

CURRICULUM VITAE



NAME: Mirasso Santos, Claudio Rubén

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DATE and PLACE OF BIRTH: March 1st, 1960, Lomas de Zamora, Buenos Aires, Argentina

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MARITAL STATUS: Married with one child

PRESENT POSITION: Catedrático de Universidad (Full Professor)

ACADEMIC ACHIEVEMENTS

1. EDUCATION AND DEGREES

Batchelor in Physics, University Nacional de La Plata, 1978-1984, Buenos Aires, Argentina

Ph.D. in Physics, University Nacional de La Plata, 1985-1989, Buenos Aires, Argentina

Thesis Title: "Contribution to the study of the order-disorder phase transitions in the mean-field approximation".

Advisor: Dr. Victor M. Massida.

Place of work: National Atomic Energy Commission, Buenos Aires, Argentina.

Qualification: Excellent (10)

2. TEACHING ACTIVITY

- **03/82 - 07/83** Student Assistant, Universidad Nacional de la Plata Argentina.
- **07/85 - 12/85** Assistant Professor, Universidad Católica de la Plata Argentina.
- **03/86 - 07/86** Assistant Professor, Universidad Católica de la Plata, Argentina.
- **03/86 - 07/87** Assistant Professor, Universidad de Buenos Aires, Argentina.
- **05/87 - 06/89** Assistant Professor, Universidad de Lomas de Zamora, Buenos Aires, Argentina.
- **08/87 - 10/89** Assistant Professor, Universidad de Buenos Aires, Argentina.
- **11/89 - 09/90** Associate Professor, Universidad Nacional de Mar del Plata, Argentina.
- **10/92 - 09/93** Visiting Professor, Universidad de Cantabria, Santander, Spain.
- **10/93 - 09/94** Visiting Professor, Universitat de les Illes Balears, Palma de Mallorca, Spain
- **02/96 - 09/09** Assistant Professor, Universitat de les Illes Balears, Palma de Mallorca, Spain
- **Since 9/09** Full Professor, Universitat de les Illes Balears, Palma de Mallorca, Spain

PARTICIPATION IN RESEARCH PROJECTS

Coordinator and Principal Investigator

- ***“Optical Chaos Communications Using Laser Diode Transmitters”*** (OCCULT, IST-2000-29683), European Commission IST, FET-Open, 2001-2004.
- ***“Towards a PHOtonic liquid state machine based on delay-CoUpled Systems”*** (PHOCUS, FP7-ICT-2007-240763), European Commission ICT, FET-Open, 1/2010-12/2012.

Principal Investigator

- ***“Láseres de Cavidad Vertical para Aplicaciones Tecnológicas y en Comunicaciones Ópticas”***, Project TIC97/0420 CICYT, Spain, 1997-1998.
- ***“Codificación en Señales Ópticas Caóticas utilizando Diodos Láseres”***, Acción Integrada España/Gran Bretaña, 1997-1998.
- ***“Inestabilidades en la emisión de un Láser de Semiconductor Sujeto a Realimentación Óptica”***, Acción Integrada España/Alemania 1998-2000.
- ***“OCCULT: Optical Chaos communications using laser diode transmitters”***. Project TIC2001-4484-E y TIC2002-10328-E, Ministerio de Ciencia y Tecnología, Spain, 2002-2004.
- ***“Chaos synchronization and on/off phase shift keying encryption”***, Accion Integrada España/Alemania, Project HA2005-0051, 2006-2008.
- ***“Dinámica y sincronización de láseres de semiconductor y aplicaciones”*** (LASEA) MCyT Spain and Feder, project TEC-2005- 07799-02-01/MIC, 2005.
- ***“Photonic integrated components applied to secure chaos encoded optical communications systems”*** (PICASSO IST-2005-34551), European Comission, 2006-2009.
- ***“Photonic Integrated Components Applied To Secure Chaos Encoded Optical Communications Systems”***, Project TEC2006-28105-E, Ministerio de Educación y Ciencia, España, 2006-2009.
- ***“Global Approach to Brain Activity: From Cognition to Disease”*** (FP6-2005-NEST-Path-043309), European Comission, 1/2007-12/2009.
- ***“Improving data DEcoding in optical communication networks All-optically using neuro-inspired photonic systems”*** (TEC2016-80063-C3-3-R), Ministerio de Economía y Competitividad, Spain, 12/2016-07/2020.

- **María de Maeztu Excellence Award**, MDM-2017-0711, Ministerio de Ciencia, Innovación y Universidades (2018-2022).
- “Dendrite-Based Computing Applied to Photonic Systems”, PID2019-111537GB-C22, Ministerio de Ciencia e Innovación (2020-2022).
- “Adaptive Optical Dendrites” (ADOPD, H2020-FETOPEN-899265), Proyecto Europeo del Programa FET-Open, 10/2020-09/2023.
- “Updating the brain’s memory base”, PID2021-128158NB-C22, Ministerio de Ciencia e Innovación (2023-2026)
- **María de Maeztu Excellence Award**, CEX2021-001164-M, Ministerio de Ciencia e Innovación (2023-2026).

Participant

- **“Problemas dinámicos en la formación de estructuras espaciales en sistemas complejos”**, Project PB89-0424 DGICYT, 1990-93. Principal Investigator: Maxi San Miguel.
- **“Ruidos en cadena de transmisión óptica coherente”**, Project TIC90/080 CICYT, 1990-93, Coordinated between the Universidad de las Islas Baleares, Universidad de Cantabria and Instituto de Estructura de la Materia (CSIC). Principal Investigator: Maxi San Miguel.
- **“Modelización, simulación y caracterización de dispositivos para comunicaciones ópticas por fibras”**, Project TIC93/0744 CICYT, 1993-95, Coordinated between the Universidad de las Islas Baleares, Universidad de Cantabria and Instituto de Estructura de la Materia (CSIC). Principal Investigator: Maxi San Miguel.
- **“Gigahertz and Picosecond Phenomena”**, project HCM-CHRX-CT94-0594, 1994-1997 Human Capital and Mobility Program, European Union. Principal Investigator: Phillip Galion.
- **“Perturbación modal de diodos láser”**. Project from CICYT, Spain. Programa Nacional de Tecnologías de la Información y las Telecomunicaciones 1998-1999. Principal Investigator: S. Balle.
- **“Microlasers and QED”** Programme “Training and Mobility of Researchers”, European Commission 1996-2000, Principal Investigator: Maxi San Miguel.
- **“Dinámica no lineal y estocástica en sistemas extendidos”**, Project from DGESIC, Spain, 1998-2001, Principal Investigator: Raúl Toral.
- **“Diodos láser con selección modal”** Project of CICYT, Spain. Programa Nacional de Tecnologías de la Información y las Telecomunicaciones 1999-2002. Principal Investigator: S. Balle.

