BERNARDO GABRIEL MINDLIN
CURRICULUM VITAE

Personal Data:
Address: Physics Department, FCEyN, University of Buenos Aires, C. Universitaria, Pab I, Buenos Aires
Phone: 54-011-4576-3390 (ext. 822); **e-mail:** gabriel@birkhoff.df.uba.ar
Place and date of birth: Quilmes, Argentina; 09/02/63; **Nationality**: Argentine
Marital Status: married; **Children:** Julia and Ivan.

University Degrees:
- Ph. D. In Physics, Drexel University, Philadelphia (1991)
- Licenciado en Ciencias Físicas (Master), Universidad de La Plata, Argentina (1987)

Area of Interest:
Analysis and modeling of non linear systems, Biophysics, Birdsong.
Positions:
- Research Associate Physicist, INLS, University of California, San Diego, 2003-present
- Professor, Department of Physics, University of Buenos Aires, since August 1993.
- Researcher, CONICET (National Research Council), Argentina, since December 1993.
- Professor University of Navarra, Pamplona, Spain, October 1992 - July 1993.
- Chercheur associe, CNRS, France (May 1997- August 1997, Dec 2001-March 2002)
- Assistant Professor, University of Navarra, Pamplona, Spain, December 1991 - October 1992.
- Teaching Assistant, Drexel University, Philadelphia, July 1988 - December 1991.

Books:
Nonlinear Dynamics: a two way trip from Physics to Math, H. Solari, M. Natiello and G. B. Mindlin, IOP, London (1996)

Awards:
- **De Robertis** Award, Secretaría de Ciencia y técnica de la Nación Argentina , 1994.
- **Ernersto Galloni** Award, National Academy of Sciences (Argentina), 1997.
- **Senior Fellow**, Santa Fe institute, New Mexico, USA, 2002-2004

Selected works:
- "Classification of strange attractors by integers", G. B. Mindlin et al. Phys. Rev. Letters, 64, 2350 (1990)
- T. Gardner, G. Cecchi, M. Magnasco, R. Laje and G. B. Mindlin "Simple gestures for birdsongs", Phys. Rev. Letts. 87 art 208101 (2001)
- R. Laje and G. B. Mindlin, "Diversity within a birdsong", Phys. Rev. Letts., 89, 288102 (2002)

Patents: "Procedure for the recognition of the identity of a speaker through the reconstruction of his/her biometric features from the voice", inventors G. B. Mindlin, M. Trevisan and M. Eguía, property of the patent, CONICET; INPI (2000)

Reprints in books:
F. Papoff, A. Fioretti, E. Arimondo, G. B. Mindlin, H. Solari and R. Gilmore. "Structure of Chaos in the Laser with Saturable Absorber", Phys. Rev. Letts. 68 , 8, 1128-1131 (1992), in "Coping with Chaos", Edited by E. Ott, T. Sauer and J. Yorke, J. Wiley and Sons Inc, (1994).

Papers in international journals:

1 1 H. Vucetich, R. Mercader, G. Lozano, G.B. Mindlin, A. López García, J. Desimoni. "Mossbauer Null Redshift Experiment", Phys. Rev. D38 n. 10 (1988).

