

BERNARDO GABRIEL MINDLIN
CURRICULUM VITAE

Bernardo Gabriel Mindlin

Address: Depto. Física, FCEyN, Universidad de Buenos Aires, C. Universitaria, Pab I, Buenos Aires

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Place and date of birth: Quilmes, Argentina; 09/02/63; **Nationality:** Argentine

Married to: Silvia Loza ; **kids:** Julia, Iván.

Studies:

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

Areas of interest:

Analysis and modeling of nonlinear systems. Applications to biophysics. Physics of birdsong.

Employment:

- Professor, Physics Department, FCEyN, Universidad de Buenos Aires, from August 1993.
- Researcher of CONICET, Argentina, from December 1993 (Principal Investigator).
- Research Associate Physicist, INLS, University of California, San Diego, 2003-2004
- Professor, Universidad de Navarra, Pamplona, España, October 1992 - July 1993.
- Chercheur associe, CNRS, France (May 1997- August 1997, Dec 2001-March 2002)
- Assistant Professor, University of Navarra, Pamplona, Spain, Diciembre 1991 - Octubre 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)

The Physics of Birdsong, Gabriel B. Mindlin, Rodrigo Laje, Springer, Heidelberg ISBN 3-540-25399-8 (2005)

Causas y Azares: historia del caos y los sistemas complejos, Gabriel Mindlin, Editorial Siglo XXI, Bs As, Argentina, colección Ciencia que Ladra (2008).

Awards:

- **De Robertis**, Secretaría de Ciencia y técnica de la Nación Argentina , 1994.
- **Ernersto Galloni**, Academia Nacional de Ciencias Exactas y Naturales (Argentina), 1997.
- **Senior Fellow**, Santa Fe institute, New Mexico, USA, 2002-2004
- **Premio estímulo Científico Joven, Fundacion Bunge y Born 2004**
- **Arthur Taylor Winfree award, ICTP, Trieste 2004**
- **Fellow AAAS, 2010.**

Advisor of the following PhD thesis.

1. “Mecanismos de transición a la complejidad espacio-temporal en fluidos”: 10/05/2000, Darío Krmpotic, UNLP.
2. “Estructura topologica de flujos caóticos”: 6/6/2001. Denisse Sciamarella, UBA.
3. “Sistemas Ópticos Excitables”: 12/12/2002, Alejandro Yacomotti, UBA.
4. “Estadística y procesamiento de información en sistemas excitables con ruido”: 10/10/2002, Manuel Eguia, UBA.
5. “Generalización de la resonancia estocastica”, 14/12/2004, J. Mendez, UBA
6. “La física del canto de las aves”, Laje, R. 01/10/2005, UBA

7. "Producción de voz, control neuronal y biometría", Marcos Trevisan, 26 de julio de 2006
8. "Efectos no lineales en la generación del canto de las aves", Ana Amador, UBA, mayo 2009
9. "Efectos hormonales en la maduración del canto de las aves", Jorge Alliende, 10/2/2010
10. "Biomimética vocal", Jacobo Sitt, 15/2/2010, UBA

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)
- G. B. Mindlin, T. Gardner, F. Goller, R. Suthers, "Experimental test of a model for birdsong production", *Phys. Rev. E*, **68**, 041908 (2003)
- R. Laje and G. B. Mindlin, "Highly structured duets in the song of the South American Hornero", *Physical Review Letters*, **91**, 258104 (2003)

Patents:

1. "Topological voiceprints for speaker identification", G. B. Mindlin, M. Trevisan, and M. Eguía, UCSD-UBA-UNQ Patent application filled by UCSD, application number 60/497,007 Priority date, Aug 20, 2003. August 20, 2004.
2. "Procedimiento para el reconocimiento de la identidad de un hablante por medio de la reconstrucción de propiedades ergonomicas mediante el uso de la voz", inventores G. B. Mindlin, M. Trevisan and M. Eguía, CONICET; INPI, Argentina, 22 diciembre 2009, Nro. AR 047710 B1

Articles reprinted 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).

