CURRICULUM VITAE
(March 2006)

Última versión Marzo 28, 2006. 15:15 hrs.

1.- PERSONAL DATA.

Name:	Eric Antonio Goles Chacc.
Date of Birth:	August 21, 1951.
Place of Birth:	Antofagasta.
	Two children: Luciana and Nicolás.
Nationality:	Chilean citizen
Place work:	Facultad de Ciencias y Tecnología Universidad Adolfo Ibáñez Av. Diagonal las Torres 2640. Peñalolén – Santiago Teléfono Directo: 56-2-6754638 Secretaria General: 56-2-3693660 Fax: 56-2 -2784413 E.mail: eric.chacc@uai.cl Personal web page: http://www.conicyt.cl/~egoles/
Researcher:	Centre for Mathematical Modelling (since 1999 -) Blanco Encalada 2120,7° Piso FAX: 56-2-6889705 TEL.: 56-2-6784870 www.cmm.uchile.cl
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Key words:	Complexity, Computer Science, Discrete Mathematics, Mathematical Modelling.

2.- GRADUATE STUDIES.

Institution	**Date**	**Degree**
University of Chile	1970-1975	Engineer
Catholic University	1972-1973	Studies in Philosophy
University of Grenoble (France)	1977-1980	Ph.D. in Engineering (Computer Science)
University of Grenoble (France)	1985	Ph.D. in Mathematics (Docteur d'Etat)

3.- WORK POSITIONS :

Institution Charge		Charge	Date
University of Chile - Deparment Mathematic Engineering		Professor	1974 – 2006
C.N.R.S. France		Researcher	1981 – 1986
		Directeur de Recherche classe exceptionnelle (DRCE)	(2003 -)
National Center for Mathematical Modeling	Director	1997 – March 2000	
	Researcher	1997 – up today	
National Commission for Scientific and Techonological Research (CONICYT)	President	March 2000 – March 2006	
Institute for Complex Systems (Valparaíso)	Director Scientific	2003 – up day	

4.- AWARDS.

1.- Ranked number three among the accepted applicants for positions in Applied Mathematics at C.N.R.S. – France, 1980 (number one among foreign applicants).
2.- Unique Honorific of scientific prize M. Noriega Morales, O.E.A., (1986).
3.- Incorporation to the National Academy of Sciences, (1990).
4.- Prize Manuel Montt, Chile for the book Neural and Automata Networks, (1991).
5.- National Prize of Sciences, 1993.
6.- Best paper award in the International Congress Mathematics & Design, San Sebastián, Spain, (1998).
7.- Honorable Son of the City and Distinguished Citizen, Antofagasta, Chile 1999.
8.- BIOSFELLOW (member of scientific council) of Bios Group Company, Santa Fe, USA, (1999-2003).
9.- Prize "Distinguished Persons", Universidad del Pacífico, 2000.
10.- "Ordem do Rio Branco Grau de Comendador", Brasil Goverment (2002).
11.- Special Issue of the Journal Theoretical Computer Science, in to honour my 50th Birthday (several authors, preface of Dr. Maurice Nivat, French Academy of Science),vol. 32 number 2 pp. 229-422 (2004)
12.- Award to Distinguished Graduate. Commemoration of the 161st Anniversary of the University of Chile. (2003)
13.- CNRS position as DRCE (Directeur de Recherche classe exceptionnelle *(2003-)*
14.- Honored by The King of Spain.(2004)
15.- Associated Research to the ATENEO of Politechinal Institute of Torino – Italy (2004 -).
16.- Meritorious National Order Medal, in the degree of Knight (Goverment of France, July 2004)
17.- Prize Jules Verne, Unesco-CNRS, Image & Science Festival, (Paris, September 2004) (for a science open TV program in Chilean chanel TVN)
18.- Member of the ASP Scientific Committee (six members) - Alta Scuola Politecnica – ASP.(Milan, Turín, 2005).
19.- Member of the team of experts of École Polytechnique Féderale de Lausanne – EPFL's "International Sientific Advisory Board". (Lausanne, Switzerland, 2006).

5.- PARTICIPATION IN EDITORIAL BOARDS:

a. **International:**

1.- Networks, IOP Pub., England, (D. Amit, Racha Inst. - U. of Rome, editor in chief) 1990-94.
2.- Connection Science, England (stable review panel), from 1989 - 1992
3.- Theoretical Computer Science Journal, from 1994 – up today.
4.- Complexus, (S.Karger AG, Basel. Medical And Scientific Publischers). Modelling and Understanding Functional Interactions in Life Sciences. (2000 – up today).

b. **National:**

1. Revista Sigma (de Matemáticas Aplicadas), 1982-1986.
2. Notas Chilean Mathematical Soc., 1988-93.
3. Journal on Applied Mathematics, 1987-
4. Revista del Instituto de Ingenieros 1991-93.
5. Innovation, Journal of the Ministerio de Economía, Chile, 1997- 1999

6.- PUBLICATIONS:

