

CV Martín Guillermo Zimmermann

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Birthdate: 13 December, 1968.

Education

POSTGRADUATE

Doctor in Philosophy, Uppsala University, Sweden

6 May 1997

Thesis title: “*Global Bifurcations and Chaotic Dynamics in Physical Systems*”

Comprehensive Summaries of Uppsala Dissertations from the Faculty of Science and Technology **279**, Acta Univeristatis Upsaliensis.

Director: Prof. Asoc. Mario Natiello¹.

GRADUATE

Licenciado en Ciencias Físicas, Universidad de Buenos Aires, Argentina.

17 August 1993

Average marks: 8.59 (10 is the best grade and 4 is the minimum passing grade).

Positions

COFOUNDER of Zews, a software firm in Buenos Aires, which specializes in leading edge optimization libraries applied to logistics (<http://www.zews.com.ar>) March 2006– present

AGENCY MEMBER, of National Science Council (CONICET).

Approved as a full-time researcher of the CONICET, to work at the Physics Department, School of Exact and Natural Sciences–Univ. of Buenos Aires February 2002– March 2006

TEACHING ASSISTANT, Physics Department

School of Exact and Natural Sciences–Univ. of Buenos Aires

August 2000– 2005

INTERNATIONAL FELLOW of the Santa Fe Institute (USA)

2002-2004

Grants and Scholarships awarded

- 2005–2007. RESEARCH GRANT co-Principal Investigator. PICT2004 from the Agencia de Promoción Científica y Tecnológica (Argentina), Dept. of Physics, School of Exact and Natural Sciences–Univ. de Buenos Aires, Argentina. Research grant of \$66000/2 years.
- 2002–2004. RESEARCH GRANT “Subsidio IM40” from the Secretary of Science and Technology (SETCIP, Argentina), Dept. of Physics, School of Exact and Natural Sciences–Univ. de Buenos Aires, Argentina. Research grant of \$30000/year.
- 1999–2001. POSTDOCTORAL fellowship FOMEC-UBA, Dept. of Physics, School of Exact and Natural Sciences–Univ. de Buenos Aires, Argentina. Director: Dr. Juan Pablo Paz.
- 1998–1999. POSTDOCTORAL fellowship from Ministry of Education of Spain, Instituto Mediterráneo de Estudios Avanzados (IMEDEA), UIB — Consejo Superior de Investigaciones Científicas, Mallorca, Spain. Director: Prof. Maxi San Miguel.

¹Currently at the Dept. of Mathematics, Lund University, Sweden.

- 1997. VISITING RESEARCHER (Sept. – Oct.) at the Max-Planck Institute für komplexer Systeme, Dresden, Germany. Director: Dr. Markus Bär.
- 1996. RESEARCH GRANT from the Royal Swedish Academy.
- 1994–1997. DOCTORATE scholarship from Dept. Quantum Chemistry, Uppsala University, Sweden. Director: Dr. Mario Natiello.
- 1992–1994. Research scholarship from Swedish Institute, Dept. Quantum Chemistry, Uppsala University, Sweden. Director: Dr. M. Natiello.
- 1991. Student scholarship from School of Exact and Natural Sciences–University of Buenos Aires, Argentina. Director: Dr. Hernán G. Solari.

Brief Research Statement

- Nonlinear dynamics. Bifurcation theory and dynamical systems analysis, both in low and high dimensional systems:
 - global bifurcations in laser with injected signal model
 - pulse dynamics in reaction-diffusion equations (Fitzhugh-Nagumo type and complex Ginzburg-Landau equation).
- Applications in sociology and economics:
 - Herding effect in financial markets. See press releases *Nature*, *Physical Review Focus*, *diario El País*, *Cinco Días*, *La Gaceta de los Negocios*, *Clarín*.
 - Evolutionary Game Theory: study of a Prisoners Dilemma with local interactions and an evolving network. This work has been presented in several conferences.

For more information refer to <http://www.nld.df.uba.ar/>.

Publications

PHYSICS JOURNALS: 15 articles. Last five years:

1. M. G. Zimmermann, V. M. Eguíluz [2005]; “Cooperation, social networks, and the emergence of leadership in a prisoner’s dilemma with adaptive local interactions ”, *Physical Review E* **72**, 056118 (2005).
2. M. G. Zimmermann, V. M. Eguíluz, M. San Miguel [2004]; “Coevolution of dynamical states and interactions in dynamic networks”, *Physical Review E*, **69**, 065102(R).
3. M. G. Zimmermann, M. A. Natiello, H. G. Solari [2001]; “Global bifurcations in a Laser with injected signal: beyond Adler’s approximation”, *Chaos* **11** (3), 500–513 (2001).
4. V. M. Eguíluz, M. G. Zimmermann [2000]; “Transmission of Information and Herd Behavior: an Application to Financial Markets”, *Physical Review Letters*, **85**, 5659. *Notas de prensa en Nature*, *diario El País*, *Cinco Dias*, *La Gaceta de los Negocios*.

SOCIO-ECONOMICS JOURNALS:

- V. M. Eguíluz, M. G. Zimmermann, C. J. Cela-Conde, M. San Miguel [2005]; “Cooperation and the Emergence of Role Differentiation in the Dynamics of Social Networks”, *American Journal of Sociology* **110** (4), 977–1008.