Articles in refereed journals:

- 1 H. Vucetich, R. Mercader, G. Lozano, G.B. Mindlin, A. López García, J. Desimoni. "Mossbauer Null Redshift Experiment", *Phys. Rev. D* **38** 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. Tuffillaro. "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 $O(N \ln N)$ 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 D* **58**, 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. Krmptic, 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. Krmptic, 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. Krmptic 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. Giudice, 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. Mincec, G. B. Mindlin, B. Pando, A. Salles and L. Szsapak, "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*, 68, 041908 (2003)
- 53 R. Laje and G. B. Mindlin, "Highly structured duets in the song of the South American Hornero", *Physical Review Letters*, 91, 258104 (2003)
- 54 H. Abarbanel, L. Gibb, G. B. Mindlin, S. Talathi, "Mapping neural architectures onto acoustical features of birdsong", *J. Neurophysiol* 92:96-110 (2004)
- 55 H. Abarbanel, L. Gibb, G. B. Mindlin, M. Rabinovich, S. Talathi, "Spike Timing and Synaptic plasticity in pre-motor pathway of birdsong", *Biological Cybernetics* 3, 1-9 (2004).
- 56 H. Abarbanel, S. Talathi, G. B. Mindlin, M. Rabinovich, L. Gibb, "Dynamical model of birdsong maintenance and control" 051911, 1-16, *Phys. Rev. E* 70 (2004)
- 57 S. Bouzat, H. Wio and G. B. Mindlin, "Characterization of spatiotemporal chaos in an inhomogeneous active medium", *Physica D* 199, 185-193 (2004) 1.
- 58 Limits on the excitable behavior of a semiconductor laser with optical feedback
J. M. Méndez, J. Aliaga, and G. B. Mindlin, *Phys. Rev. E* 71, 026231 (2005)
- 59 Trevisan M., Eguia M. and Mindlin G. B., "Topological voiceprints for speaker identification", *Physica D* 200, 75-80 (2005).
- 60 P. E. Jercog, M. A. Trevisan, G. B. Mindlin, *Physica A*, Subharmonics in the solutions of a model of the song motor nuclei in songbirds, 145-150, 356, 2005
- 61 M. A. Trevisan, S. Bouzat, I. Samengo, G. B. Mindlin, *Physical Review E*, Dynamics of learning in coupled oscillators tutored with delayed reinforcements, 011907-1/7, 72, 2005
- 62 A. Amador, M. A. Trevisan, and G. B. Mindlin. Simple neural substrate predicts complex rhythmic structure in duetting birds. *Phys. Rev. E* 72, 031905 (2005)
- 63 Zysman D., Méndez J., Aliaga J and G. B. Mindlin, "Synthesizing birdsong", *Phys. Rev. E*, 72, 261-264 (2005)
- 64 R. Laje and G. B. Mindlin, *Physical Review E*, "Modeling source-source and source-filter acoustic interaction in birdsong". Volumen 72 036218 (2005)
- 65 A. Granada^a, M. Gabitto^a, G. García^a, J. Allende^a, J. Méndez^a, M.A. Trevisan^a and G.B. Mindlin, *Physica A: Volume 371, Issue 1*, 84-87, The generation of respiratory rhythms in birds (2006)
- 66 M. Trevisan, G. B. Mindlin and F. Goller, Nonlinear model predicts diverse respiratory patterns of birdsong, *Phys. Rev. Letts*, 96, art 054102 (2006)