- ***"VISTA: VCSELS for Information Society Technology Applications"*** Human Potential - Research Training Networks (HP-TMR) European Commission, 2000-2003. Principal Investigator: Maxi San Miguel.
- ***"CONOCE: COoperación y fenómenos NO lineales en sistemas Complejos Extendidos"***, DGES, Spain, 2001-2004, Principal Investigator: Maxi San Miguel.
- ***"SINFIBIO: Sincronización en sistemas físicos y biológicos"***, MCyT, Spain, 2001-2004, Principal Investigator: Raúl Toral.
- ***"CONOCE2: Cooperación y fenómenos no lineales en sistemas complejos extendidos"*** (FIS2004-00953) (2004-2008). Project of the Ministerio de Educación y Ciencia Spain, Principal Investigator: M. San Miguel.
- ***"FISICOS: Física Interdisciplinar de Sistemas Complejos"***, (FIS2007-80327) (2007-2012). Project of the Ministerio de Educación y Ciencia, Spain, Principal Investigator: M. San Miguel.
- ***"DeCoDicA: Delay-Coupled Diode Lasers for Photonic Applications"***, (TEC2009-14101). Project of the Ministerio de Ciencia e Innovación, Spain, Principal Investigator: I. Fischer.
- ***"Intense@cosyp: Complex Systems Physics: Information, Technology, Society and Ecology"***, (FIS2012-30634), 1/2013-12/2015, Project of the Ministerio de Economía y Competitividad, Principal Investigator: M. San Miguel.
- ***"TRIPHOP: Towards brain-inspired efficient photonic information processing"***, 1/2013-12/2015, Project of the Ministerio de Economía y Competitividad, Principal Investigator: I. Fischer

RESEARCH PROJECTS WITH COMPANIES

- Research Cooperation Agreement, **XARION Laser Acoustics GmbH**, Principal Investigator: I. Fischer and Claudio Mirasso 7/2014-2/2015.
- ECG classification using reservoir computing, **SMART SOLUTIONS TECHNOLOGIES, S.L (Nuubo)**, Principal Investigator: Claudio Mirasso and Miguel Cornelles, 6/2015-7/2016.
- Responsible for a Collaboration Agreement with the IB Salut for the study of the saturation of the emergency services of the hospitals of the Balearic Islands.
- NDA and Research Collaboration Agreement, **Huawei Technologies Dusseldorf GmbH**, Principal Investigator: I. Fischer and Claudio Mirasso 2021-2022.

LIST OF RESEARCH PUBLICATIONS

Web of Science

Publications 227 Total From 1900 to 2023	Citing Articles 5,698 Analyze Total 5,520 Analyze Without self-citations	Times Cited 10,040 Total 9,359 Without self-citations	44.23 Average per item	44 H-Index
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15 MOST RELEVANT PUBLICATIONS WITH CITATIONS.

- “Chaos-based communications at high bit rates using commercial fiber-optic links” A. Argyris, D. Syvridis, L. Larger, V. Annovazzi-Lodi, P. Colet, I. Fischer, J. Garcia-Ojalvo, C. R. Mirasso, L. Pesquera and K.A. Shore, Nature **438**, 343, 2005, **(1274 citations)**.
- “Complex photonics: Dynamics and applications of delay-coupled semiconductor lasers”, M. C. Soriano, J. García-Ojalvo, C. Mirasso and I. Fischer, Rev. Mod. Phys. **85**, 421 (2013) **(416 citations)**.
- “Synchronization of Chaotic Semiconductor Lasers: Application to Encoded Communications”, C. R. Mirasso, P. Colet and P. García-Fernández, Phot. Tech. Lett. **8**, 299 (1996) **(330 citations)**.
- “Chaos Synchronization and Spontaneous Symmetry Breaking in Symmetrically Delayed Coupled Semiconductor Lasers”, T. Heil, I. Fischer, W. Elsasser, J. Mulet and C. R. Mirasso, Phys. Rev. Lett. **86**, 795 (2001) **(369 citations)**.
- “Zero-lag Long-Range Synchronization via Dynamical Relaying”, I. Fischer, R. Vicente, J. M. Buldú, M. Peil, Claudio R. Mirasso, M. C. Torrent and J. García-Ojalvo, Phys. Rev. Lett. **97**, 123902 (2006) **(238 citations)**.
- “Dynamical relaying can yield zero time lag neuronal synchrony despite long conduction delays”, R. Vicente, L. L. Gollo, C. R. Mirasso, I. Fischer and G. Pipa, Proceedings of the National Academy of Sciences USA **105**, 17157 (2008) **(244 citations)**.
- “Information processing using a single dynamical node as complex system” L. Appeltant, M.C. Soriano, G. Van der Sande, J. Danckaert, S. Massar, J. Dambre, B. Schrauwen, C.R. Mirasso and I. Fischer, Nature Communications, **2**, 468 (2011) **(779 citations)**.
- “Diversity Induced Resonance”, C. Tessone, C. R. Mirasso, R. Toral and J. Gunton, Phys. Rev. Lett. **97**, 194101 (2006) **(213 citations)**.
- “Parallel photonic information processing at gigabyte per second data rates using transient states”, D. Brunner, M.C. Soriano, C.R. Mirasso and I. Fischer, Nature Communications **4**, 1364 (2013) **(516 citations)**.
- “Sex-related similarities and differences in the neural correlates of beauty”, C. J. Cela-Conde, F. J. Ayala, E. Munar, F. Maestú, M. Nadal, M. A. Capó, D. del Río, J. J. López-Ibor, T. Ortiz, C. R. Mirasso, and G. Marty, Proceedings of the National Academy of Sciences USA, **106**, 3847 (2009) **(124 citations)**.