1. Periodic bellavior of generalized threshold functions, in Discrete Math., 30, 1980 (with J. Olivos).
2. Comportement itératif des fonctions a multiseuil, in Inf. and Control, 45, 1980 (with J. Olivos).
3. Irerations des fonctions á seuil sur un graphe, in Actes Coll. Cerisy, 'Regards sur la Théorie des Graphes',Presses Pol. Romandes, 1980 (with J. Olivos).
4. Etude dynamique des certains modéles de controle génetique, in Journal de Biometrie et Génétique, J.M. Legay et. al. eds., 1980 (with Snoussi E.).
5. Comportement periodique des fonctions á seuil binaires, in Disc. Applied Maths., 3, 1981 (with J.Olivos).
6. The convergence of symmetric threshold automata, in Inf. and Control, Vol. 51, Nov. 1981 (with J.Olivos).
7. A Short proof on the cyclic behaviour of multithreshold symmmetric automata, in Inf. and Control, Vol. 51. 1981, pp. 95-97 (with S. Martínez).
8. Sequential iteration of threshold functions, numerical method in the study of critical phenomena, Deladora et. Al. eds., Springer Series in Synergetics, pp. 64-70, Springer Verlag, 1981.
9. Fixed point of threshold functions on a finite set, in SIAM Journal on Algebraic and Discrete Vol. 3. No. 4. 1982.
10. Specific roles of different Boolean mappings in random networks, in Bull. of Math. Biol., Vol. 44, 1982 (with F. Fogelman, G. Weisbuch).
11. Iterative behaviour of generalized majority functions, in Math.Social Sciences, 4, 1983 (with M.Tchuente).
12. Transsient length in sequential interations of threshold functions, in Disc. Applied Maths., 6, 1983 (with F.Fogelman, G.Weisbuch).
13. Iterative behaviour of one dimensional threshold automata, in Disc. Applied Maths., 8, 1984 (with M.Tchuente).
14. Dynamique d'un automata a mémoire modélisant le fonctionnement d'un neurone, Comptes Rendues Acad. Sciences France, t299, Série I, No. 10, 1984 (with M. Cosnard, presented by R.Thom).
15. Dynamical behavior of neural networks, in SIAM Journal on Alg.and Disc. Meths., Vol. 6, No. 4, 1985.
16. Erasing multithreshold automata in Dynamical Systems and Cellular Automata, Demongeot et. al. Eds., Acad. Press 1985. pp. 47-55 (with M. Tchuente).
17. Dynamics on positive automata networks, in Theoretical Computer Sciences, 41 pp. 19-32, 1985.
18. Comportement dynamique d'un automate á mémoire, in Actes Coll. Biol. Théorique, Solignac, Eds. CNRS. 1985 (with M. Cosnard).
19. The energy as a tool for the study of threshold networks, in Discrete Applied Maths., 12, pp 261-277,1985 (witil F. Fogelman,
20. Dynamical properties of an automaton with memory, in Procc. Of "Disordered systems and Biol. Organization" Biennestock et. al. eds. (with M. Cosil ard) NATO, ASI series in Computer and Systems Science. Vol. 20, Springer Verlag, pp. 63-66, 1986.

21. Positive automata networks, invited paper, in The Winter School Disordered Systems and Biological Organization at Les Houches, Biennenstock et. al. eds., NATO Series in Computer Sciences, Vol. 20, Springer Verlag, pp. 101-112, 1986.
22. Knowledge representation by automata networks, in Computers and Computing, P. Chenin et. al. eds., Wiley-Masson, 175-180, 1986 (with F. Fogelman).
23. Invariants in automata networks, in J. Phys. A. Math. Gen., 19 L961-L965, 1986 (with G. Vichniac).
24. Lyapunov functions for parallel neural networks, R.R. M.I.T. Lab. for Computer Sciences, in 'Neural Networks for Computing', J.S. Denker ed. Am. Inst. Phys., 165-181, 1986 (with G. Vichniac).
25. Antisymmetrical neural networks, in Discrete Applied Maths., 13, 97-100, 1986.
26. Performance of an asynchronous pipeline array of automata, in Math. Soc. Sci., 14, 39-49, 1987 (with Shako, M. Tchuente).
27. The 3x + 1 problem: A quasi cellular automaton, in Complex Systems, 1, 349-30, 1987 (with G. Vichniac).
28. Properties on positive functions and the dynamics of associated automata networks, in Discrete Applied Maths., 18, 39-46, 1987 (with S. Martínez).
29. Lyapunov functions associated to automata networks, Chapter of the book Automata Networks and Applications, Manchester Univ. Press, Non Linear Systems Series, pp. 58-81 (F. Fogelman et. al.eds.),1987.
30. Threshold networks and generalisations, invited paper, in Procc. de la 17ème Ecole Francaise de Informatique - Theorique, Lectures Notes in Computer Sciences, No.316, C. Choffrut ed., Springer-Verlag, 1987.
31. Analysis of Marr-Poggio's stereo algorithm, in Procc. Cognitiva 87, CESTA eds. Paris, 401-404, 1987 (with E. Sepúlveda).
32. Difurcation structure of a discrete neuronal equation, in Disc. Applied Maths, 21, 21-34, 1988 (with M. Cosnard, D. Moumida).
33. Dynamical behaviour of a neural automaton with memory, in Complex Systems, 2, 161-176, 1988 (with M. Cosnard, D. Moumida, T. de Saint Pierre).
34. Decreasing energy functions and lenghts of transients for some cellular automata, in Complex Systems, 2,5 501-508. 1988 (with A.M. Odlyzko).
35. Redes de autómatas, dinámica y aplicaciones, in Rev. Mat. Apl., 77-89, 1988.
36. The one-distribution of Gibbs states on Bhete lattice are probability vectors of period ≤ 2 for a nonlinear transformation in J. of Statistical Physics, Vol. 52, No. 1/2, 267-285, 1988 (with S. Martínez).
37. Dynamical neural schema for quadratic optimization problems, in Procc. of the INNS Meeting, Boston, 1998, in Networks, Vol. 1, 96, 1988 (with G. Hernández, M. Matamala).
38. Periodic behaviour of one and two dimensional neural networks, in Procc. of the INNS Meeting, Boston, 1988, in Neural networks, Vol. 1,97, 1988.
39. Cellular automata, dynamical and complexity, in Procc. Workshop Cellular Automata Modeling of Complex Physical Systems, Les Houches, Manneville et. al. eds., Procc. in Physics 46, Springer-Verlag, 1989.
40. Potts model automata networks, in Instabilities and Nonequilibrium Structures II, pp. 89-96, Tirapegui E. and Villarroel eds, D. Reidel Publ- 1989.
41. Complexity and Dynamics of neural networks, in Disordered Systems and Biological Models, World Scientific L. Peliti ed., 1-21. 1989.
42. Cellular automata, dymamics and complexity, in Cellular Automata Applications in Physical Chemistry R. Dagonnier et. al. eds., Mons Univ, Belgium, June 1989.
43. Energy functions in neural networks with continuos local functions, in Complex System, Vol. 3, 269-293, 1989 (with F. Fogelman, S. Martínez, C. Mejia).
44. Energy and atracctors in parallel Potts dynamics, in J. Phys. A: Math Gen. 1989 (with G. Vichniac).
45. Local graph transformation driven by Lyapunov functionals, in Complex Systems, Vol. 3, Number 2,173- 184, 1989.
46. Exponential transient classes of symmetric neural networks for synchronous and sequential updating, in Complex Systems, Vol 3, 6, 589-597, 1989 (with S. Martínez).
47. Neural networks dynamics, in Neurocomputing, F. Fogelman et. al. eds., NATO-ASI Series, Vol. 68, pp. 93-102, Springer Verlag, 1990.
48. Lyapunov functionals for automata networks defined by ciclically monotone functions, in SIAM J. on Discrete Math., Vol. 4, Nº 2, pp. 200-206, 1991 (with S. Martínez).