- 67 Respiratory patterns in oscine birds during normal respiration and song production
M. A. Trevisan, J. M. Mendez, and G. B. Mindlin
Phys. Rev. E **73**, 061911 (2006)
- 68 Dynamical systems techniques reveal the sexual dimorphic nature of motor patterns in birdsong
J. M. Mendez, J. A. Alliende, A. Amador, and G. B. Mindlin
Phys. Rev. E **74**, 041917 (2006)
- 69 The constraints to learning in birdsong, Trevisan M and G. B. Mindlin, Europhysics J., 146, 199-204 (2007)
- 70 Lateralization as a symmetry breaking process in birdsong, Trevisan M, Cooper B, Goller F and Mindlin G. B., Physical Review E, Phys. Rev. E **75**, 031908 (2007)
- 71 Bilateral source acoustic interaction in a syrinx model of an oscine bird, Rodrigo Laje, Denisse Sciamarella, Juan Zanella, and Gabriel B. Mindlin, Phys. Rev. E **77**, 011912 (2008)
- 72 The dynamical origin of physiological instructions used in birdsong production, E. Arneodo, L. Alonso, J. Alliende and G. B. Mindlin, Prana 70, 6, 1-9 (2008)
- 73 Frequency modulation during song in a suboscine does not require vocal muscles, A. Amador, F. Goller and G. B. Mindlin, J. Neurophysiol., 99, 2383-2389 (2008)
- 74 Dynamical origin of spectrally rich vocalizations in birdsong, J. D. Sitt, A. Amador, F. Goller, and G. B. Mindlin, Phys. Rev. E **78**, 011905 (2008)
- 75 Beyond Harmonic Sounds in Birdsong, A. Amador and G. B. Mindlin, CHAOS **18**, 043123 1-6 (2008)
- 76 New Perspectives on the physics of Birdsong, M. A. Trevisan and G. B. Mindlin, *Phil. Trans. R. Soc. A* **28 August 2009 vol. 367 no. 1901 3239-3254** (2009)
- 77 Neurophysiological Bases of Exponential Sensory Decay and Top-Down Memory Retrieval: A Model. Ariel Zylberberg,¹ Stanislas Dehaene,^{2,3*} Gabriel B. Mindlin,¹ and Mariano Sigman¹ Front Comput Neurosci. 2009; 3: 4 (2009)
- 78 Low-dimensional dynamical model for the diversity of pressure patterns used in canary song, Leandro M. Alonso,¹ Jorge A. Alliende,¹ F. Goller,² and Gabriel B. Mindlin¹, Phys. Rev. E **79**, 041929 (2009)
- 79 Source-tract coupling in birdsong production, Ezequiel M. Arneodo and Gabriel B. Mindlin, Phys. Rev. E **79**, 061921 (2009)
- 80 Physiologically driven avian vocal synthesizer, Jacobo D. Sitt, Ezequiel M. Arneodo, Franz Goller, and Gabriel B. Mindlin Phys. Rev. E **81**, 031927 (2010)

Consulting:

1. Argentine Secretary of State and Wild Life Foundation, "The sound impact of turistic helicopters in the Iguazu Falls National Park", Technical report (2001).
2. Judge Dr. Bonadio, "Identification of editions in a recorded tape", Technical report (2002)

Direction of students and researchers:

Ph D, defended

- *Dario Krmpotic*, Ph. D. UNLP (2000)
- *Denisse Sciamarella*, Ph. D., U. Buenos Aires (2001)
- *Manuel Eguia*, Ph. D U. Buenos Aires (2002)
- *Alejandro Yacomotti*, Ph. D. U. Buenos Aires (2002)
- *Jorge Mendez*, Ph. D U. Buenos Aires (2004)
- *Rodrigo Laje*, Ph. D. Buenos Aires (2005)
- *Marcos Trevisan*, Ph. D., Buenos Aires (2006)
- *Ana Amador*, Ph. D, Buenos Aires (2008)

- Jorge Allinede, Ph. D, BsAs (2010)
- Jacobo Sitt, Ph.D, BsAs (2010) 15/02/2010 biomimetica vocal