CHAPTERS OF BOOKS:

MG Zimmermann, VM Eguíluz, M San Miguel: "Cooperation, adaptation and the emergence of leadership", en "*Economics with Heterogeneous Interacting Agents*", (eds.) A. Kirman and J-B Zimmermann, Lecture Notes in Economics and Mathematical Series N503, pp. 73–86, Springer (2001).

BIOLOGICAL JOURNALS:

1. E. Burgos, H. Ceva, R. P. J. Perazzo, M. Devoto, D. Medan, M. Zimmermann, A. M. Delbue [2007]; "Why nestedness?", *J. of Theoretical Biology*, accepted.
2. D. Medan, R. P. Perazzo, M. Devoto, E. Burgos, M. G. Zimmermann, H. Ceva, A. M. Delbue [2007]; "Analysis and assembling of network structure in mutualistic systems", *J. of Theoretical Biology*, **246**, 510.
3. M. Devoto, M. G. Zimmermann, D. Medan [2007], "Robustness of plant-flower visitor webs to simulated climate change", *Ecología Austral* **17** (1), in press.

Conferences

PHYSICS

- PLENARY TALK: "Redes Evolutivas en Econofísica: Dilema del Prisionero y Mercados Financieros". 86 Reunión Nacional de Física, Asociación Física Argentina, IFIR (CONICET-UNR), Rosario, Santa Fe, 18–21 September 2001.
- TALK. 6th SIAM "Applications of Dynamical Systems" (2001, Utah, USA)
- POSTER. Euroconference on Trends in Optical Nonlinear Dynamics COCOS (1999, Munster, Germany)
- TALK. Física Estadística 99 (1999, Santander, Spain)
- POSTER. 4th SIAM "Applications of Dynamical Systems" (1997, Utah, USA)
- TALK. Euroconference "From Finite to Infinite dimensions dynamical systems" (1995, Cambridge, UK)
- TALK. MEDYFINOL (1993, Mar del Plata, Argentina).

ECONOMICS

- INVITED TALK. Jornadas de la Academia Nacional de Ciencias Exactas y Naturales, y Academia Nacional de Economía, (2004)
- INVITED TALK. Jornadas de Economía Matemática y Teoría Econométrica, (2003, Universidad de San Andrés)
- INVITED TALK. 1st Workshop in Computational Economics, (2001, Universidad Argentina de la Empresa, Argentina)
- TALK. 7th Conference of the Society of Computational Economics (2001, Yale University, USA)
- TALK. ASSET'99, The Eitan Berglas School of Economics (1999, Tel Aviv, Israel)

Master Thesis supervision:

- Alejo Salles, "Oscillations in a network with recurrent infections". Received Licenciatura April 2004.
- Matías Trivisan, "T-point bifurcations in a reaction diffusion equation". Due December 2005.

Teaching

Teaching assistant:

- Nonlinear Dynamics, (2000), (2004).
- Classical Mechanics, (2001).
- Biophysics, (2001), (2002), (2003).
- Physics I, (2002).

Other

- **IN THE MEDIA:**

- *Clarín (suplemento iEco)*: ² "De Salazar a Kevin Bacon: la ecuación del marketing viral", 5 Ago 2007.
- *Página 12*: ³ "El hombre de la Bolsa" i/a, 4 Jul 2007.

The following paper was focused in the media:

*V. M. Eguíluz, M. G. Zimmermann [2000]; "Transmission of Information and Herd Behavior: an Application to Financial Markets", *Physical Review Letters*, **85**, 5659.*

- *Physical Review Focus*: "Stock Market: Follow the Leader", **6** story #28, Dec. 22, (2000)⁴.
- *Nature (Science Update)*: "phenomena : Stockbrokers may act like sheep", Jan. 3, (2001)⁵.
- *Clarín*: "El mercado va en manada", Mar. 18, Suplemento Económico, (2001)⁶.
- *Discover (USA)*, June 11, 2001.
- *BBC Radio "Science at Nine"*.
- *El País*: "Un estudio compara el comportamiento de los 'brokers' con el de una manada", Jan. 16, (2001)⁷.
- *Cinco Días*: "El comportamiento gregario condiciona las Bolsas", (contratapa) Jan. 16, (2001)⁸.

- **Journal Reviewer:**

- Science
- Physica D & Physica A, Elsevier, Amsterdam.
- Journal of Economics and Behavioural Organizations

- **Languages:** Spanish (mother tongue); English (fluent); Swedish (fluent).

- **Programming:** C, Fortran, Matlab, Mathematica, Maple, IDL, PERL. Unix operating system.

- **References:** Prof. Maxi San Miguel, IMEDEA-UIB, Mallorca, (Spain); Prof. Mario Natiello, Univ. de Lund, (Sweden); Dr. Markus Bär, Max Planck Institute for Complex Systems, Dresden, (Germany); Prof. Hernán Solari and Prof. Gabriel Mindlin, FCEN-UBA, (Argentina).

- **Extra activities:** Football, golf, tango dance, yathing, squash, piano.

²<http://www.ieco.com.ar/notas/2007/08/05/01471026.html>

³<http://www.pagina12.com.ar/diario/ciencia/index-2007-07-04.html>

⁴<http://focus.aps.org/v6/st28.html>

⁵<http://www.nature.com/nsu/010104/010104-1.html#>

⁶<http://ar.clarin.com/suplementos/economico/2001-03-18/n-01101.htm>.

⁷<http://www.elpais.es/p/d/20010116/economia/manada.htm>

⁸<http://www.cincodias.es/scripts/cincodias/noticias/articulo.asp?ntc=193811&ap=9>