- “Effects of auditory noise on the psychophysical detection of visual signals: Cross-modal stochastic resonance”, L. Martínez, Claudio R. Mirasso, A. Flores and E. Manjarrez, *Neurosc. Lett.*, 415, 231 (2007) **(88 citations)**.
- “Mechanisms of Zero-Lag Synchronization in Cortical Motifs”, L. L. Gollo, C. R. Mirasso, O. Sporns and M. Breakspear, *PLoS Comput Biol* **10**(4): e1003548 (2014) **(89 citations)**.
- “Modelling positive Granger Causality and negative phase lag between cortical areas”, F. S. Matias, L. L. Gollo, P. V. Carelli, S. L. Bressler, M. Copelli, and C. R. Mirasso, *NeuroImage* **99**, 411 (2014) **(43 citations)**.
- “A Unified Framework for Reservoir Computing and Extreme Learning Machines based on a Single Time-delayed Neuron”, S. Ortin, M. Soriano, L. Pesquera, D. Brunner, D. San Martin, I. Fischer. C. Mirasso and J. M. Gutierrez, *Scientific Reports* 5, 14945 (2015) **(100 citations)**.
- “Different theta frameworks coexist in the rat hippocampus and are coordinated during memory-guided and novelty tasks”, V. J. López-Madrona, E. Pérez-Montoyo, E. Álvarez-Salvado, D. Moratal, O. Herreras, E. Pereda, C. R. Mirasso, S. Canals, *eLife* **9**, e57313, (2020) **(30 citations)**.

FULL LIST OF PUBLICATIONS

1. “Phase diagram of the “2+4” model in the mean-field approximation without correlation”, Claudio R. Mirasso and Vittorio Massidda. *Physical Review B*, **40**, 7336 (1989).
2. “Axial Next-Nearest-Neighbor Ising model, dipole-dipole interactions and the phase transitions of NaNO_2 ” Vittorio Massidda and Claudio R. Mirasso, *Physical Review B*, **40**, 9327 (1989).
3. “Orientational transitions in a one-dimensional lattice of molecules with dipole and quadrupole moments”, Claudio R. Mirasso and Vittorio Massidda, *Physica A*, **172**, 320 (1991).
4. “Segregation in a thin film of binary alloys A_xB_{1-x} ”, Ana Maria Llois and Claudio R. Mirasso, *Physical Review B*, **41**, 8112 (1990).
5. “The lattice covering time problem for k -times visited sites”, Claudio R. Mirasso and Hector O. Martin, *Z. Phys. B*, **82**, 433 (1991).
6. “Commensurate Configurations in the Ground State of a ϕ^4 model with next-nearest-neighbours interactions”, Claudio R. Mirasso and Raúl Toral, *J. of Physics: Condensed Matter*, **3**, 8999 (1991).
7. “Pulse Statistics in single mode semiconductor lasers modulated at GHz rates”, Claudio R. Mirasso, Pere Colet and Maxi San Miguel, *Optics Letters*, **16**, 1753 (1991).
8. “Least energy configuration in orthorhombic lattices of dipoles”, Vittorio Massida y Claudio R. Mirasso, *J. of Magnetism and Magnetic Materials*, **116**, 277 (1992).

9. "Pattern effects in Time jitter of semiconductor laser", A. Sapia, A. D'Ottavi, P. Spano, P. Colet, C. Mirasso and M. San Miguel, Appl. Phys. Lett. **61**, 1748 (1992).
10. "Analytical calculation of time jitter in single-mode semiconductor lasers under fast periodic modulation", Angel Valle, Miguel Rodriguez and Claudio R. Mirasso, Optics. Lett. **17**, 1523 (1992).
11. "Dependence of time jitter on bias level for single-mode semiconductor lasers under high Speed operation", Claudio R. Mirasso, Pere Colet and Maxi San Miguel, IEEE J. Quantum Electron. **29**, 23 (1993).
12. "Pseudorandom Word Modulation of Single-Mode Semiconductor Lasers at Gigahertz Rates", Claudio R. Mirasso, Pere Colet and Maxi San Miguel, IEE Proc. Optoelectron., **40**, 26 (1993).
13. "Memory diagram of single-mode semiconductor lasers", Pere Colet, Claudio R. Mirasso and Maxi San Miguel, IEEE J. of Quantum Electron. **29**, 1624 (1993).
14. "Analytical Results of the Switch-on Time Statistics in DFB Lasers Diodes Driven by Short Triangular Pulses", Salvador Balle, Claudio R. Mirasso, Adalberto Sapia and Paolo Spano, Appl. Phys. Lett. **63**, 1721, (1993).
15. "Pulse-To-Pulse Frequency Jitter in Diode Lasers and Soliton Transmission", Claudio R. Mirasso, Luis Pesquera and Antonio Mecozzi, IEEE Phot. Tech. Lett. **5**, 1455, (1993).
16. "Effects of Current Modulation on Timing Jitter of Single Mode Semiconductor Lasers in Short External Cavities", Claudio R. Mirasso and Emilio Hernández-García, IEEE J. Quantum Electron., **30**, 2281, (1994).
17. "Turn-on Jitter of External Cavity Semiconductor Lasers", Emilio Hernández-García, Claudio R. Mirasso, Alan Shore and Maxi San Miguel, IEEE J. of Quantum Electron. **30**, 241 (1994).
18. "Simple Method for Estimating the Memory Diagram in Single Mode Semiconductor Laser", Claudio R. Mirasso, Angel Valle, Luis Pesquera and Pere Colet, IEE Proc. Optoelectron., **141**, 109, (1994).
19. "Current Modulation and Transient Dynamics of Single-Mode Semiconductor Lasers Under Different Feedback Conditions", Claudio R. Mirasso, Emilio Hernández-García, Jaume Dellunde, M. C. Torrent and J. M. Sancho, IEE Proc. Optoelectron., **142**, 17, (1995).
20. "Analytical Calculations of Switch-on Time and Timing Jitter in Diode Lasers Subjected to Optical Feedback and External Light Injection", M. C. Torrent, Jaume Dellunde, Claudio R. Mirasso, Emilio Hernández-García and J. M. Sancho, Optics Communications **115**, 523, (1995).
21. "Transmission of Solitons Generated under Periodic and Pseudorandom Word Modulation of Laser Diodes", Claudio R. Mirasso and Luis Pesquera, IEEE Phot. Tech. Lett. **7**, 437, (1995).

