinich, A. Reyes-Jara, B. E. Murray, **A. Maass**, M. González, *Enterococcus faecalis* reconfigures its gene regulatory network activation under copper exposure. *Metallomics* 6 (2014) 572–581.
33. A. Di Genova, A. Miyasaka, P. Vizoso, D. Travisany, C. Moraga, C. Muñoz, M. Pinto, P. Hinrichsen, A. Orellana, **A. Maass**, Whole genome comparison between table and wine grapes reveals a comprehensive catalog of structural variants. *BMC Biology* 14 (1) (2014) 7–20.
34. C. Hodar, A. Zuñiga, R. Pulgar, D. Travisany, C. Chacón, M. Pino, **A. Maass**, V Cambiazo, Comparative gene expression analysis of *Dtg*, a novel target of the *Dpp* signaling pathway in the early *Drosophila melanogaster* embryo. *Gene* 535 (2) (2014) 210-217.
35. M. González-Aguero, M. García-Rojas, A. Di Genova, J. Correa, **A. Maass**, A. Orellana, P. Hinrichsen. Identification of two putative reference genes from grapevine suitable for gene expression analysis in berry and related tissues derived from RNA-Seq data. *BMC-Genomics* 14 (1) (2013) 878–889.
36. S. Kumar Sharma, ..., A. Di Genova, ..., **A. Maass**, ..., G. J. Bryan, Construction of reference chromosome-scale pseudomolecules for potato: Integrating the potato genome with genetic and physical maps. *Accepted G3-Genes, Genomes and Genetics* 3 (11) (2013) 2031–2047.
37. R. Bobadilla-Fazzini, M. P. Cortés, L. Padilla, D. Maturana, M. Budinich, **A. Maass**, P. Parada, Stoichiometric Modeling of Oxidation of Reduced Inorganic Sulfur Compounds (RISCs) in *Acidithiobacillus thiooxidans*. *Biotechnology and Bioengineering* 110 (8) (2013) 2242-2251.
38. E. Utreras, D. Henríquez, E. Contreras-Vallejos, C. Olmos, A. Di Genova, **A. Maass**, A.B. Kulkarni, Ch. González-Billault, CDK5 regulates RAP1 activity. *Neurochem. Int.* 62 (6) (2013) 848-853.
39. D.A. Bórquez, C. Olmos, S. Alvarez, A. Di Genova, **A. Maass**, C. González-Billault, Bioinformatic survey for new physiological substrates of Cyclin-dependent kinase 5. *Genomics* 101 (4) (2013) 221-228.