2 D.L. González, M.O. Magnasco, G.B. Mindlin, H. Larrondo and L. Romanelli. "Gyration Number and Topology of the Period Doubling Bifurcation", J. Opt. Soc. Am. B, 5 n. 5 (1988).
3 González, M.O. Magnasco, G.B. Mindlin, H. Larrondo and L. Romanelli. "A Universal Departure From the Classical Period Doubling Spectrum, Physica D 39 (1989).
4 G.B. Mindlin, X Hou, H. Solari, R. Gilmore and N.B. Tufillaro. "Classification of Strange Attractors by Integers", Phys. Rev. letts. 64 n. 20 (1990).
5 X. Hou, R. Gilmore, G.B. Mindlin and H. Solari. "An Efficient Algorithm for Fast O(NlnN) Box Counting", Phys. letts. A 151 n. 1,2 (1990).
6 C. Green, G.B. Mindlin, E. D'Angelo, H. Solari and J.R. Tredicce. "Spontaneous Symmetry Breaking in a Laser The Experimental Side", Phys. Rev. letts. 65 n. 25 (1990).
7 G.B. Mindlin, H. Solari, M. Natiello, R. Gilmore and X. Hou. "Topological Analysis of Chaotic Time Series Data From the Belousov Zhabotinskii reaction", J. Nonlinear Sci. 1 147-173 (1991).
8 F. Papoff, A. Fioretti, E. Arimondo, G.B. Mindlin, H. Solari and R. Gilmore. "Structure of Chaos in the Laser with Saturable Absorber", Phys. Rev. Letts. 68 , n. 8, 1128-1131 (1992).
9 E. D'Angelo, E. Izaguirre, G.B. Mindlin, G. Huyat, L. Gil, J. Tredicce. "Spatio Temporal Dynamics in the Presence of An Imperfect O(2) Symmetry", Phys. Rev. Letts. 68, n.25, 3702-3705 (1992).
10 G. B. Mindlin, R. Gilmore, "Topological Analysis and Synthesis of Chaotic Time Series Data", Physica D58, 229-242 (1992).
11 F. T. Arecchi, S. Boccaletti, G. B. Mindlin, C. Perez Garcia " Periodic Alternation in Systems with Imperfect Symmetry", Phys. Rev. Letts., vol. 69, number 26, 3723-3726 (1992)
12 G.A. Cecchi, D.L. González, M. Magnasco, G.B. Mindlin, O. Piro, A. Santillan, "Periodically Kicked Hard Oscillators", Chaos, vol. 3, number 1, 51 (1993).
13 R. Lopez Ruiz, G. B. Mindlin, C. Perez Garcia, J. Tredicce, "A Mode-Mode Interaction for a CO2Laser with Imperfect O(2) Symmetry", Phys. Rev. A, vol. 47, number 1, 500-509 (1993).
14 T. Ondarcuhu, G. B. Mindlin, H. Mancini, C. Perez Garcia, "Dynamical Patterns in Benard Marangoni Container with Square Symmetry", Phys. Rev. Letts., vol. 70, 3892-3895 (1993).
15 G. B. Mindlin, R. Lopez-Ruiz, R. Gilmore and H. Solari, "Horseshoe Implications", Phys. Rev. E, {\bf 48} 4297 (1993)
16 G. B. Mindlin, Ondarcuhu, H. Mancini, C. Perez Garcia, A. Garcimartin, "Comparison of Data from Benard-Marangoni Convection in a Square Container with a Model Based on Symmetry Arguments" IJBC, 4(5) 1121-1134 (1994)
17 Boyd, G. B. Mindlin, R. Gilmore and H. Solari, "Topological Analysis of Chaotic Orbits: Revisiting Hyperion", Ast. Journal, vol. 431 425 (1994)
18 T. Ondarcuhu, G. B. Mindlin, H. Mancini, C. Perez Garcia, "Chaotic Evolution of Patterns in Benard Marangoni Convection with Square Symmetry", J. of Physics (condensed matter), {\bf 6} A427 (1994)
19 Lopez Ruiz, G. B. Mindlin, C. Perez Garcia, J. Tredicce, "Nonlinear Interaction of Transversal Modes in a CO2 Laser", Phys. Rev. A, 49, 4916 (1994)
20 M. Huerta, D. Krmpotic, G. B. Mindlin, H. Mancini, D. Mazza, C. Perez "Dynamics of Patterns in a Benard Marangoni Experiment", Physica D, vol. 96 200 (1996)
21 G. B. Mindlin and H. G. Solari, "Topologically Inequivalent Embeddings", Phys. Rev. E, 52, 1497 (1995)
22 D. Krmpotic, G. B. Mindlin and C. Perez Garcia," Benard Marangoni Convection in Square Containers", Phys. Rev. E, 54, 3609 (1996)
23 G. B. Mindlin, H. G. Solari, "Torii and Klein Bottles in 4 Dimensional Chaotic Flows", Physica D,102, 177 (1997)
24 Mancho, A. Duarte, G. B. Mindlin, "Time Delays Embeddings and the Structure of Flows, Physics Letters A, 221 (3,4), 181, 1996
25 H. G. Solari and G. B. Mindlin, "Quasicrystals and Strong Interactions between Square Modes", Phys. Rev. E, 56, 1853, (1997)
26 D. Krmpotic and G. B. Mindlin, "Truncations of the Bi-orthogonal Decomposition: what is preserved?", Phys. Letts. A, 236, 301 (1997)
27 G. B. Mindlin, N. Merener, P. T. Boyd, "Low Dimensional Dynamics outside the Laboratory: the case of Stellar Pulsations", Europhys. Letts., 42, 1,(1998)
28 M Eguia, G. B. Mindlin, M. Giudici, "Are the Low Frequency Fluctuations in Semiconductor lasers with feedback induced with noise?" Phys. Rev. E, 58, 2636 (1998)