Master thesis, defended

- Marina Huerta, tesis de licenciatura (master thesis) (1994), U. Buenos Aires
- José Caminos, tesis de licenciatura (master thesis) (1995), UNLP
- Nicolás Merener, tesis de licenciatura (master thesis) (1997), U. Buenos Aires
- Mariano Sigman, tesis de licenciatura (master thesis) (1997), U. Buenos Aires
- Manuel Eguía, tesis de licenciatura (master thesis) (1998), U. Buenos Aires
- Alejandro Yacomotti, tesis de licenciatura (master thesis) (1998) U. Buenos Aires
- Marcos Trevisán, tesis de licenciatura (master thesis) (2000), U. Buenos Aires
- Jorge Brea, tesis de licenciatura (master thesis) (2002), U. Buenos Aires
- Pablo Jercog, tesis de licenciatura (master thesis) (2002), U. Buenos Aires
- Adrián Granada, tesis de licenciatura (master thesis) (2005)
- Ana Amador, tesis de licenciatura (master thesis) (2004)
- Adrián Granada, tesis de licenciatura (master thesis) (2005)
- Jorge Allende, tesis de licenciatura (master thesis) (2006)
- Mariano Gabitto, tesis de Licenciatura (master thesis) (2007)
- Leandro Alonso, master thesis (master 2007)

Students of advanced labs, defended.

- Victor Minces, Bernardo Pando and Nicolás Busca (students of advanced laboratory) (2003)
- Guadalupe Garcia and Mariano Gabitto (students of advanced laboratory) (2005)
- Gervasio Puertas, Leandro Alonso (Estudiantes de laboratorio 6 y 7) (2006)

Invited Researchers, and post docs

- Ana Macho, Ph. D student from University of Navarra, invited researcher (1996)
- Tim Gardner, Ph. D. Student from Rockefeller University, invited researcher (2000)
- Laje R, JTP (2006)
- Mendez Jorge (post doc, CONICET2006)

Students (Ph. D. and master thesis) with work in progress

- Ezequiel Arneodo, Ph.D thesis in progress (2010)
- Leandro Alonso, PhD thesis in progress (2010)
- Yonatan Sanz, Ph. D. Thesis in progress (2010)
- Matías Goldin, Ph. D. In progress (2010)

Presentations in conferences 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 Nonequilibrium 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. Rencontre 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"
15. Meeting of the NE-Brasilian society of Physics, Plenary talk, Nov. 2003.
16. Internacional conference on voice physiology and biomechanics: modelling ocmplexity. Marsella. Aug. 2004
17. Workshop TOCS, Porto Alegre, Brasil agosto 2004 (charla invitada "Physics and neural control of birdsong")
18. Medyfinol 2004, La Serena, Chile, December 5-10, 2004 (invited talk: Sub harmonics and rhythms in birdsong)
19. Lawnp 05, Bariloche, Oct. 2005, (invited talk "Complexity of behavior with simple neural sustrates in birdsong")
20. X congress of the Panamerican Association for Biochemistry and Molecular Biology, Pinamar, Argentina, Dec. 2005. "Synthesizing birdsong" (Zysman, Mendez, Aliaga and Mindlin)
21. 8vo TALLER ARGENTINO DE NEUROCIENCIAS
5 AL 9 DE ABRIL DE 2006, Córdoba, organizador de mini simposio (invitados, Goller F. and Margoliash D.)
22. Experimental Chaos conference, San Pablo, Brasil, 29/05/2006-01/06/2006. "Simple neural architectures leading to diversity in birdsong", with M. Trevisan.
23. PNLD, (Perspectives in Nonlinear Dynamics) Trieste (16-27 July 2007). Course "physics and neural control of birdsong" in the workshop, Invited speaker.
24. Neuroscience meeting, November 2007, San Diego, USA (presentation of two posters) (924.18/QQ8) Frequency control during song does not require syringeal muscles in the Great Kiskadee (Wednesday, Nov 7 2007 2:00 PM - 3:00 PM) *A. AMADOR¹, F. GOLLER², G. B. MINDLIN and (926.1/RR15) Constraints between motor patterns in birdsong (Wednesday, Nov 7 2007 1:00 PM - 2:00 PM), **G. B. MINDLIN**¹, J. A. ALLIENDE², A. AMADOR², J. M. MENDEZ², M. A. TREVISAN², F. GOLLER
25. Neurotaller, April 2008, La Falda, Cordoba, Argentina, (presentation of two posters)
26. 1st CAPES and ELS-IINN/UFRN Summer School, 2nd July, 29 August 2008, Natal, Brazil. Course on "The Physical and neural control of birdsong".
27. Summer school 2009, Physics Department UFPE, Recife, Brazil (February 2009), School on Nonlinear Dynamics
28. Neuroscience meeting, November 2008, Washington, USA, Mon, Nov 17, 4:00 - 5:00 PM
492.8/UU6 - Beyond harmonic sounds in a simple model for birdsong production , *A. AMADOR^{1,2}, J. D. SITT², F. GOLLER³, G. B. MINDLIN²
29. Invited talk, Meeting of the Acoustical Society of America, 18-22 May 2009, Portland, Oregon, USA.
3aSC2. Source-filter interactions in birds—Theory and experimental evidence. Gabriel Mindlin, Ezequiel Arneodo _Dept. of Phys., Univ. of Buenos Aires, gabo.mindlin@gmail.com_, and Franz Goller _Univ. of Utah, Salt Lake City, UT, goller@biology.utah.edu_
30. Neuroscience meeting, October 2009, Chicago, Mon, Oct 19, 3:00 - 4:00 PM
483.3/GG68 - Hormonal acceleration of song development in canaries, *J. ALLIENDE GONZALEZ¹, J. M. MÉNDEZ^{1,2}, F. GOLLER², G. B. MINDLIN¹;