40. P. Martínez, S. Gálvez, N. Ohtsuka, M. Budinich, M.P. Cortés, C. Serpell, K. Nakahigashi, A. Hirayama, M. Tomita, T. Soga, S. Martínez, **A. Maass**, P. Parada, Metabolomic study of Chilean biomining bacteria *Acidithiobacillus ferrooxidans* strain Wenelen and *Acidithiobacillus thiooxidans* strain Licanantay. *Metabolomics* 9 (1) (2013) 247–257.
41. D. Travisany, A. Di Genova, A. Sepúlveda, R. Bobadilla, P. Parada, **A. Maass**, Draft genome sequence of *Sulfobacillus thermosulfidooxidans* Cutipay strain, indigenous bacteria isolated from naturally extreme mining environment in the north of Chile. *Journal of Bacteriology* 194 (22) (2012) 6327-6328.
42. C. Hodar, P. Moreno, A. di Genova, M. Latorre, A. Reyes-Jara, **A. Maass**, M. González, V. Cambiazo, Genome wide identification of *A. ferrooxidans* (ATCC 23270) transcription factors and comparative analysis of ArsR and MerR metal regulators. *Biometals* 25 (2012) 75-93.
43. A. Di Genova, A. Aravena, Luis Zapata, **A. Maass**, M. González, P. Iturra, SalmonDB: A bioinformatics resource for *Salmo salar* and *Oncorhynchus mykiss*. *Database: The Journal of Biological Databases and Curation* (2011), doi: 10.1093/database/bar050.
44. W. Davidson, B. Koop, S. Jones, P. Iturra, R. Vidal, **A. Maass**, I. Jonassen, S. Lien, S. Omholt, Sequencing the genome of the Atlantic salmon (*Salmo salar*). *Genome Biology* (2010) 11: 403.
45. C. Hodar, R. Assar, M. Colombres, A. Aravena, L. Pavez, M. González, S. Martínez, N. C. Inestrosa, **A. Maass**, Genome-wide identification of new Wnt/ β -catenin target genes in the human genome using CART method. *BMC Genomics* (2010) 11:348.
46. J. Briche, Y. Lacroix, **A. Maass**, Adaptation d'un algorithme génétique pour la reconstruction de réseaux de régulation génétique: COGARE. *Revue d'Intelligence Artificielle* 24 (2010) 7-26.
47. M. Arrázola, L. Varela-Nallar, M. Colombres, R. Assar, A. Aravena, **A. Maass**, S. Martínez, N. C. Inestrosa, Calcium /calmodulin-dependent protein kinase type IV (CaMKIV) is a target gene of the Wnt/ β -catenin signaling pathway. *Journal of Cellular Physiology* 221 (2009) 658-667.
48. N. Ehrenfeld, A. Aravena, A. Reyes-Jara, N. Barreto, R. Assar, **A. Maass**, P. Parada, Design and use of oligonucleotide microarrays for identification of Biomining microorganisms. *Advanced Materials Research* 71-73 (2009) 155-158.
49. G. Levicán, J. A. Ugalde, N. Ehrenfeld, **A. Maass**, P. Parada, Comparative genomic analysis of carbon and nitrogen assimilation mechanisms in three indigenous bioleaching bacteria: predictions and validations. *BMC-Genomics* 9 (2008) 581.
50. R. Uauy, **A. Maass**, M. Araya, Estimating risk from copper excess in human populations. *The American Journal of Clinical Nutrition* 88 (2008) 867S-871S.

51. M. González, A. Reyes, M. Suazo, T. del Pozo, C. Hodar, E. Pécou, **A. Maass**, Cellular metabolism of copper in pro- and eukaryotes: Comparative analysis of their transcriptional regulation mechanisms. *Placenta* 27 (1) (2006) 29-29.
52. E. Pécou, **A. Maass**, D. Remenik, J. Briche, M. González, A Mathematical model for copper homeostasis in *Enterococcus hirae*. *Mathematical Bioscience* 203 (2) (2006) 222-239.
53. **A. Maass**, A. Moreira, TIP: Protein Backtranslation Aided by Genetic Algorithms. *Bioinformatics* 20 (13) (2004) 2148-2149.
54. **A. Maass**, S. Martínez, Evolution of probability measures by cellular automata on algebraic topological Markov chains. *Biological Research* 36 (2003) 107-112.

Articles in chapters of books or conference proceedings

55. D. Travisany, D. Galarce, **A. Maass**, R. Assar, Predicting the metagenomic content with multiple CART trees. *Mathematical Models in Biology - Bringing Math to Life*, Springer Proceedings, 145-160 (2014).
56. R. Assar, **A. Maass**, J. Fernández, E. Kofman, and M. A. Montecino, Modeling cell decisions in bone formation. In *Analysis, Modelling, Optimization, and Numerical Techniques*, G. O. Tost and O. Vasilieva, Eds. Springer International Publishing, pp. 235245 (2015). (ISI Proceedings)
57. V. Acuña, A. Aravena, **A. Maass**, A. Siegel, Modeling parsimonious putative regulatory networks: complexity and heuristic approaches. 15th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI) January 19–21, 2014, San Diego, USA. *Lecture Notes in Computer Science* 8318, 322–336 (2014). (ISI Proceedings)
58. P. Bordron, D. Eveillard, **A. Maass**, A. Siegel, S. Thiele, An ASP application in integrative biology: identification of functional gene units. 12th International Conference on Logic Programming and Nonmonotonic Reasoning – LPNMR 2013. *Lecture Notes in Computer Science series* 8148, 206–218 (2013). (ISI Proceedings)