49. Sand piles, combinatorial games and cellular automata, in Instabilities and Non Equilibrium Structures III. E. Tirapegui, ed., Kluwer Pub., Holland, pp. 101-121, 1991.
50. Sequential aud parallel dynamics complexity in automata networks, in Rev. Mat. Aplic., 12, 103-106, 1991.
51. One dimensional sand piles, cellular automata and related models, in Procc. of Int. Conf. in Non-Linear Phennomena, Elsevier, P. Cordero et. al. eds., pp. 169-185, 1991 (with M.K.Kiwi).
52. Palallel chip firing games on graphis, in Theor. Comp. Sci., 92, 291-300, 1992 (with J. Bitar).
53. Sand pile automata, in Ann. Inst. Henri Poincaré, Vol. 56, Nº 1, pp. 75-90, 1992.
Verlag, 219-230, 1992 (with M. K. Kiwi).
54. Automata networks strategies for optimization problems, in Automata Networks, Dynamical Systems and Statistical Physics, pp. 65-87, Kluwer Pub., 1993 (with S. Martínez).
55. On the limit set of some universal cellular automata, in Theoretical Computer Sciences, 110, pp. 53-78, 1993 (with S. Martínez, A. Maass).
56. Local extremal rules and Potts automata, in instabilities and non equilibrium structures IV, E. Tirapegui et. al. (eds), Kluwer Pub., 1993 (with G. Hernández).
57. Extremal automata for image sharpening, pre-print HLRZ, Julich 1993, in Journal of Modern Physics C (with G. Hernández and H. Herrmann), 1993.
58. Lyapunov funtionals associated to automata, in CA and Cooperative Systems, NATO-ASI Series, Springer-Verlag Vol. 396 pp. 203-210, Boccara et. al. eds., 1993.
59. Sand-Pile dynamics in a one dimensional bounded lattice, in CA and Cooperative Systems, NATO-ASI Series, Springer Verlag, Vol. 396. pp. 211-225, Boccara et. al. eds., 1993.
60. Computing complexity of symmetric quadratic neural networks, in Procc-ICANN'93, Int. Conf. Artif. Neural Networks, pp. 677, Springer Verlag (1993) (with M. Matamala).
61. Discrete-parallel sequential update of neural networks with adapting synapses, in Procc. IJCNN'93, International Joint Conf. Neural Networks, Vol. 3, pp. 2371-74 (1993).
62. Complexity of block-sequential update for symmetric neural networks, in Procc. IJCNN'93, Vol. 2, pp. 1469-72 (1993) (with M. Matamala).
63. Lyapunov operators to study the convergence of extremal automata, in Theor.Comp. Sci., 125, pp. 329-337 (1994).
64. Dynamical and complexity results for high order neural networks, Int.Journal of Neural Systems, Vol. 5(3), pp 241-252 (1994) (with M. Matamala).
65. No Polynomial bound for the period of the parallel chip firing game on graphs, Theor, Comp. Sci., 136, pp. 527-532 (1994) (with M.A. Kiwi, R. Ndoundam, M. Tchuente).
66. Energy functionals for neural networks, invited survey to the Handbook of Brain Theory and Neural Networks edited by M.A. Arbib, Bradford books, M.I.T.-Press, 1995.
67. Cyclic automata networks on finite graphs, Lecture Notes in Computer Science, 911, Springer-Verlag, R.Baeza-Yates et al eds., pp. 398-410 (1995) (with M. Matamala).
68 A characterization of the existence of energies for neural networks, in 22nd International Colloquium on Automata Languages and Programming, Lecture Notes in Computer Sciences, Springer-Verlag (1995) (with M. Cosnard).
69. On line coarse ore granulometric analyzer using neural networks, in Proc. of IJCNN, Paris, October 1995 (with R. Fernández, E. Viennet, R. Barrientos, M. Telias).
70. Reaction-diffusion automata: three states implies universality, in Theory of Computing Systems, 30, 223-229 (1997) (with M. Matamala).
71. Dynamics behavior of cyclic automata networks, in Disc. Appl. Maths. 77, 2, 161-184 (1997) (with M. Matamala).
72. Discrete State Neural Networks and Energies, in Neural Networks, Vol. 10, N°2, pp 327-34 (1997) (with M. Cosnard).
73. Symmetric discrete universal neural networks, Theor. Comp. Sci., 168, 405-416 (1996) (with M. Matamala).
74. Universality of the chip firing game on graphs, Res. Rep., LITP-U. Paris-VII, 1995, Theor. Comp. Sci., 172, pp 121-134, 1997 (with M. Margenstern).
75. Sand-pile as a universal computer, J. of Modern Phys. - C, 7(2) 113-122 (1996) (with M. Margenstern).
76. Source reversal and chip firing, in Theor. Comp. Sc., 233, pp. 287-295 (2000) (with E. Prisner).
77. Complexity of tile rotation problems, in Theor. Comp. Sc., 188, pp. 129-159 (1997) (with I. Rapaport).