22. "Transient Dynamics of a Single-Mode Semiconductor Laser Subjected to Both Optical Feedback and External Light Injection", J. Dellunde, Claudio R. Mirasso, M. C. Torrent, J. M. Sancho and E. Hernández-García, *Optical and Quantum Electron.* **27**, 755, (1995).
23. "Analytical and Numerical Evaluation of Transmission Characteristics of Chirped DFB Lasers in Dispersive Optical Fibers", J. Martínez-Linares, Claudio R. Mirasso, P. García-Fernández and J. Bermejo, *Optics Communications* **116**, 116, (1995).
24. "Mode Partition Noise of Nearly Single Mode Semiconductor Lasers Modulated at Gigahertz Rates", A. Valle, Claudio R. Mirasso and Luis Pesquera, *IEEE J. Quantum Electron.* **31**, 876 (1995).
25. "Pulse Width Reduction in Single-Mode Semiconductor Lasers via External Injection of Optical Pulses", Claudio R. Mirasso, *Applied Phys. Lett.* **66**, 1880, (1995).
26. "Turn-on Time Statistics of Modulated Lasers Subjected to Resonant Weak Optical Feedback", J. Dellunde, M. C. Torrent, Claudio R. Mirasso and J. M. Sancho, *Physical Review A* **52**, 4187, (1995).
27. "Effect of Phase-Conjugate Optical Feedback on Turn-On Jitter in Laser Diodes", J. Revuelta, L. Pesquera, E. Hernández-García and Claudio R. Mirasso, *Optics Lett.* **20**, 2213, (1995).
28. "Analytical Study of Non-Linear Chirped Pulses: Propagation in Dispersive Optical Fibers", César Lozano, P. García-Fernández and Claudio R. Mirasso, *Optics Communications*, **123**, 752, (1996).
29. "Synchronization of Chaotic Semiconductor Lasers: Application to Encoded Communications", Claudio R. Mirasso, Pere Colet and Priscila García-Fernández, *Phot. Tech. Lett.* **8**, 299, (1996).
30. "Modulation Response of Quantum-Well Lasers with Carrier Transport Effects Under Weak Optical Feedback", M. Homar, Claudio R. Mirasso, I. Esquivias and M. San Miguel, *Phot. Tech. Lett.* **8**, 861, (1996).
31. "Visualization of the Sisyphus Attractor", Claudio R. Mirasso, Martijn Mulder, Hans J. W. Spoelder and Daan Lenstra, *Computer in Physics* **11**, 282, (1997).
32. "Effect of Optical Feedback on Fast Modulated Semiconductor Lasers", M.V. Homar and Claudio R. Mirasso, *IEE Proceedings Optoelectronics* **144**, 30 (1997).
33. "Prevention of Coherence Collapse in Diode Lasers by Dynamic Targeting", J. Wieland, Claudio R. Mirasso and D. Lenstra, *Opt. Lett.* **22**, 469 (1997).
34. "Low-Cost Feedback Insensitive DFB Laser / EAM package", Claudio R. Mirasso, J. M. Sancho, J. Dellunde and M. C. Torrent, *Phot. Tech. Lett.* **9**, 1000 (1997).
35. "Fiber Based Dispersion Compensation Schemes in Nonlinear Fibers for Laser Diodes Pulses in High Bit-Rate IM/DD Systems", A. Sánchez-Díaz, P. García-Fernández, J. Soto-Crespo and Claudio R. Mirasso, *Opt. Comm.* **143**, 294 (1997).

36. "High Bit Rate Generation of Low Chirped Pulses from Vertical cavity Surface Emitting Lasers via Axial External Magnetic Field", H. Van der Lemm, J. Martín-Regalado, S. Balle and Claudio R. Mirasso, *Phot. Tech. Lett.* **10**, 21 (1998).
37. "Semiconductor optoelectronics", C. R. Mirasso, *IEE Proc. Optoelectron.* 145, 1 (1998).
38. "Effect of Strong Optical Feedback on Vertical Cavity Surface Emitting Lasers", P. Spencer, Claudio R. Mirasso and A. Shore, *Phot. Tech. Lett.* **10**, 191 (1998).
39. "Modeling of Optical Synchronization of Chaotic External-Cavity VCSELs", P. Spencer, Claudio R. Mirasso, P. Colet and A. Shore, *IEEE J. Quantum Electron.* **34**, 1673 (1998).
40. "Generator of Ultrashort Optical Pulses for Time Division Multiplexing", J. Dellunde, Claudio R. Mirasso, C. Torrent and J. M. Sancho, *IEEE Trans. Optoelectron. Devices.* **45**, 2122 (1998).
41. "Encoded Gbit/s Digital Communications with Synchronized Chaotic Semiconductor Lasers", A. Sánchez-Díaz, Claudio R. Mirasso, P. Colet and P. García-Fernández, *IEEE J. Quantum Electron.*, **35**, 292 (1999).
42. "Numerical Statistics of Power Drop-Outs based on the Lang-Kobayashi Model", J. Mulet and Claudio R. Mirasso, *Phys. Rev. E*, **59**, 5400 (1999).
43. "Analysis of Optical Chaos Synchronization in Frequency Detuned External Cavity VCSELs", P. Spencer and Claudio R. Mirasso, *IEEE J. Quantum Electron.* **35**, 803, (1999).
44. "Self-Pulsating Frequency of CD Lasers: Theory and Experiment.", Claudio R. Mirasso, G. Van Tartwijk, E. Hernández-García, D. Lenstra, S. Lynch, P. Landais, P. Phelan, J. O'Gorman, M. San Miguel and W. Elsasser, *IEEE J. Quantum Electron.*, **35**, 764 (1999).
45. "Lyapunov Potential Description of Laser Dynamics", C. Mayol, R. Toral and Claudio R. Mirasso, *Phys. Rev. A*. **59**, 4690 (1999).
46. "Statistical Properties of low Frequency Fluctuations under Single Mode Operation in DFB lasers: Experiments and Modelling", T. Heil, J. Mulet, I. Fischer, W. Elsasser, Claudio R. Mirasso, *Optics Letters* **24**, 1275 (1999).
47. "Coherence and Synchronization in Diode-Laser Arrays with Delayed Global Coupling", J. García-Ojalvo, J. Casademont, Claudio R. Mirasso, M.C. Torrent and J.M. Sancho, *Intern. J. of Bifurcat. and Chaos*, **9**, 2225 (1999).
48. "Chaos Synchronization and Spontaneous Symmetry Breaking in Symmetrically Delayed Coupled Semiconductor Lasers", T. Heil, I. Fischer, W. Elsasser, J. Mulet and Claudio R. Mirasso, *Phys. Rev. Lett.* **86**, 795 (2001).
49. "Main Resonances in Directly Modulated Semiconductor Lasers: Effect of Spontaneous Emission and Gain Saturation", C. Mayol, S. Turovets, R. Toral, Claudio R. Mirasso and L. Pesquera, *IEE Proc. Optoelect.* **148**, 41 (2001).