Edition of Books

1. N. Fatès, E. Goles, **A. Maass**, I. Rapaport. Automata 2011–17th International Workshop on Cellular Automata and Discrete Complex Systems. *Discrete Mathematics & Theoretical Computer Science Proceedings (DMTCS)*, 2012.
2. **A. Maass**, S. Martínez, J. San Martín. *Information and Randomness*. Collection Travaux en Cours 66, Hermann Editeurs, Paris, 2006.
3. **A. Maass**, E. Pécou, Sa. Martínez. *Mathematical and Computational Methods in Biology*. Collection Travaux en Cours 65, Hermann Editeurs, Paris, 2005.

4. **A. Maass**, S. Martínez, J. San Martín. Dynamics and Randomness II. Non-Linear Phenomena and Complex Systems, Volume 8, Kluwer Academic Publishers, 2004.
5. **A. Maass**, S. Martínez, J. San Martín. Dynamics and Randomness. Non-Linear Phenomena and Complex Systems, Volume 7, Kluwer Academic Publishers, 2002.
6. F. Blanchard, **A. Maass**, A. Nogueira. Topics in Symbolic Dynamics and Applications. London Mathematical Society, Lecture Notes Series 279, Cambridge University Press, 2000.

Patents

1. **A. Maass**, A. Aravena, M. González, S. Martínez, P. Parada, K. Ehrenfeld, Method for the design of oligonucleotides for molecular biology techniques.
 - USA, Number: US 7 853 408 B2, Date: 14/12/2010;
 - South Africa, Number: 2006/06828, Date: 26/03/2008;
 - Australia, Number: 2006203551, Date: 15/09/2011;
 - Mexico, Number: PXXM 32/2006, Date: November 2012.
2. R. Badilla, **A. Maass**, P. Parada, A. Aravena, P. Moreno, S. Martínez, K. Ehrenfeld, Arrangement of DNA fragments array from biomining microorganisms and method for the detection of them.
 - USA, Number US 7 915 031 B2, Date: 29/03/2011.
 - South Africa, Number: ZA 2006/09650, Date: 27/12/2007;
 - Argentina, Number: AR 06 01 05103, Date: 09/09/2010;
 - Peru, Number: PE 5838, Date: 29/10/2010;
 - Australia, Number: AU 2006 241345, Date: 2013;
 - Mexico, Number: MX 307,357, Date: 2013.
 - Pending in Chile, Number: 200503033, Date: 21/11/2005.
3. K.Ehrenfeld, J. Ugalde, A. Aravena, N. Loira, **A. Maass**, P. Parada, Array of nucleotide sequences for the detection and identification of genes that codify proteins with activities relevant in biotechnology present in a microbiological sample, and method for using this array.
 - USA, Number: US 8 207 324 B2, Date: 26/06/2012.
 - South Africa, Number: ZA 2008 02344, Date: 26/11/2008;
 - Chine, Number: 200810095172.6, Date: 2013;
 - Chile, Number: DPI-660-2007, Date: 06/05/2013;

- Peru, Number: PE 6669, Date: 2013;
 - Mexico, Number: MX 298861, Date: 2013.
4. P. Parada, K. Ehrenfeld, I. Pacheco, **A. Maass**, A. Aravena, M. González, S. Martínez, Method for the identification and quantification of microorganisms useful in biomining processes.
 - USA, Number: US 8 492 093 B2, Date: 23/07/2013
 - Chile, Number: 46,739, Date: 31/08/2010;
 - South Africa, Number: 2006/07131, Date: 30/05/2007;
 - Australia, Number: AU 2006204629, Date: 27/09/2012;
 - Mexico, Number: MX 307267.
 5. M. Barreto, M. Budinich, **A. Maass**, P. Moreno, L. Padilla, P. Parada, Method to increase the production of extracellular polymeric substances (EPS) in a *Acidithiobacillus ferrooxidans* culture by the inhibition of enzymes of tricarboxilic acid cycle.
 - USA, Number: US 8 927 246 B2 , Date: 6/01/2015;
 - South Africa, Number: 2011/01564, Date: 02/12/2011;
 - Chile, Number: PAT 1853/2009, Date: 01/03/2013.
 6. R. Pulgar, C. Hodar, A. Aravena, R. Neira, A. *Maass*, V. Cambiazo, Arreglo de secuencias nucleotídicas para la detección e identificación de transcritos vinculados con la resistencia o susceptibilidad de *Salmo salar* a una infección con *Piscirickettsia salmonis*.
 - Pending in Chile, Number: 201202773, Date: October 2012.