29 G. B. Mindlin et al., "Dynamical model to describe low frequency fluctuations in semiconductor lasers", Physica A. 257, 547 (1998)
30 Yacomotti, O. Martinez, G. B. Mindlin, "Quantitative information from time series: Cr:yttrium-aluminum-garnet cross-section measurement", Phys. Rev. A, in press (scheduled for A01jly 99) (1999)
31 M. Eguia, G. B. Mindlin, "From excitability to determinism in low frequency fluctuations", Phys. Rev. E., 60 (2) 1551-1557 (1999)
32 D. Sciamarella and G. B. Mindlin, "Topological structure of chaotic flows from human speech chaotic data", Phys. Rev. Letters, 82, 1450 (1999)
33 Yacomotti, M. Eguia, J. Aliaga, O. Martinez, G. B. Mindlin, and A. Lipsich, "Interspike time distribution in noise driven excitable systems", Phys. Rev. Letts., 83 (2) 292-295 (1999)
34 D. Strier, A. Duarte, H. Ferrari and G. B. Mindlin, "Nitrogen stars: Morphogenesis of a liquid drop", Phys. Rev. . Physica A 283 262-266 (2000)
35 Eguia M. C. Y G. B. Mindlin, "Distribution of Interspike times in noise driven excitable systems", Phys. Rev. E., 61, 6490-6499 (2000)
36 Sigman M. And G. B. Mindlin " Dynamics of three coupled excitable cells with D3 symmetry", IJBC, 10, 1709-1728 (2000)
37 P. Mininni, D. Gomez and G. B. Mindlin, "Stochastic Relaxation Oscillator Model for the Solar Cycle", Physical Review Letters, 85, 5476 (2000)
38 Trevisán M., Eguía M., Mindlin G. B., "Nonlinear aspects of análisis and síntesis of speech time series", Phys,. Rev. E 6302 6216 (2001).
39 Mendez J., Laje R., Aliaga J., Giudici M. And G. B. Mindlin, "The dynamics of periodically forced semiconductor lasers with optical feedback", Phys. Rev. E, 63 art 66218 (2001)
40 Sciamarella D., Mindlin G. B., "The structure of chaotic flows", Phys. Rev. E 64 036209 (2001)
41 P. Mininni, D. Gomez and G. B. Mindlin, " A Model for the Solar Cycle", Solar Physics 201 203-223 (2001)
42 R. Laje, T. Gardner and G. B. Mindlin, "The effect of feedback in the dynamics of the vocal folds", Phys Rev. E, 64 art 056201 (2001)
43 T. Gardner, G. Cecchi, M. Magnasco, R. Laje and G. B. Mindlin "Simple gestures for birdsongs", Phys. Rev. Letts. 87 art 208101 (2001)
44 M. C. Eguia, S. Ponce Dawson and G. B. Mindlin, "Computing with excitable systems in a noisy environment", Phys. Rev. E **65** art 047201 (2002)
45 A. Ventura, G. B. Mindlin and S. Ponce Dawson, "A generic model for 2d excitability", Physical Review E, 65, 046231 (2002)
46 A. Yacomotti, G. B. Mindlin, M. Giudicce, J. Tredicce et al., "Coupled optical excitable cells" Phys. Rev. E 66, 036227 (2002)
47 R. Laje, T. Gardner and G. B. Mindlin, "Neuromuscular control of vocalization in bird song: a model", Phys. Rev. E 65, 051921 (2002)
48 P. Mininni, D. Gomez, G. B. Mindlin, "Bi orthogonal decomposition unveils the nature of irregularities in the sun spot numbers" Phys. Rev. Letts. 89, 061101 (2002) cover, 5th august 2002
49 Jorge M. Mendez, J. Aliaga, and G. B. Mindlin, "Topologically inequivalent orbits induced by noise", J. Mendez, J. Aliaga and G. B. Mindlin, Phys. Rev. Letts. , 89, 160601 (2002)
50 R. Laje and G. B. Mindlin, "Diversity within a birdsong", Phys. Rev. Letts., 89, 288102 (2002)
51 J. Aliaga, N. Busca, V. Minces, G. B. Mindlin, B. Pando, A. Salles and L. Szsupak, "Electronic neuron within a ganglion of a leech (Hirudo Medicinalis)" Phys. Rev. E 67, art 061915 (2003)
52 G. B. Mindlin, T. Gardner, F. Goller, R. Suthers, "Experimental test of a model for birdsong production", Phys. Rev. E, submitted (2003)
53 R. Laje and G. B. Mindlin, "Highly structured duets in the song of the South American Hornero", Physical Review Letters, submitted (2003)