78. Uniform Simulations of Turing Machines by Cellular Automata, in Cellular Automata and Complex Systems, pp.23-36, Kluwer (1999) (with M. Matamala).
79. Tiling allowing rotations only, Theor. Comp. Sci. 218 (1999), 285-95 (with I. Rapaport).
80. Dynamical behavior of Kauffman networks with and-or gates, in Biol. Systems, Vol. 8 N° 2, pp. 151-175 (with G. Hernández), (2000).
81. The canonical folding, in Procc of Int. Conf. on Mathematics and Design '98, pp. 523-534. San Sebastian, Spain, 1998 (best paper award).
82. Simple lattice model with inertia for sand piles, in Granular Matter, 1, pp. 137-140 Springer Verlag (1998) (with G. González, H. Herrmann and S. Martínez).
83. Dynamical Properties of Min-Max networks, Vol. N° 6 467-473 Int. Journal of Neural Systems (with M. Matamala, P.Estévez). (2000)
84. A biological generator of prime numbers, in Nonlinear Phenomena in Complex Systems Vol., 3, Nº2, pp 208-213, (2000) (with M. Markus, M. Schick).
85. Sand Piles and order structure of integer partitions, to appear in Discrete Applied Maths., (2001) (with M. Morvan. Ha Duong Phan).
86. Lattice structure and convergence of a game of cards, to appear in Annals of Combinatorics (2001) (with Ha Duong Phan, M. Morvan).
87. Classification of defects on wood boards based on neural networks and genetic selection of features, IIIS World Multiconference on Systemics Cyibernetics and Informatics, (SCI'98), Orlando USA, July 1998,, Vol. I, pp.624-629 (with P. Estévez, C. Pérez Caballero. G. Buliler).
88. The structure of Linear chip firing games and related models, to appear in Theor. Comp. Science, (2000) (with M. Morvan, H.D.Phan)
89. Shell structures with magic numbers of spheres in a swirled dish, Phys. Review E., Vol. 60, N° 6, 7182-85 (with K. Kotter, M. Markus) (1999).
90. Tiling with bars under tomographic contraints, Theorical Computer Sciences 290 (2003) 1317-29 (with I. Rapaport, Ch. Durr, E. Remila).
91. Complexity of Perceptron Recognition for a Class of Geometric Patterns, Theorical Computer Sciences, 299, pp 65-79, (2003) (with J. Aracena).
92. Intermingled basins due to finite accuracy, Phy. Rev. E. Vol. 62, N° 1, pp 397-401, (2000) (with M. Schmick, M. Markus).
93. Complexity of Langton's Ant, Discrete Applied Mathematics. Vol. 117, Issue 1-3, pp. 41-50, (with A. Gajardo, A. Moreira). (2002)
94. Generalized Langton's Ant: Dynamical Behavior and Complexity, STACS'2001 Lectures Notes in Comp. Sci. 2010, pp.259-70. (with A. Gajardo, A. Moreira). (2001)
95. Dynamical Behavior and Complexity of Langton's Ant, in Complexity, Vol.6 ,N°4, pp 46-51 (2001), (with A. Moreira and A. Gajardo).
96. A note about Braess Paradox via local Distributed Algorithm bases on autonomous agents, send to Transportation Science, (2000), (with A. Jofré, J. Becerra).
97. Swirling granular solidlike clusters, Phys. Rev. E 61, 4069 (2000) (with M. Scherer, K. Koetter, M. Markus, and I. Rehberg).
98. Self-organization of interacting, round particles into symmetric or asymmetric aggregates", in: 'Symmetry 2000' (I. Hargittai & T. Laurent, eds.), Portland Press, London, pp 377-384, (2002) (with M. Markus, K. Koetter, M. Schmick and M. Grewe).
99. Prime number selection of cycles in a predator-prey model, Complexity, Vol. 6, Nº4, 33-38, (2001) . (with M. Markus).
100. Cicadas showing up every prime number of years, The Math. Intelligencer, Vol.24, N°1, pp.30-32 (with M. Markus). (2002).
101. Prey population cycles are stable in an evolutionary model if and only if their periods are prime, Science Asia 28 (2002): 199 - 203 (with M. Markus, O. Schulz).
102. Universal Cellular Automaton Over a Hexagonal Tiling with 3 States. International Journal of Algebra and Computation, Vol. 11 (3), pp 335-354. (2001). (A.Gajardo)