Organization of International Conferences and Schools

1. CIMPA–UNESCO Summer School on Symbolic Dynamics and Applications, Temuco, Chile, January 1997.
2. Workshop on Dynamics and Randomness, Santiago, Chile, December 2000.
3. Workshop on Dynamics and Randomness II, Santiago, Chile, December 2002.
4. CIMPA Summer School on Mathematical and Computational Methods in Biology, Valdivia, Chile, January 2004.
5. Workshop on Information and Randomness, Santiago, Chile, December 2004.
6. III Chilean Workshop on Bioinformatics, Santiago, Chile, September 2005.
7. Workshop on Information and Randomness, Santiago, Chile, December 2006.

8. School on Information and Randomness, Santiago, Chile, December 2008.
9. Journée on Mathematical Modeling in Geobiometallurgy, Santiago, Chile, October 2009.
10. School on Information and Randomness, Pucón, Chile, December 2010.
11. Bioinformatics Workshop on Metabolomics Analysis of Massive Data Sets, Santiago, Chile, September 2011.
12. AUTOMATA 2011, 17th International Workshop on Cellular Automata and Discrete Complex Systems, Santiago, Chile, November 2011.
13. Premier Congrès Franco-Chilien en Dynamique et Combinatoire, Cap Hornu, Baie de Somme, France, January 2012.
14. ICGEB-Chile Theoretical and Practical Course Advances in Bioinformatics Tools for the Analysis of High-throughput Omics Data, Santiago, Chile, July 2012.
15. School on Information and Randomness, Puerto Varas, Chile, December 2012.
16. SubTile 2013 “Pavages : systèmes dynamiques, combinatoire, théorie des nombres, décidabilité, géométrie discrète, géométrie non-commutative”, Marseille, France, January 2013.
17. Workshop on Integrative Omics, Pucón, Chile, December 2013.
18. School on Information and Randomness, Puerto Varas, Chile, December 2014.
19. Workshop i-Plant Chile, Santiago, Chile, December 2015.
20. 3rd International Conference on Integrative Salmonid Biology, Puerto Varas, Chile, April 2016.
21. School on Information and Randomness, Santiago, Chile, December 2016.

Invitations to International Conferences

1. I Escuela de Verano en Física Estadística y Sistemas Cooperativos, Santiago, Chile, 1988.
2. II Taller de Redes Neuronales y Autómatas, Bogotá, Colombia, 1989.
3. Workshop on Cooperative Systems and Cellular Automata, Les Houches, France, 1992.
4. Workshop on Symbolic Dynamics, MSRI (Mathematical Science Research Institute) Berkeley, 1992.
5. Workshop on Number Theory and Ergodic Theory, Math. Research Center University of Warwick, 1994.