50. "Polarization Resolved Intensity Noise in Vertical-Cavity Surface-Emitting Lasers", J. Mulet, Claudio R. Mirasso and M. San Miguel, Phys. Rev. A **64**, 023817 (2001).
51. "Coherence Resonance in Chaotic Systems", C. Palenzuela, R. Toral, Claudio R. Mirasso, O. Calvo and J. Gunton, Europhys. Lett. **56**, 347 (2001).
52. "Analytical and Numerical Studies of Noise-induced Synchronization of Chaotic Systems", R. Toral, Claudio R. Mirasso, E. Hernández-García and O. Piro, Chaos **11**, 665 (2001).
53. "Effect of External Noise Correlation in Optical Coherence Resonance", J. Buldú, J. García-Ojalvo, Claudio R. Mirasso, M. C. Torrent and J. M. Sancho, Phys. Rev. E **64**, 051109 (2001).
54. "Coherence Resonance in Chaotic Electronic Circuits", O. Calvo, Claudio R. Mirasso and R. Toral, Electronics Lett. **37**, 1062, (2001).
55. "Synchronization and multi-mode dynamics of mutually coupled semiconductor lasers", Claudio R. Mirasso, M. Kolesik, M. Matus, J.K. White and J. Moloney, Phys. Rev. A **65**, 013805, (2002).
56. "Dynamics of Modal Power Distribution in a Multimode Semiconductor Laser with Optical Feedback", J. M. Buldu, J. Trull, M. C. Torrent, J. García-Ojalvo and Claudio R. Mirasso, J. Opt. B: Quantum and Semiclass. Opt. **4**, L1 (2002).
57. "Criteria for Chaos Synchronization of Coupled Chaotic External-Cavity Semiconductor Lasers", J. Revuelta, Claudio R. Mirasso, P. Colet and L. Pesquera, Phot. Tech. Lett. **14**, 140 (2002).
58. "Theory of Main Resonances in Directly Modulated Diode Lasers", C. Mayol, R. Toral, Claudio R. Mirasso, S. Turovets and L. Pesquera, IEEE Journal of Quantum Electronics **38**, 260 (2002).
59. "Anticipating the dynamics of chaotic maps", E. Hernandez-Garcia, C. Masoller and Claudio R. Mirasso, Phys. Lett. A **295**, 39 (2002).
60. "Intensity and Polarization Self-Pulsations in VCSELs", A. Sciré, J. Mulet, Claudio R. Mirasso and M. San Miguel, Opt. Lett. **27**, 391 (2002).
61. "Chaos Shift Keying Encryption in Chaotic External-Cavity Semiconductor Lasers Using a Single-Receiver Scheme", Claudio R. Mirasso, J. Mulet and C. Masoller, Phot. Tech. Lett. **14**, 456 (2002).
62. "Synchronization regimes of optical-feedback-induced chaos in unidirectionally coupled semiconductor lasers", A. Locquet, C. Masoller and Claudio R. Mirasso, Phys. Rev. E **65**, 056205 (2002).
63. "Modelling Bidirectionally Coupled Single-Mode Semiconductor Lasers", J. Mulet, C. Masoller and Claudio R. Mirasso, Phys. Rev. A, **65**, 063815 (2002).

64. "Class A lasers with injected signal: Bifurcation set and Lyapunov-potential functions", C. Mayol, R. Toral, Claudio R. Mirasso and M. Natielo, Phys. Rev. A **66**, 013808 (2002).
65. "Stochastic Entrainment of Optical Power Dropouts", J.M. Buldú, J. García-Ojalvo, Claudio R. Mirasso and M.C. Torrent, Phys. Rev. E, **66**, 021106 (2002)
66. "Introduction to the Feature Section on Optical Chaos and Application to Cryptography", S. Donati and C. Mirasso, IEEE J. Quantum Electron. **38**, 1138 (2002).
67. "ON/OFF Phase Shift Keying for Chaos-Encrypted Communication using External-Cavity Semiconductor Lasers", T. Heil, J. Mulet, I. Fischer, Claudio R. Mirasso, M. Peil, P. Colet, and W. Elsasser, IEEE J. Quantum Electron. **38**, 1162 (2002).
68. "Open vs Closed Loop Performance of Synchronized Chaotic External-Cavity Semiconductor Lasers", R. Vicente, T. Pérez and Claudio R. Mirasso, IEEE J. Quantum Electron. **38**, 1197 (2002).
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INVITED TALKS

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4. *"Efecto Sisyphus en un Láser de Semiconductor", Departamento de Física, University Nacional del Centro de la Provincia de Buenos Aires, August de 1996.*
5. *"Láseres de Compact Disk: Teoría y Experimento", Departamento de Física, University Nacional del Centro de la Provincia de Buenos Aires, September de 1997.*
6. *"Láseres autopulsantes: teoría and experimento", Departamento de Física, grupo de Electrónica Cuántica, University de Buenos Aires, Argentina, September 1997.*
7. *"Synchronization of Chaotic diode lasers: Application to Data Encryption", Photonic West, Physics and Simulation of Optoelectronic Devices VII, San José, USA, January 23-29, 1999.*
8. *"Low Frequency Fluctuations in a DFB Laser Subject to Optical Feedback: Experiment and Theory", WIAS Workshop, Dynamics of Semiconductor Lasers, Berlin, Germany, September 9-11, 1999.*
9. *"Application of Semiconductor Lasers to Secure Communications", Claudio R. Mirasso, Fundamental Issues of Nonlinear Dynamics, International Spring School, Texel, The Netherlands, April 16-19, 2000.*
10. *"Chaos Synchronization of Mutually Coupled Semiconductor Lasers: Theoretical Analysis", WIAS Workshop, Dynamics of Semiconductor Lasers, Berlin, Germany, September 13-15, 2001*
11. *"Dynamics of Mutually Coupled Semiconductor Lasers: Theoretical Results", From Gamma-Ray Optics to Semiconductor Laser Dynamics Conference, Brussels, Belgium, April 6-7 2001.*
12. *"Privacy in communications: can chaos do anything for us?, MEDYFINOL, Nonequilibrium Statistical Mechanics and Nonlinear Physics, Colonia '02, Uruguay, December 9-13, 2002.*
13. *"Communicating with Chaotic Light", Hot Topics in Photonics, SPIE International Symposium Photonics Fabrication Europe, Bruges, Belgium, October 28-Noviembre 1, 2002.*
14. *"Optoelectronic devices for optical chaos communication" SPIE Semiconductor Optoelectronic Devices for Lightwave Communication Conference, Florida, USA, September 7-11 (2003).*
15. *"Chaos control and synchronization in diode lasers", Frontiers in Optics, Optical Society of America Annual Meeting, Tucson, Arizona, USA, October 5-9, (2003).*
16. *"Anticipated Synchronization Forecasts the Response of a Neuron in a Noisy Environment", The Sloan-Swartz Center, The Salk Institute for Biological Studies, March 18 (2004).*
17. *"Dynamics and Synchronization of Bidirectionally Coupled Semiconductor Lasers", WIAS Workshop, Dynamics of Semiconductor Lasers, Berlin, Germany, May, 2005.*
18. *"Synchronization properties of bidirectionally coupled semiconductor lasers", International Conference on Control and Synchronization of Dynamical Systems, León, Mexico, October 4-*