Invited talks

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.
15. University of Chicago, invited by D. Margoliash, (October 2003)
16. Encontro de Fisica Nordeste Brasil – Fortaleza Brazil. (plenary talk) (November 2003.)
17. The physics of and neural control of Birdsong, IB, Centro atomico Bariloche, Oct. 2004
18. Escuela CAB-IB 2004 Bariloche, Argentina (Lecturer, course: the behavior as emergent of excitable systems) October 2004
19. INLN, Nice, invited by J. Tredicce (January 2005)
20. Techtips, UCSD "Voiceprints for voice identification", invited by Laura Wolszon, January 2005
21. Experimental and Computational Neurodynamics Summer School, August 15 - 26, 2005, UCSD, La Jolla, CA. A four lectures course for graduate students in neuroscience
22. Experimental Chaos conference, San Pablo, Brasil, invited lecture, 29/05/2006-01/06/2006
23. invited talk, 8th taller argentine de nuerociencias, Córdoba (2006)
24. BIOMAT, Córdoba, Argentina (2007). Birdsong and computational neuroscience.
25. BIOMAT, Córdoba, Argentina (2008). Low dimensional dynamics in the physiological gestures controlling birdsong.
26. Invited talk, Meeting of the Acoustical Society of America, 18-22 May 2009, Portland, Oregon, USA.

Visits to Institutions in the last years

1. University of Utah, Dept of biology, yearly 2005-2008
2. Institute Nonlinear Science, UCSD (January 2003-February 2004).
3. Insitute nonlineaire de Nice, France (January-march 2002)
4. Rockefeller University, Center for Physics and Biology (2001)
5. Drexel University, Physics Department (2001)
6. Rockefeller University, Center for Physics and Biology (2000)
7. Princeton University, Department of applied mathematics (1999)
8. University of California at San Diego, Institute for Nonlinear Science (1999)
9. Universidad de Navarra, Department of Physics and Applied Mathematics (1997)
10. Uppsala University, Dept. of Quantum Chemistry (1997)
11. University of Nice, INLN (1997)

Organization of Conferences and Schools

1. Argentine-French school of Nonlinear dynamics and lasers (I) 1996. Courses by J. Tredicce and P. Couillet
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.
5. 8vo TALLER ARGENTINO DE NEUROCIENCIAS
5 AL 9 DE ABRIL DE 2006, simposio (F. Goller, D. Margoliash)
6. PNL D, (Trieste, 2007) Internacional comité.

7. Dynamics Days (2008), Internacional advisory comité.
8. SAN-TAN (sociedad argentina de neuro ciencias- taller argentino de neurociencias), primera reunion conjunta 2009, comite organizador.