6. Fourth School on Statistical Physics and Cooperative Systems (FIESTA 94), 1994.
7. Workshop on Symbolic Dynamics, University of Maryland at College Park, 1995.
8. Second Latin American Symposium (LATIN'95), Chile, 1995.
9. Workshop on Lattice Dynamics, Université de Paris VI, 1995.
10. Workshop on Ergodic Theory, CIRM–France, 1995.
11. Fifth School on Complex Systems (FIESTA 96), 1996.
12. I Congreso Latino Americano de Matemáticos, 2000, IMPA, Brasil.
13. L'ODYSEE DYNAMIQUE, Marseille- Luminy (Centre de formation du CNRS), 2001.
14. V Joint Meeting AMS-SMM, 2001, Morelia, MEXICO.
15. AUTOMATA 2002, Eighth International Workshop on Cellular Automata, Prague, 2002.
16. Spring 2004 Maryland-Penn State Dynamics Workshop, Washington, 2004.
17. Max-Planck-Institut für Mathematik, Bonn, Germany: Algebraic and Topological Dynamics activity, 2004.
18. VIII Brazilian School of Probability, Ubatuba, 2004.
19. I Regional Meeting of Probability and Statistics ERPEN, B. Aires, 2004.
20. ICALP 2004, Turku, Finland.
21. Visegard Conference on Dynamical Systems, Prague, July 2005.
22. IV Workshop on Dynamical Systems, San Pedro de Atacama, August 2005.
23. Workshop on Ergodic Theory and Dynamical System, Poland, June 2006.
24. Aperiodic Order: new connections and old problems revisited, Marseille, France, September 2007.
25. Mathematical Sciences Research Institute, Berkeley, California: 2008. Program in Ergodic Theory and Additive Combinatorics (August 30, 2008 to November 21, 2008)
26. I Discrete Mathematics Workshop, Salta, Argentina, March 2009.
27. Workshop in “Dynamical Numbers: Interplay between Dynamical Systems and Number Theory”, Bonn, Germany, June 2009.
28. Pyrenees International Workshop on Statistics, Probability and Operations Research, SPO 09, Jaca, Spain, September 2009.

29. Math-Info 2010, Towards new interactions between mathematics and computer science, Marseille, France, February 2010 (Invited Speaker FRUMAM).
30. Workshop on Dynamical Systems and Related Topics in honor of Dan Rudolph, U. Maryland, USA, April 2010.
31. Nonlinear Dynamics: New Directions, Guanajuato, Mexico, May 2010.
32. Dynamical Systems Meeting, Lower Silesia, Poland, May 2010.
33. XIV Brazilian School of Probability and Clay Mathematical Institute Summer School, Buzios, Brazil, August 2010.
34. 13th Mons Theoretical Computer Science Days, Amiens, France, September 2010.
35. Workshop on Dynamical Systems and Related Topics with a special session in honor of Mike Boyle on his 60th birthday, U. Maryland, USA, April 2011.
36. Trends in Dynamics, Chicago, USA, April 2011.
37. International Conference on Measurable and Topological Dynamics and Related Topics, Yellow-Mountains, China, June 2011.
38. XII Latin American Workshop on Nonlinear Phenomena (LAWNP-2011), San Luis Potosí, Mexico, October 2011.
39. Ergodic Theory with Connections to Arithmetic, Heraklion, Greece, June 2013
40. Mathematical Congress of the Americas, Guanajuato, Mexico, August 2013.
41. Ergodic Theory and Dynamical Systems Conference, Torun, Poland, May 2014.
42. Workshop on Functional Analysis and Dynamical Systems, Florianópolis, Brazil, February 2015.
43. Congrès SMAI 2015, 7e Biennale Française des Mathématiques Appliquées et Industrielles, Les Karellis, Savoie, France, June 2015.
44. Combinatorics Meets Ergodic Theory, Banff International Research Station for Mathematical Innovation and Discovery, Banff, Canada, July 2015.
45. 2nd Workshop on Combinatorics, Number Theory and Dynamical Systems, IMPA, Rio de Janeiro, August 2015.
46. CIMPA School Dynamics on Cantor Sets, Salta, Argentina, November 2015.
47. Ergodic Theory and Dynamical Systems Conference (In honor of the 60th birthday of T. Downarowicz), Wrocław, Poland, May 2016.
48. The 7th Pacific RIM Conference on Mathematics, Seoul, Korea, June 2016.

49. 6th Pingree Park Dynamics Workshop, Foundations and Frontiers in Symbolic Dynamics, Pingree Park, Colorado, USA, July 17-20, 2017.