Consulting:

1. Argentine Secretary of State, "The sound impact of touristic flights by Brazilian helicopters at Iguazu National Park", technical report (2001).
2. Judge Bonadio "Test over edition of tapes", technical report (2002)

Direction of Students, Scholars and Researchers:

- *Darío Krmpotic, Ph. D.* La Plata University (2000)
- *Denisse Sciamarella, Ph. D.,* University of Buenos Aires (2001)
- *Manuel Eguia*, Ph. D University of Buenos Aires (2002)
- Rodrigo Laje, Ph. D. thesis in progress
- *Alejandro Yacomotti*, Ph. D. University of Buenos Aires (2002)
- Marina Huerta, Master thesis (1994), University of Buenos Aires
- José Caminos, Master thesis (1995), La Plata University
- Nicolás Merener, Master thesis (1997), University of Buenos Aires
- Mariano Sigman, Master thesis (1997), University of Buenos Aires
- Manuel Eguia, master thesis (1998), University of Buenos Aires
- Alejandro Yacomotti, Master thesis (1998) University of Buenos Aires
- Marcos Trevisán, Master thesis (2000), University of Buenos Aires
- Jorge Brea, Master Thesis (2002), University of Buenos Aires
- Pablo Jercog, Master Thesis (2002), University of Buenos Aires
- Ana Macho, Ph. D student from University of Navarra, invited researcher (1996)
- Tim Gardner, Ph. D. Student from Rockefeller University, invited researcher (2000)

Conference Presentations in the last years:

1. Measures in Spatio Temporal Complexity, Bryn Mawr, USA 1995, "Low dimensional chaos in a Benard Marangoni Convection Experiment", G. B. Mindlin.
2. Chaos in Gravitational N-Body Systems, La Plata, Argentina, 1995. "Topological Analysis of Data", G. B. Mindlin and P. Boyd (Invited talk)
3. Medyfinol-96, Tucuman, September 1996, From Time Series to Physical Models: the Case of a Pulsating star, G. B. Mindlin (Invited talk)
4. Instabilities and Nonequilinbrium Structures, Valparaiso, Chile (1997), "RoAp pulsating stars" (Invited talk)
5. LAWNP 99, Cordoba, October 1999 (Invited talk "Logic gates using noise driven excitable units".
6. SIAM dynamical systems meeting, Snowbird, Utah (USA), May 1999 (co organizer of a mini symposium , presentation of "Interspike Time Distribution in Noise Driven dynamical Systems").
7. SIAM dynamical systems meeting, Snowbird, Utah (USA), May 2001, Contributed presentation, "simple motor gestures in birdsong", T. Gardner and G. B. Mindlin
8. Society for Neuroscience´s 31 annual meeting, San Diego, California, November 10 2001, T. Garner, G. Cecchi, M. Magnasco, R. Laje and G. B. Mindlin, "Simple motor gestures in birdsong"
9. Rancontre du non lineaire 2002, I. H. Poincare, Paris, D. Sciamarella and G. B. Mindlin, "Technique d´homologie pour la description topologique de flots chaotiques", Rencontre du non lineaire 2002, 243-248 (2002)
10. School on Nonlinear dynamics, IMCB, Brasilia, 1-5 July 2002 (invited lecturer, course on Normal forms)
11. Plenary Talk, Argentinean association of Physicists, Huerta Grande, Sept. 2002, " The physics of Birdsong".
12. Argentinean Biophysical Society meeting, SAB 2002, Buenos Aires, 5 Dec, Plenary talk
13. Medyfinol 2002, 9-13 Dec 2002, Colonia, Uruguay, Invited talk
14. SIAM dynamical systems meeting, Snowbird, Utah (USA), May 2003, Contributed presentation "Diversity within birdsong"

Invited talks in the last five years

1. INSA, Rouen, France (1994) "Templates and Torii", invited by G. Gouesbett
2. University of Navarra, Spain (1994) "Hidden Symmetries", invited by C. Perez-Garcia
3. Universidad Complutense, Spain (1995) Dept. Of applied math. , invited by H. Herrero
4. INLN, Nice invited by J. Tredicce (1996)
5. U. de Navarra, invited by H. Mancini (1997)

6. KTH, Universitet Stockholms, invited by M. Natiello (1997**)**
7. Princeton University, Applied Math. Department, Invited by P. Holmes (1999)
8. INLS, University of California at San Diego, (USA) invited by H. Abarbanel (1999)
9. I. Balseiro at Bariloche (ARG), invited by H. Wio (2000)
10. Drexel University (USA), invited by Michel Vallieres (2001)
11. INLN (Nice, France), invited by J. Tredicce (January 2002)
12. LIMSI (Orsay, France) invited by D. Sciamarella (February 2002)
13. UCSD, Neuroscience division, Department of Biology (USA), invited by Nick Spitzer (April 2003)
14. UCSD, INLS, (USA), Invited by H. Abarbanel.