Referee and Committees

- 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.
- Jury in the PhD thesis of: C. Letellier (U. De Paris VII), M. Zimmermann (Uppsala University, 1993), A. Donofrio (1994), M. J. Sanchez (UBA, 1994), S. Gatica (UBA,1995), E. Vergini (UBA, 1995), V. Presa (UBA, 1996), P. Dmitruk (UBA, 1999), G. Carlo (UBA, 2000), H. Castellini (U. Rosario), A. Duarte (CAB, Balseiro), J. Aparicio (UBA, 1999), F. Simonotti (UBA,2000), D. Strier (UBA, 2002), A. Chernomoretz (UBA, 2002)
- Member of committee for hiring assistant professors (JTP-de) in UBA (1998)
- Member of committee for hiring assistant professors (JTP-de) in UBA (2002)
- Referee for the la “Agencia Nacional de Promoción Científica“, Argentina (1999-2000-2001)
- Committee member for PhD scholarships, CONICET (1999-2000, 2000-2001)
- **Reviewing Editor of the HFSP Journal (2006-2009) (Journal of the Human Frontiers Science Program)**
- Physics Committee, Conicet 2008-present
- Physics Committee, Conicet, head (2009).

Institutional participation

- Professor member of the committee ruling the Physics Department at UBA (1996-1998, 1998-2000, 2003-2005)
- Committee member of the Graduate School of the School of Sciences, U. Buenos Aires (2001-present), committee member of the graduate program at the Physics Department, School of Sciences, UBA (2001-presente)
- Vice chairman, Physics Department, June 2005-2007

References:

- Michel Vallieres, Chairman, Physics Department, Drexel University, Philadelphia (vallieres@physics.drexel.edu)
- Guillermo Cecchi, IBM T.J. Watson Research Center (gcecchi@us.ibm.com)
- Robert Gilmore, Physics Department, Drexel University, Philadelphia (gilmore@bach.physics.edu)
- Hector Mancini, Chairman, Physics Department, University of Navarra, Pamplona, Spain (hmancini@fisica.unav.es)
- Lorenzo Narducci, Drexel University
- Yves Pomeau, Ecole Normal Superieur, France
- Franz Goller, University of Utah (goller@biology.utah.edu)
- Henry Abarbanel, INLS, UCSD.
- Franz Goller, U. Utah
- Dan Margolia, U. Chicago.

Comments on my work

- **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.**
- **Nature Science Update**, 2 Jan 2004, songbird duets resonate to beat, by P. Ball
- **PhysicsWeb, Canaries sing simple harmonics**, nov 2001, by Katie Pennicott
- **PhysicsWeb, Physicists look at birdsong**, February 2006, by Belle Dumé.

Teaching at the Universidad de Buenos Aires:

(Two terms per years, continuously since 1993)

1. Quantum Mechanics
2. Modern Physics
3. Physics 2 (Chemists)
4. Physics 3 (Physicists)
5. Physics 2(Biologists)
6. *Dinámica no lineal*

Grants in the last years:

1. **UBA X099 (2004-2007) director**
2. **UBA X208 (2001-2003) director**
3. **CONICET PIP 2089, director**
4. **Antorchas (inicio de carrera) (1999-2001)**
5. **FONCyT pict 03-08133 (2002-2005) Researcher.**
6. **NIH. The production of complex sounds in birdsong, period 2005-2010, PI Franz Goller, University of Utah. PI subcontract, Gabriel Mindlin.**
7. **NIH. The production of complex sounds in birdsong, period 2010-2015, PI Franz Goller, University of Utah. Co PI, Gabriel Mindlin.**

Other Info

In 2004 I started an effort for the study of experimental dynamical systems at UBA. At present, my experimental lines of work focus on the study of the physical mechanisms used in the production of song by songbirds. My objective is to unveil which aspects of the song, and syntax are due to nonlinear processes (either from the peripheral system or from the neural structure of the nuclei necessary to generate the syrinx instructions) [52]. I am studying pressure patterns in oscine birds, trying to validate the hypothesis that behind the diversity of birdsong lies a simple nonlinear architecture driven to display subharmonic responses. I am interested in the coupling between the physics of air sacs and neural activity in basal ganglia. Beginning on July, a proposal with Franz Goller from NIH will provide qualitatively different funding to my group.