Invited Positions (longer than two weeks)

1. Institut de Mathématiques de Luminy, CNRS-France (about 15 months from 1994 to 2010).
2. University of Marne la Vallée, Paris-Est, France: 1998, 2000, 2001, 2009, 2010, 2012, 2013 (4 months, “Bézout Chair”), 2015.
3. University of Haute Picardie Jules Verne, France: 1999, 2000, 2002, 2005, 2014 (3 months, “Poste Rouge CNRS”), 2016.
4. U. Toulouse III, Paul Sabatier, France: 2012.
5. INRIA-Rennes, France: 2012, 2013, 2016.
6. University of Bourgogne, France: 2002, 2004.
7. University of Maryland at College Park, USA: 1995, 2004, 2010.
8. Northwestern University, USA: 2011, 2012, 2014, 2015.
9. Mathematical Sciences Research Institute, Berkeley, California: 2008. Program in Ergodic Theory and Additive Combinatorics (August 30, 2008 to November 21, 2008).
10. University of Science and Technology of China: 2001, 2006, 2011, 2014.
11. Max Planck Institute Bonn, Germany: 2004 and 2009 for activity “Dynamical Numbers: Interplay between Dynamical Systems and Number Theory”.
12. University Charles at Prague, Check Republic: 1997.
13. University of Sao Pablo, Brasil: 1997.
14. Instituto de Investigación en Comunicación Optica, Mexico: 1998, 2001.

Main Research Projects

Fundamental Research

1. BASAL Project “Center for Mathematical Modeling”, May 2008 to April 2018. Key Researcher.
2. FONDAP Project “Center for Genome Regulation”, January 2011 to December 2020. Key Researcher.

3. Project FONDECYT “Comparative and functional genomic analysis of the interaction between *P. salmonis* and its host-cell”, March 2016 to February 2020. Associate Researcher.
4. Project FONDECYT “Metal metabolism in soil bacterial communities from an extreme environment: a comparative genomics analysis”, March 2015 to February 2019. Associate Researcher.
5. Project FONDECYT “Gene regulatory network of iron metabolism in *E. Faecalis*: functional analysis of Fur, perR and Zur regulon”, March 2011 to February 2015. Associate Researcher.
6. Innova-Corfo project “CIRIC Innovative Center”, January 2012-December 2014. Main researcher project *Omics Integrative Science* in collaboration with Dyliss and Bamboo INRIA-France teams.
7. FONDAF Project “Center for Mathematical Modeling”, 1997-2002. Associate Researcher.
8. Project Millennium Nucleus “Information and randomness: laboratories in bioinformatics and mathematics of the genome and stochastic simulation”, 2003-2005 Associate Researcher, 2006-2008 Deputy Director.
9. Project FONDECYT “Combinatorial complexity of orbits in topological dynamical systems”, 2001-2004. Main Researcher.
10. Project FONDECYT “Cesàro Limit Distribution of Cellular Automata”, 1998-2000. Main Researcher.
11. Project FONDECYT “Topological and Symbolic Dynamics of Cellular Automata”, 1996-1997. Main Researcher.

International Cooperation

1. Project MathAmsud “Dynamics of Cantor systems: computability, combinatorial and geometric aspects”, 2017-2018. Main Researcher.
2. Project INRIA-Conicyt French Cooperation “Intégration dynamique de données grande-échelle et hétérogènes en biologie moléculaire: application à l’identification de régulateurs de la bio-lixiviation du cuivre minier”, 2011-2012. Main Researcher. Associate Research Team INRIA 2011-2013, 2014-2016.
3. Project PICS-CNRS French Cooperation “Dynamics and Combinatorics”, U. Chile-U. Picardie Jules Verne-U. Marne la Vallée, 2009-2011. Main Researcher.
4. Project CNRS-Conicyt French Cooperation “Study of linearly recurrent tilings, combinatorial and ergodic aspects”, U. Chile-U. Picardie Jules Verne-U. Marne la Vallée, 2004. Main Researcher.

5. Project ECOS-Conicyt French Cooperation “Tiling systems and standardness”, U. Chile-U. Bourgogne-Institut de Math. de Luminy-U.Picardie Jules Verne-U. Marne la Vallée, 2004-2006. Main Researcher.
6. Project ECOS-Conicyt French Cooperation “Algebraic aspects and complexity of topological dynamical systems”, U. Chile-Institut de Math. de Luminy-U.Picardie Jules Verne-U. Marne la Vallée, 2000-2002. Main Researcher.
7. Project CNRS-Conicyt French Cooperation “Discrete Dynamical Systems, Complexity and Automata”, U. Chile-Institut de Math. de Luminy, 1997-1999. Main Researcher.