Visits to other institutions in the last years

1. Insitute nonlineaire de Nice, France (January-march 2002)
2. Rockefeller University, Center for Physics and Biology (2001)
3. Drexel University, Physics Department (2001)
4. Rockefeller University, Center for Physics and Biology (2000)
5. Princeton University, Department of applied mathematics (1999)
6. University of California at San Diego, Institute for Nonlinear Science (1999)
7. Universidad de Navarra, Department of Physics and Applied Mathematics (1997)
8. Uppsala University, Dept. of Quantum Chemistry (1997)
9. University of Nice, INLN (1997)

Organization of events or conferences

1. Argentine-French school of Nonlinear dynamics and lasers (I) 1996. Courses by J. Tredicce and P. Coullet
2. Argentine-French school of Nonlinear dynamics and lasers (II) 1998. Courses by J. Tredicce and S. Balle
3. Minisymposium "Observation, analysis and modeling of excitable systems", in the SIAM conference on Applications of Dynamical systems, Utah (1999)
4. Third Giambiagi school of Physics, Physics Department, University of Buenos Aires (Physics and Biology). Courses by A. Winfree, H. Abarbanel, R. Do Santos and W. Kristan, July 2001.

Review Tasks

- Referee for Physical Review Letters, Physical Review A, Physical Review E, Physica D, Optics Communications, Chaos, International Journal of Bifurcations and Chaos, Proc. Royal Soc. Of Sci., biology.
- Member of Ph. D. Thesis Jury: C. Letellier (U. De Paris VII), M. Zimmermann (Uppsala University), M. J. Sanchez (UBA), S. Gatica (UBA), E. Vergini (UBA), F. Simonotti (UBA), G. Carlo (UBA), H. Castellini (U. Rosario), A. Duarte (CAB, Balseiro)
- Member of the Faculty Committee to hire Assistant professors (JTP) at UBA (1998)
- Member of the Faculty Committee to hire Assistant professors (JTP) at UBA (2002)
- Reviewer for the Agencia Nacional de Promoción Científica, Argentina (1999-2000-2001)
- Member of the committee at CONICET to grant doctoral and postdoctoral scholarships (1999-2000, 2000-2001, 2001-2002)
- Member of the committee at University of Quilmes to grant UNQ research grants (2000, 2001, 2002)
- Member of the committee at University of Quilmes in charge of deciding on the promotions of their Faculty (2000)

Institutional participation

- Faculty member of the advisory board of the Physics Department (FCEN, UBA) (1996-1998, 1998-2000)
- Faculty committee member of the board running the Graduate Program of the School of Science (FCEN) University of Buenos Aires (2001-present)

References:

- Michel Vallieres, Chairman, Physics Department, Drexel University, Philadelphia
- Robert Gilmore, Physics Department, Drexel University, Philadelphia
- Hector Mancini, Chairman, Physics Department, University of Navarra, Pamplona, Spain
- Henry Abarbanel, Chairman, INLS, UCSD, San Diego
- Phil Holmes, Chairman applied math, Princeton University

Press Clippings

- **Nature Science Update**, 2 nov 2001, "Canaries change their tune" by P. Ball
- **Physics News update,** 14 Nov 2001," Singing Like a Canary" by Phil Schewe, James Riordon, and Ben Stein
- **Mathematical American association, Math trek,** Canary Songs, by Ivars Peterson, November 26, 2001
- **New Scientist,** 10 Nov. 2001
- **New Scientist,** by Muir 8 **January 2003** (on the work "Diversity within a birdsong", PRL 89, 288102)
- **Physical Review Focus, 8 January 2003,** by JR Minkel, "Deconstructing Birdsong", on the work "Diversity within a birdsong")
- **AAS science hour,** broadcasted on Feb 2003
- **On the same work: ABC news, CNN, Reuters, Boston Globe, Clarin, Granma and others.**