7, 2005.

19. *"Chaotic Optical Communications", Frontiers in Optics, Optical Society of America Annual Meeting, Tucson, USA, October 16-20, 2005.*
20. *"Chaotic Optical Communications", Second 'Rio de la Plata' Workshop on Noise, Chaos, and Complexity in Lasers and Nonlinear Optics, Colonia del Sacramento, Uruguay, December 2005.*
21. *"Chaos Encryption in real life: Field demonstration of telecommunication with a chaotic carrier", Nonlinear Dynamics of Spatiotemporal Self-Organization, Barcelona, February 2006.*
22. *"Chaos Encryption in real life: Field demonstration of telecommunication with a chaotic carrier", FISES 2006, Física Estadística and No Lineal, Granada, Spain, September 2006.*
23. *"Collective behavior yields zero-lag synchronization between distant elements: from lasers to neurons", MEDYFINOL 2006, Mecánica Estadística del Desequilibrio y Física No Lineal, Mar del Plata, Argentina, December 2006.*
24. *"Zero-Lag Chaos Synchronization in a Chain of Mutually Delay-Coupled Lasers": II. "Synchronization Robustness and its Application to Bidirectional Communications", Workshop on Statistical Physics and its Applications to Complex Problems in Communications, Eilat, Israel, March 2007.*
25. *"Synchronization and Correlation Properties of N Delay-Coupled Semiconductor Lasers in a Ring Configuration", 3rd International IEEE Scientific Conference on Physics and Control (PhysCon2007), Potsdam, Germany, September 2007.*
26. *"Dynamics and Synchronization of N Delay-Coupled Semiconductor Lasers in a Ring Configuration" WIAS Workshop Nonlinear Dynamics in Semiconductor Lasers, Berlin, 19-21 November, 2007.*
27. *"Dynamical Relying Yields Zero-Lag Synchronization Between Interacting Neurons", Coherent Behavior in Neuronal Networks Workshop, Palma de Mallorca, Spain, October 2007.*
28. *"Chaos based communications: from concepts to reality", Solvay Workshop "Bits, Quanta, and Complex Systems: modern approaches to photonic information processing", Brussels, Belgium, May 2008.*
29. *"Chaos-based optical communications in Europe", Workshop NTT Corporation, Nara, Japan, September 2008.*
30. *"Dynamics and synchronization of delay-coupled oscillators: From Lasers to Neurons" Dynamics Days Asia Pacific 5, Nara Japan, September 2008.*
31. *"Delayed but still in time: a neuronal mechanism for zero-lag long-range synchronization in the brain", MEDYFINOL 2008, Mecánica Estadística del Desequilibrio and Física No Lineal, Punta del Este, Uruguay, December 2008.*

32. *"Synchronization without Correlation", 2nd scientific workshop of the NEST project GABA (Global Approach to Brain Activity) Paris, France, March 2009.*
33. *"Dynamics of mutually delay-coupled systems: From Lasers to Neurons", International Workshop "Chaos and Applications in Telecommunication and Sensing", Crete, Greece, June 2009.*
34. *"Synchronization in delayed-coupled systems" Low Cost High Physics and Appropriate Solutions to Real World Problems in Developing Countries, Yaounde, Cameroon, December 2011.*
35. *"Synchronization in Motifs and Complex Networks of Delay-coupled Neurons", Brain Connectivity Workshop, Chengdu, China, June 2012,*
36. *"Information processing with transients states generated by delay-coupled dynamical systems", Dynamics Days South America 2012, Cartagena, Colombia, Noviembre 2012 (Plenary).*
37. *"Mimicking the brain: information processing with delay-coupled systems" MEDYFINOL 2012 XVII edition, Santiago de Chile, Chile, December 2012.*
38. *"Anticipated Synchronization in Neuronal Circuits", Dynamics Days Europe 2013, Madrid, June 2013.*
39. *"Inhibitory Synapses Control Anticipation in Neuronal Circuits", 10th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Madrid, Junio 2014.*
40. *"Reconciling information directionality with negative time lag in neuronal circuits", Recent Advances in Bioinformatics and Neuroscience, Madrid, Spain, June 2015.*
41. *"Information processing with delay-based neuro-inspired systems", 3rd Baltic-Nordic Summer School on Neuroinformatics, Tartu, Estonia, June 2015.*
42. *"Reconciling causal influence and negative time lag in neuronal circuits", International Conference on System Level Approaches to Neural Engineering, Barcelona, Spain, September 2015.*
43. *"Zero-lag and anticipated synchronization in neuronal circuits", School on Complex Networks and Applications to Neuroscience, Sao Paulo, Brazil, September/October 2015.*
44. *"Information processing with neuro-inspired delay-based nonlinear systems", School on Complex Networks and Applications to Neuroscience, Sao Paulo, Brazil, September/October 2015.*
45. *"A novel machine learning approach to analyze long-lasting ECG time series", International Congress of Electrocardiology, Palma de Mallorca, Spain, June 2016.*
46. *"Anticipated Synchronization in Neuronal Circuits", Encontro de Física 2016, Natal, Brazil,*

September 2016.