Applied Research

1. Project “Sequencing and Assembly of Salmon Chinook”. Funded by Columbia River Inter-Tribal Fish Commission, 2015-2016. Directors Shawn Narum and Alejandro Maass.
2. Project “Development of an integrative strategy for the genetic improvement of the resistance against Salmon Rickettsial Syndrome (*Piscirickettsia salmonis*) in salmonid species using molecular information”. Funded by Fondef-Conicyt (Main Institutions: U. Chile-Aquainnovo), 2015-2016. Director Bioinformatics Team.
3. Project: “Development of a biotechnological platform for exporting genetic services to improve warm water aquaculture species production in America applying genomic selection”. Funded by INNOVA-Corfo (Main Institution: Aquainnovo), 2015-2016. Director Bioinformatics Team.
4. Project “Kits to detect bacterial contaminants in the wine production”. Bioinformatics part. Funded by INNOVA-Corfo (coordinated by V. Cambiazo, INTA-U. Chile), 2014-2016. Deputy Director of the project and Director Bioinformatics Team.
5. Project “Genomics of Chilean populations: genetic profiles necessary in clinic research, public health and forensic medicine”. Funded by Fondef D10I1007 (coordinated by Medical School U. Chile), 2012-2014. Director Bioinformatics Team.
6. Project “Molecular profile of breast cancer at clinical stages II and III in Latinamerican women receiving a standard reference treatment”. Funded by National Cancer Institute USA (coordinated by GOCCHI), 2012-2014. Director Bioinformatics Team.
7. Project “Application of metabolomics to the mining industry to improve processes associated with the bioleaching of mineral resources”. Funded by INNOVA-Corfo 09CN14-585 (coordinated by Biosigma S.A.), 2010-2012. Director Bioinformatics Team.
8. Project “Implementation of a database with the potato genome and transcriptomics data of genotypes DM and RH and bioinformatics analysis”. Funded by INIA, 2011. Director.

9. Project “Implementation of a platform for the bioinformatics analysis and storage of databases of genomics information coming from different vegetables of interest for the programs of genetic improvement at La Platina-INIA”. Funded by INIA, 2010. Director.
10. Project “Identification of genes related to berry development and growth in seedless table grapes by means of functional genomics”. Funded by Fondef G07I1002 (coordinated by INIA), 2008-2012. Director Bioinformatics Team.
11. Project “Salmonid genomics: identification of genes related to protein and vegetal oil usage in Atlantic salmon and rainbow trout nutrition”. Funded by INNOVA-Corfo 07CN13PBT-41 (coordinated by Medical School U. Chile), 2008-2011. Director Bioinformatics Team.
12. Project “Information biomining laboratory: organization and statistical processing of biomining data, modeling and networks”. Funded by BioSigma S.A. (joint venture Codelco/Nippon Mining & Metals). January 2003 to June 2010. Director.
13. Project “Development of a scientific-technological capacity in mathematical modeling and simulation for the control of biological networks in productive processes: application to bacterial bioleaching”. Funded by BioSigma S.A. and FONDEF D04I1257, December 2005 to August 2008. Director.
14. Project “Bioidentification system for industrial relevant microorganisms: application to avian and winery sectors”. Funded by Fundación Copec-Universidad Católica, in cooperation with Viña San Pedro, July 2007 to December 2008. Director.
15. Project “Academic industrial network for the development of applications of probability and information theory to biosciences”. Funded by Programa Bicentenario en Ciencia y Tecnología. Cooperation with “Centro para el análisis de la función génica en el desarrollo neuronal”, Fac. Medicine, U. Chile and “Centro de Regulación Celular y Patologías Joaquín V. Luco”, Facultad de Biología, P.U. Católica de Chile, March 2008-June 2009. Director.