103. About the Dynamics of Some Systems Based on Integer Partitions and Compositions (Eric Goles, Michel Morvan and Ha Duong Phan). LNCS issue, proceedings of FPSAC2000. 214-225. 12 pages.
104. Sand piles models and discrete ordred structures. (Eric Goles, Michel Morvan and Ha Duong Phan). In International Conference of Combinatorics and Physics, Los Alamos, New Mexico, August, USA, 1998. 11 pages.
105. Positive and Negative Circuits in Discrete Neural Networks, in IEEE Transactions on Neural Networks 15 (1), pp 77-83, (2004) (with J.Aracena, J.Demongeot).
106. On limit Cycles of Monotone Functions with Symmetric Connection Graph, in Theorical Computer Sience , vol. 323, number 2, pp. 231-244 (with J.Aracena, J.Demongeot). (2004).
107. Fixed Points and Maximal indepent sets on AND-OR Networks, in Discrete. Appl. Math. 138 (3), pp 277-288,(with J.Aracena, J.Demongeot). (2004)
108. Genetic Input Selection to a Neural Classifier for Defect Classification of Radiata Pine Boards, Forest Products Journal, Vol. 53, No. 7/8, July/August 2003, pp. 87-94.
109. On - off intermittency and intermingled-like basins in a granular medium, in Phys. Rev. E., 66, 0606214/1-4 (2002) (with M. Markus, M. Schmick).
110. Frieze-generation using artificial life, in 'Isama-Bridges'. (Ed. by J. Barrallo, N. Friedman, R. Sarhangi, C. Séquin, J. Martínez and J.A. Maldonado), 151-160, University of Granada (2003). (with M .Markus, D. Fischer). (2003).
111. Folding and Tiling, in Teor.Comp. Sci. Vol. 322, number 2, pp. 285 – 296 (2004).
112. Control of Turbulence: determination of the minimun pinning distance from the spatial measure entropy, to appear in Physical Review E. (with A. Greilich and M. Markus). (2004).
113. Dynamics of a class of ants in a one dimensional lattice in Theorical Computer Science, vol. 322, number 2, pp. 267-283. (with A. Gajardo). (2004).
114. On conservative and monotone one-dimensional cellular automata and their particle representation, Theorical Computer Science Vol. 325, N°2, pp 285-316) . (with A. Moreira, N.Boccara). 2004.
115.- Program size complexity of self-assembled rectangles: constant and variable temperature, submitted to DNA-computing, (with I. Rapaport, C. Rojas). (2004).
116.- San Piles Models and lattices: a comprensive survey, Theor. Comp. Science, vol. 322, number 2, pp. 383-407 (with M. Latapy, C. Magnier, M.Morvan, H,D. Phan). (2004).
117.- Emergence of Prime Numbers as the Result of Evolutionary. Physical Review Letters, (Note) PRL 95, 22980. (with M.Markus). (2005).
118.- Tracks Emerging by Forcing Langton´s Ant with binary sequences, to appear in Complexity. (with M.Schmick, M. Markus). (2006).
119.- Crosing Information in Two Dimensional Sanpiles, submitted to Theor. Comp. Science. (with A.Gajardo). (2006)

7.-BOOKS:

1.- Neural and Automata Networks: Dynamical Behaviour and its Applications, Serie: Mathematics and Its Applications, Kluwer Pub. Co., 250 pp, Marzo 1990 (first edition), 1991 (second edition) (prize M. Montt) (with S. Martínez).
2.- Algebra, Ed. Pedagógicas (Chile), 450 pp. (1993). Also edited as textbook at the School of Engineering, U. of Chile, 1990. It is the official text at our school (from 1990) and it is also used in several national universities.

8.- EDITED BOOKS:

1.- Codificación de Sistemas Dinámicos y Redes de Automátas, Proceedings Congreso Franco-Chileno de Matemáticas Aplicadas, Rev. Mat. Apl., Vol. 9, 2, 1988. (with S. Martínez).
2.- Proccedings Second Workshop on Disordered Systems and Biological Models, Rev. Mat. Apl., 1991 (With S. Martínez).
3.- Dynamical Systems and Cellular Automata, 400 pp., Academic Press, 1985 (with J. Demongeot, M. Tchuente).

4.- Automata Networks, Dynamics Systems and Statistical Physics, 250 pp., Kluwer Pub., 1992 (with S.Martínez).
5.- Cellular Automata and Cooperative Systems, 546 pp., NATO-ASI Series, Vol. 396, Kluwer Pub., 1993 (with N. Boccara, S. Martínez, P. Picco).
6.- Cellular Automata, Dynamical Systems and Neural Networks, Procc. III-Summer School FIESTA 92, Vol. 282. Maths. and Its Applications, Kluwer Pub. (with S. Martínez).
7.- Theoretical Informatics, Proc. of LATIN'95, Lecture Notes in Computer Science, 911, 523 p. (1995) (with R. Baeza-Yates, P.V. Poblete).
8.- Dynamics of Complex Interacting Systems, Kluwer, 1996, 177 p. (co-ed. S. Martínez).
9.- Cellular Automata and Complex Systems, Kluwer, 1997 (co-ed. S. Martínez).
10.- Complex Systems, Kluwer, 300 p. 2001 (co-ed. S. Martínez).

10.- TUTOR ADVISER:

1.- Diseño de redes potable, un problema de optimización concava.
A. Cifuentes, memoria Ing. Matemático, Dept. Mat. Esc. Ing. U. de Chile, 1977. (at present Ph.D. Caltech, researcher at Yorktown Heights, I.B.M.).
2.- Analyse et simulation des réseaux d'automates.
M.Legendre Ph. D. I.M.A.G., Grenoble, Francia, Nov. 1982. Ph.D supervision en automata networks.
3.- Comportement d'une fontion monotone á une dimension.
Y. Sakho, Master Tliesis, I.M.A.G., Grenoble, Francia, 1983. (at present Ph.D., professor in France).
4.- Redes de autómatas.T. de Saint Pierre, thesis Mathematical Engineering, Dept. Mat. Esc. Ing. U. de Chile, Julio 1985. also Ph.D. in Neural Networks, Paris VI - France).
5.- Funciones de Lyapunov en redes neuronales para la estereovisión.
E. Sepúlveda, thesis Electrical Engineering, Esc. Ing. U. de Chile, 1989. (supervision of Ph.D. thesis on Automata Networks and Robotics) 1993, Paris VI - France).
6.- Juegos combinatoriales en redes de autómatas.
J. Bitar, memoria Ing. Matemático, Dept. Mat. Esc. Ing. U. de Chile, 1989. (at present working on Cominication Nets. Califorma).
7.- Conjuntos límites en máquinas de Turing.
Alejandro Maass, thesis Engineering, 1989. (at present researcher at Depto. Ing. Mate-Mática, Univ. de Chile) (with S. Martínez).
8.- Complejidad de redes neuronales con argumentos no-lineales.
Martín Matamala, thesis Mathematical Engineering, 1991. (at present at Depto. Ing. Matemática Univ. de Chile).
9.- Optimización mediante redes neuronales.
Gonzalo Hernández, thesis Mathematical Engineering, 1991.
10.- Autómatas de pilas de arena y aplicaciones.
Marcos Kiwi, thesis mathematical Engineering, 1991. (at present Ph.D. at, M.I.T. and researcher at Depto. Ing. Matemática, Univ. de Chile, prize M. Orrego Puelma, to the best student F.C.F.M., U. de Chile).
11.- Estudios de complejidad en redes de autómatas.
Martín Matamala, Ph.D. Thesis on Mathematical Models, 1994 (prize D. Papp to the best Ph.D. thesis of the University of Chile of the year 1994).
12.- Complejidad de embaldosados planos, Iván Rapaport, Thesis Mathematical Engineering, May (1995).
13.- Redes Neuronales aplicadas a problemas de granulometría, Rodrigo Fernández, Thesis Mathematical Enginnering 1995.
14.- Aplicaciones de recocimiento de patrones del simulador de redes neuronales Rochester, Oscar Agacino, Thesis of Computation Engineering, May 1995.
15.- Ph.D. in Math. Modeling, F.C.F.M., U. de Chile, Gonzalo Hernández (1997), (with three edited papers).
16.- Thèse de docteur-France, Jèrome Durand (Lab. d' Informatique du Parallelisme, Ecole Normale Supériere de Lyon and Lab. LABRI-Bordeaux, (1997), France.
17.- Clasificador Neuronal de Características de Madera, Julio Aracena, Math. Ing. Thesis, (1997).
18.- Simulación de autómatas celulares para flujo gravitacional en minería, Sebastián Peña, Comp. Sci. Ing. Thesis, (1997).

19.- Universalidad en autómatas celulares bidimensionales Anahí Gajardo, Math. Ing. Thesis, (1998).
20.- Simulación local de fenómenos granulares, Gregorio González, Math. Ing. Thesis, (1998).
21.- Lattices Structure of some discrete dynamical systems. Phan Ha Duong, Ph.D. Thesis, U. Paris VII co-advised M. Morvan) (1999).
22.- Dynamics of Bi-Dimensional Artificial Ants, Anahí Gajardo, Ph.D. in Math. Modelling, Univ. Chile (2001).
23.- Dynamics of Discrete Networks Associated to Biological Models, Julio Aracena, Ph.D. in Progress (1999).
24.- Local on line Algorithms on Networks and Applications, Andrés Moreira, Ph.D. in Progress (1999).
25.- On the line Algorithims on Telephonic Networks, Jorge Becerra, Math. Ing. Thesis (1999).
26.- Simulación de Sistemas Granulares Mediante Autómatas Celulares, Pablo Román Asenjo, Comp. Sci. Ing. Thesis (co-advised P. Dartnell) (1999).
27.- Hopfield memories and genetic algorithms, Julio Villalobos, Computer Science, Ing. Thesis. (2002).
28.- Discrete Dynamical Systems and Applications, Lilian Salinas, Ph.D in Math. Modelling (U. De Chile) and Ph.D. in Computer Science, Ecole Normale Superiere de Lyon - France (2003 -).
29.- Self-assembled rectangles with DNA tiles, Cristóbal Rojas, Math. Ing.Thesis. (2003 - 2004).
30.- Discrete Mathematical Models Applied to genetic regulation and metabolic networks, Patricio Ramírez, Ing. in Biotechnology. (2003).
31.- Relations between parallel and sequential iteration in discrete networks, Adrien Elena, Ph. Thesis, Univ. Grenoble, France (2006 -)

11.- PRINCIPAL GRANTS:

1.- Chilean-French cooperation: Support for invited professors and research staying, since 1977 - up today.
2.- CNRS Associated researcher, 1982-1985.
3.- PNUD Support for invited professors and research staying, 1984-86.
4.- FONDECYT: Research projects, since 1984 - 1999.
5.- FUNDACION ANDES: Scholarship Sabbatical year 1989, meetings and research stayings.
6.- TWAS: Support for research project, 1986.
7.- TRIESTE: Research project, 1989.
8.- DIGITAL USA: (software on neural networks circuits CAD), 1990, 1993.
9.- UNU (Univ. Nac. Unidas): Researh staying Cameron, Africa, 1991.
10.- UNESCO-CIMPA: Support for summer school on parallel calcul, January 1994.
11.- E.C. (Comunidad Europea): Research Project in Applied Mathematics, 1993 - up today.
12.- E.C. (Comunidad Europea): Research Project on Parallel Computation, (to instal a parallel computer and develop its applications in Chile) 1993-95.
13.- FONDEF: Neural Networks Engineering project, (aplications, arrangement and develop in neural networks). The first and unique project adjudicated on Informatic field, 1993-96. This project has several researchers distributed in four national universities.
14.- FONDEF: Distributed algorithms (several researchers in 4 national universities 97-up today.
15.- E.C. PARALIN project to develop parallel software for industrial problems (several countries: France, Spain, Uruguay, Chile), 1996-2000.
16.- French ECOS, 1996-2000.
17.- European Union Grant for the Second School on Complex Systems (Valparaíso, Chile, January 2004).
18.- European Union Grant for the Thematic Institute on Complex Systems (January 2005)

12.- PRINCIPAL RESEARCH POSITIONS AND/OR INVITED PROFESSOR:

1.- Laboratoire des Circuits Logiques, Univ. Libre de Bruxelles (October 1980).
2.- Biophysics Laboratory, Univ. of Jerusalen, (three stayings 1980, 82, 83).
3.- Inst. Blaise Pascal LITP, Univ. Paris VII (1981, 83, 93).
4.- Laboratoire de Dynamique des Reseaux, Ecole Polytechnique and CESTA-Paris

(several stayings 1981, 82, 84, 85).
5.- I.M.A.G., Univ. de Grenoble, (several stayings 1982 - 83, 85).
6.- Laboratoire de Mathematique, Université de Bordeaux (1983, 84).
7.- M.I.T. Laboratory for Computer Science, USA (1986).
8.- Ecole d' Ingènieurs Cergy, France (1986).
9.- Laboratoire de Mathématiques, Univ. de Montreal, Canada (1986).
10.- Math. Dept. Univ. of Sao Paulo (three times from 1987).
11.- Bell Laboratories, Math. Dept., Murray Hill, U.S.A. (1987, 88).
12.- Cibernetic Lab., Univ. of Cataluña, Barcelona, Spain (1989, 93-94).
13.- Institut for Computer Science, Univ. of Paris V (1989).
14.- Laboratoire Informatique du Parallelisme, Ecole Normale Supérieure de Lyon several times from 1989-up today.
15.- IMPA, Río de Janeiro, Brasil (1990).
16.- International Institute for Scientific Interchange (ISI), Turin, Italy (1990).
17.- Mathematical Dept., Univ. of Memphis, U.S.A. (1991).
18.- Math. Department, Univ. of Yaunde, Cameron (1991).
19.- Math. Department, Université d'Orsay, France, June 1995.
20.- Institute for Complex Systems, Santa Fe USA, 1999.
21.- Bios Santa Fe, 1999 – 2000.
22.- U. Grenoble, Ecole Normale Sup. de Lyon (as DRCE, CNRS). (2003 -).
23.- ATENEO, Pol. Institute, Torino – Italy. (2004 -).
24.- École des Hautes Études en Sciences Sociales (EHESS), Paris- France (January 2006)

13.- ORGANIZATION OF MEETINGS AND CONGRESS:

1.- Primeras Jornadas Chilenas de Matemática Aplicada, 1976. Proceeding edited by Ed. Universitaria.
2.- Colloque International sur le comportement dynamique des réseaux. Luminy, France, Sept. 1983. Important meeting supporting by CNRS y Soc. Mat. de Francia entre otros. Proceeding edited by Press.
3.- Segundo Simposio Chileno de Matemática. Talca, Diciembre 1986. Supporting by Soc. Mat. de Chile, PNUD, UNESCO (with Dr. Figueroa).
4.- Congreso Franco Chileno Matemáticas Aplicadas. Field: Dynamical Systems and Neural Networks, (with S. Martínez), proceeding edited by Rev. de Matemáticas Aplicadas.
5.- IX-ELAM Escuela Latinoanericana de Algebra, 1988 (with R. Baeza, R. Soto, I. Mikemberg).
6.- Primera Escuela de Física Estadística y Sistemas Cooperativos. Santiago, 1988 (with S. Martínez), procceding edited in Kluwer Pub.
7.- Second Workshop on Disordered Systems and Biol. Organization. Centro Interamericano de Física, Colombia. 1989, proceeding edited with S. Martínez, in Rev. de Matemáticas Aplicadas.
8.- Segunda Escuela de Física Estadística y Sistemas Cooperativos. Santiago, 1990 (with S. Martínez), procceding edited in Kluwer Pub.
9.- Tercera Escuela de Física Estadística y Sistemas Cooperativos. Santiago, 1992 (with S. Martínez), procceding edited in Kluwer Pub.
10.- First Latin American Symposium on Theor. Informatics. Sao-Paulo, 1992. (Goles et al), Proceeding edited in Lect. Notes in Comp. Sci., 583, I. Simon (ed.), Springer-Verlag.
11.- Winter School at Les Houches: Cellular Automata and Cooperative Systems. July 1992 (with N. Boccara, S. Martínez, P. Picco). Procc. en NATO-ASI series, 396.
12.- Summer CIMPA-UNESCO on Parallel Computing. Temuco, Chile, January 1994, (with C. Burgueño, J.C. Bermond).

13.- Fourth School on Stat. Phys. and Cooperative Systems, Santiago, 1994 (with S. Martínez) proceeding to appear in Kluwer.
14.- LATIN'95. Second Latin American Symposium on Theoretical Informatics, (chairs: R. Baeza-Yates, E. Goles), proceeding edited in LNCS, Springer-Verlag, 1995.
15.- AUTOMATA'98, Workshop IFIP on Cellular Automata, Santiago, December 1998.
16.- FIESTA'98, 6th School on Complex Systems, Santiago, December 1998 (with S. Martínez)
17.- IFIP Congress in Cellular Automata, Santiago, December 1998.
18.- FONDAP Summer School on Applied Mathematics, Antofagasta, Chile, January 1999.
19.- Workshop on Discrete Mathematics, Center for Math. Modelling. Santiago –Chile, June 2001.
20.- I Summer School on Complex Systems, Valparaíso - Chile, January 2003.
21.- II Summer School on Complex Systems, Valparaíso - Chile, January 2004.
22.- Thematic Institute on Complex Systems, Valparaíso - Chile, January 03-21, 2005.
23.- IV Complex Systems Summer School, Valparaíso – Chile, January 16-20, 2006.