47. "Modeling Complex Phenomena in Neuronal Circuits", Crossroads in Complex Systems, Palma, Mallorca, June 2017.
48. "Information Processing with neuro-inspired systems", Memory workshop, Alicante, Spain, October 2017.
49. "High frequency neurons contribute to define effective connectivity in brain networks", Barcelona Computational, Cognitive and Systems Neuroscience (BARCCSYN) 2018, Barcelona, Spain.
50. "High frequency neurons route information flow in brain networks", XX Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics (MEDYFINOL 2018), Santiago de Chile, Chile.
51. "Synchronization of neuronal circuits: modeling and dynamics", 1st Summer School of "Interdisciplinary Research on Brain Network Dynamics", Terzolas, June 24-28 2019.
52. "Information Processing with neuro-inspired delay-based nonlinear systems", 1st Summer School of "Interdisciplinary Research on Brain Network Dynamics", Terzolas, June 24-28 2019.
53. "The role of high-frequency neurons in shaping effective connectivity of brain network", Latin American Conference 2.0 on Complex Networks, Cartagena, Colombia, August 5-9 2019.
54. "Comparison of photonic reservoir computing systems for the recovery of optical communication signals" 2019 International Symposium on Nonlinear Theory and Its Applications (NOLTA2019), Kuala Lumpur, Malaysia, December 2-6 2019.
55. "High frequency neurons influence Signal Transmission in brain Circuits", 2019 International Symposium on Nonlinear Theory and Its Applications (NOLTA2019), Kuala Lumpur, Malaysia, December 2-6 2019.
56. "An inhibitory gating mechanism operated by synaptic plasticity regulates information transmission between the dentate gyrus and CA3" Computational Neuroscience Meeting (CNS*2021), Workshop: Dissecting the role of interneurons in mnemonic functions using computational modelling approaches, Online Meeting 3-7 July 2021.
57. "Regulation of inhibitory circuits in the dentate gyrus: role on temporal coding and pattern separation", Spanish Society for Neuroscience Meeting, Workshop: Binding cell assemblies into memory engrams, Lleida, Spain, 3-5 November 2021.
58. "On the role of inhibitory neurons in the information processing capacity of the dentate gyrus of the hippocampus", South American Institute for Fundamental Research, "First speaker for the first semester seminars", ICTP-SAIFR Complex Systems & Statistical Mechanics Seminars, Sao Paulo, Brazil (online presentation) May 2022.
59. "Effects of competition between excitation and inhibition on pyramidal neurons in the primary visual cortex of mice" XXI Conference on Nonequilibrium Statistical Mechanics and Nonlinear Physics (MEDYFINOL 2022), Colonia del Sacramento, Uruguay, 8-10 December 2022.

PATENTS

Authors: José M. Sancho, Jaime Dellunde, María del Carmen Torrent, Claudio R. Mirasso

Title: Dispositivo para producir pulsos de luz láser sin efectos de reflexión
Country: SPAIN **Year:** 1997

Authors: Raúl Toral, Claudio R. Mirasso, Marzena Ciszak, Oscar Calvo
Título: Procedimiento y aparato para el control de un sistema dinámico maestro
Country: SPAIN **Year:** 2008

Authors: X. Ibáñez, S. Ortín, M. C. Soriano, C. R. Mirasso
Título: **System and methods for classifying arrhythmia-related heartbeats**
<https://patents.google.com/patent/US10383539B2/>
ES Patent 2017, Serial No. ES 201730826
U.S. Patent 2017, Serial No. US15/638,263
Country: SPAIN, USA **Year:** 2017
Worldwide applications 2017 US 2018 EP AU JP WO
Application number: PCT/EP2018/066611
Filing date: 2018-06-21
Legal status: active 2037-11-30

DISSEMINATION AND SCIENTIFIC CULTURE

Responsible for the area of dissemination and scientific culture of the Institute of Cross-Disciplinary Physics and Complex Systems 2007-2016

a. Publications

- *"Chaotic Optical Communications"*, Claudio R. Mirasso, Hot Topics, LEOS Newsletters, February 2005, p. 12.
- *"Cuando las neuronas sincronizan sus relojes"* R. Vicente y C. R. Mirasso, MENTE & CEREBRO, número 54, 61, 2012.
- *"50 años del efecto mariposa"* C. R. Mirasso y E. Hernández-García. [ENKI, p. 55, Marzo 2013.](#)
- *"Los beneficios prácticos de la luz láser compleja"* C. R. Mirasso e I. Fischer, <http://esmateria.com/2013/04/12/los-beneficios-practicos-de-la-luz-laser-caotica/>, 12/4/2013.
- *"Nuestro cerebro es capaz de anticiparse a lo que va a pasar"* Claudio R. Mirasso, Saberes y Ciencias, número 34, p. 10, diciembre 2014.

[\(http://www.youblisher.com/p/1034279-Saberes-y-Ciencias-Diciembre-2014-numero-34-ano-3/\)](http://www.youblisher.com/p/1034279-Saberes-y-Ciencias-Diciembre-2014-numero-34-ano-3/) .

- *"Oportunidades de la crisis: hagamos una universidad mejor"*. Claudio R. Mirasso, Columna en El País. April 29, 2015

(http://elpais.com/elpais/2016/04/27/ciencia/1461773161_682306.html)

- *"La emulaci3pn del Cerebro"*. Claudio R. Mirasso, Fernando Maestú, Ernesto Pereda, Raúl Vicente, National Geographic, RBA Editores, 2018 (Also edited in France and Italy).

b. Conferences

- *"Los láseres: cómo funcionan y para qué sirven"*, Secondary Schools of Baleares, semana de la ciencia, años 2007-2011.
- *"El láser: 50 años de una invención que cambió nuestras vidas"*, opening conference of the Week of Science and Technology, Palma de Mallorca, 2010.
- *"El láser: 50 años de una invención que cambió nuestras vidas"*, Museo de Menorca, Mahon, 2010.
- *"El láser: 50 años de una invención que cambió nuestras vidas"*, Programa Univesidad Abierta para Mayores, Universidad de las Islas Baleares, 2009-2012.