14.- PRINCIPAL INTERNATIONAL INVITED LECTURES :

1.- Darmstadt Pol. Institute, Germany, 1980.
2.- Colloque Cerisy, "Regards sur la théorie des graphes", France, 1980.
3.- Joint Workshop CNRS Service de Chimie-Physique, Univ. Libre de Bruxelles, Belgium, 1980.
4.- Workshop on Automata Networks, Univ. of Compiegne, France, 1980.
5.- Journées Françaises en Algorithmique, Univ. de Limoges, 1982.
6.- Troisiemes Journées Hispano-Françaises d'Informatique Théorique, Montpellier, France, 1982.
7.- Group Physic of Computing, M.I.T. Lab. for Computer Science, USA, 1983.
8.- Winter School on Disordered System, Les Houches, France, 1985.
9.- Course in dynamics and Computation, C.N.R.S.-Paris, 1985.
10.- Quatorzieme Ecole de Primtemps sur les Reseaux d'Automates, Argeles, France, 1986.
11.- Congress Cellular Automata '86, M.I.T., USA, 1986.
12.- First School on Disordered Systems and Biol. Organization, Centro Interamericano de Física, Bogotá, Colombia, 1987.
13.- Workshop on Aspectos Teóricos de Computaçao, April-1988, Sao-Paulo (only 8 invited lectures).
14.- Dept. of Mathematical Sciences, Univ. of Memphis, USA, 1989.
15.- Winter School on Cellular Automata and Complex Systems, Les Houches, France, 1989.
16.- European Workshop on Neurocomputing, NATO, Les Arcs, France, 1989.
17.- Workshop on Cellular Automata, Univ. of Mons, Belgium, 1989.
18.- Lab. For Comp. Science, Complutense University, Madrid, 1989.
19.- Institute d'Hautes Etudes en Informatique, Univ. Paris-V, 1989.
20.- Centre de Physique Theorique, Saclay, 1989.
21.- BBN-Networks, 1989-91.
22.- Brasilian School on Computer Science, (one of the five international invited courses), Sao-Paulo, 1990.
23.- Lab. De Physisque Statistique, Ecole Normale Supèrieure, Paris, France, 1992.
24.- IBP-LIPT, U. de Paris VII 1993.
25.- Pol. Inst. Of Laussanne, Swisserland, 1993.
26.- LGI-I.M.A.G. Grenoble, 1993.
27.- Laboratoire de Math. Discretes, Marseille, 1993.
28.- Osaka University, 1993.
29.- Hirosima University, 1993.
30.- NTT-Japan, 1993.
31.- Sukuba University-Japan, 1993.
32.- LITP. U. Paris VII 1994.
33.- Dagshtuld, Germany 1995.

34.- Laboratorio Cibernética, U. Politécnica de Cataluña, Spain, 1995- 1998.
35.- LIP-ENSL, Ecole Normale de Lyon, several times 96-99.
36.- International Workshop on Universal Machines, Paris 1995.
37.- Bios, USA (1999-2000).
38.- Institute for Complex Systems, USA (1999).
39.- BIOS – Sta. Fe, USA (2000).
40.- Workshop on Discrete Mathematics, Institute H. Poincaré, Paris (2001).
41.- University of Zagreb - Croatia, (2002).
42.- University of Split - Croatia, (2002).
43.- Croatian Academy of Science (2003).
44.- Ecole Normale Sup. de Lyon (June 2003).
45.- University of Auckland, New Zealand (March 2004)
46.- Chateau de Cerisy (France, June 2004).
47.- De la autopoiese a la neurophénoménologie (Sorbone University, Paris, June 2004)
48.- ATENEO at Politechnical Institute of Torino, Italy. (September 2004).
49.- Physics Department , Pol. Inst., Torino, Italy (September 2004).
50.- Workshop about Reduction and Complex Systems, CREA, Polytechnique, Paris, France (December 2005).

15.- ADMINISTRATIVE CHARGES:

1.- Director, Group Numerical Analysis, Dept. Ing. Matemática, 1976-77.
2.- Membership, Mathematical Technical Board, FONDECYT (several oportunities, from 1988 up today).
3.- President, Evaluation Board, Dept. Ing. Matemática, 1989 - up today.
4.- Ph.D. Coordinator, Magister on Applied Mathematics and Ph.D. Mathematical Models, 1988-1990.
5.- Counsellor, Research Direction, U. Católica del Norte, 1990.
6.- Membership, Academic of Sciences, Chile, from 1990 up today.
7.- Director Research Direction, Facultad de Ciencias Físicas y Matemáticas, U. de Chile, 1990 - up today.
8.- Membership, Advisory Board, CONICYT's Presidency, six scientifics, from 1992 - 94.
9.- Membership, National Board, Centro Integrado de Información Científico Tecnológica, F.C.F.M., U. de Chile, from 1992 up today.
10.- Membership, National Council, CONICYT, Chile, 1995.
11.- Director of National program FONDAP an Applied Mathematics 1996-March 2000.
12.- Director of the National Center for Modelisation and Information Sciences, 1998 – March 2000.
13.- Member of the Council of Ministerio de Educación for under and post-graduate developements in Chilean universities, 1998- up day.
14.- Member of the Directory of the University Press (Editorial Universitaria), 1996 -1999.
15.- Member of the Scientific Committee of National Explora Program to introduce science and technology in Chilean students and citizens, 1996 - 1999.
16.- Member of the Directory: Fundación Chile, INTEC, FDI-CORFO, CIMM and Chilean Commission of Nuclear Energy.
17.- President of CONICYT (National Commission for Scientific and Tecnological Research). (2000-)

16.- ACTIVITIES OF SCIENTIFIC PROMOTION AND DISSEMINATION

1. Open TV

Conduction of a one hour prime-time program (about 40 programs) on the state chilean television (TVN) about scientific and technological topics (1996 - up today).

This program has been very successful with 15 rating points (one point is about 70.000 people) and an excellent critique in Chilean journals and Newspapers. Also, it has been awarded among the best tree cultural programs in Chile (APES-97), and at international level in Prix IAMS to the best scientific documentary, Tele-Science, Montreal - Canada. Also it is a comment program in TV Culture, Brazilian open TV. Recently the program won the prestigious UNESCO-CNRS Prize Jules Verne. (Paris, 2004).