c. Organization of Events

- *"Explorant les Fornteres entre els Sabers"*, 10 ediciones, 2008-2017.
- *Responsible of the IFSC stand at the "Balearic Science Fair"*, 2009-2011.
- *Responsible for the IFISC of the program for the "Week of Science of the Balearic Islands"*, 2009-2015.
- *Organizer of the "Opening science" course, coordinated by CaixaForum Barcelona, Palma February-May 2013.*
- *Responsible scientific exhibition "Ilumínate", Casal Solleric, Palma de Mallorca, 26/11/2015 - 3/1/2016.*

d. Outreach and scientific culture projects

- *EXPLORANT: Explorant les Fronteres entre els Sabers II.* [AAEE0070/08] Acciones Especiales, Govern Balear. Investigador: Claudio Mirasso (2009), Presupuesto: 2.500 €
- *Ciudad Europea de la Ciencia y la Innovación 2010.* [FCT-09-1622] FECYT. Investigador: Claudio Mirasso (2009-2010), Presupuesto: 20.000 €.
- *Explorant4: Explorant les Fronteres entre els Sabers IV.* [AAEE187/09]. Acciones Especiales. Govern Balear. Investigador: Claudio Mirasso (2011), Presupuesto: 6.000 €.
- *Divulga@IFISC,* [AAEE008/2012] Direcció General d'Universitats, Recerca i Transfèrència del Coneixement, Govern Balear, Investigador: Claudio Mirasso. (2013), Presupuesto: 8157,5 €.
- *Abriendo la Ciencia,* Fundación La Caixa, Investigador: Claudio Mirasso. (2013),

Presupuesto: 9000 €.

- *DERR@IFISC (Difusió i Explotació dels Resultats de Recerca)* Investigador: Claudio Mirasso. (2015), Presupuesto: 18950 €.
- *“Cicle de conferencies: “explorant les fronteres entre els sabers IX: de la intel·ligència humana a la intel·ligència artificial”* Fundación La Caixa, Investigador: Claudio Mirasso. (2016), Presupuesto: 5937,5 €
- *“Cicle de conferencies: “Explorant les fronteres entre els sabers X: De la biologia a les ciències socials, nous reptes en el camp dels sistemes complexos”,* Fundación La Caixa, Investigador: Claudio Mirasso. (2017), Presupuesto: 6000 €

SUPERVISED BACHELOR THESIS

Title: Prevention of Coherence Collapse in Diode Lasers by Dynamic Targeting.

Student: Jeroen Wieland

University: Free University of Amsterdam, The Netherlands.

Year: 1996.

Title: Statistics of Power Dropouts in Semiconductor Lasers with Optical Feedback and Current Modulation

Student: Josep Mulet

University: University de las Islas Baleares.

Year: 1998.

Title: Generación, transmisión y recepción de datos codificados en redes de comunicación.

Student: Pedro Morales

University: Islas Baleares

Year: 2000

Title: Digitalización y transmisión robusta de señales con codificación caótica.

Student: Joan Autonell

University: Islas Baleares

Year: 2002

Title: Desarrollo de un Sistema Codificador/Decodificador de Señales de Audio Mediante Portadora Caótica

Student: Antonio Costa

University: Islas Baleares

Year: 2003

Title: Estudio teórico y computacional de modelos de neuronas acopladas

Student: Isabel Rodríguez

University: Islas Baleares

Year: 2007

Title: Estudio teórico y experimental de la dinámica de un láser de semiconductor sujeto a retroalimentación óptica.

Student: Pilar Vindel Sans

University: Islas Baleares

Year: 2008

Title: Estudio experimental de la dinámica de un láser de semiconductores y aplicaciones

Student: Neus Oliver

University: Islas Baleares

Year: 2010

SUPERVISED MASTER THESIS

Título: Synchronization between populations of neurons

Student: Leonardo Lyra Gollo

Institución: Universidad de Islas Baleares (IFISC)

Year: 2008

Title: Effects of the topology and delayed connections in the synchronization properties of a neuronal network

Student: Guadalupe García

University: Universidad de las Islas Baleares (IFISC)

Year: 2010

Title: Random number generation utilizing chaotic semiconductor lasers

Student: Neus Oliver

University: Universidad de las Islas Baleares (IFISC)

Year: 2012

Title: Semiconductor laser dynamics under polarized rotated optical delay feedback and frequency detuning

Student: Julián Bueno

University: Universidad de las Islas Baleares (IFISC)

Year: 2013

Title: Time learning in one cerebellar purkinje cell.

Student: Daniel Majoral

University: Universidad de las Islas Baleares (IFISC)

Year: 2015

Title: Modeling the Entorhinal Cortex - Dentate Gyrus Circuit

Student: Cristian Estarellas Martin

University: Universidad de las Islas Baleares (IFISC)
Year: 2016

Title: Synchronization in a Neural Mass Model
Student: Ana Alonso
University: Universidad de las Islas Baleares (IFISC)
Year: 2017

Title: Application of a neural mass model to study phase-amplitude coupling
Student: Oscar Gómez Fontana
University: Universidad de las Islas Baleares (IFISC)
Year: 2018

Title: Data analysis and modeling of patient flow in emergency services in hospitals
Student: Joan Perelló
University: Universidad de las Islas Baleares (IFISC), Co-Supervisor: Raúl Toral
Year: 2019

Title: Constructive role of plasticity rules in reservoir computing
Student: Guillermo Barrios
University: Universidad de las Islas Baleares (IFISC), Co-Supervisor: Miguel Cornelles
Year: 2019

Title: Analysis and Simulation of a Palma De Mallorca Hospital Emergency Department
Student: Laura Aviño
University: Universidad de las Islas Baleares (IFISC), Co-Supervisor: Raúl Toral
Year: 2020

Title: Dynamic Information Routing in Neuronal Circuits
Student: Jorge Medina
University: Universidad de las Islas Baleares (IFISC), Co-Supervisor: Víctor Eguíluz
Year: 2020

Title: Modeling the cortical-hippocampal connectivity to resemble in vitro Multi-Electrode recordings.
Student: Eleonora Bernasconi
Institución: University of Genoa, Co-Supervisor: Paolo Massobrio
Year :2021

Title: Effects of passive dendritic arborization on neuronal response in extended integrate and fire models
Student: Jacopo Giorgi
University: Universidad de las Islas Baleares (IFISC).
Year: 2022.

Title: In Search of Anticipated Synchronization in the Dentate Gyrus
Student: Dimitrios Chalkiadakis
University: Universidad de las Islas Baleares (IFISC), Co-Supervisor: Panayiota Poirazi (Foundation of Research and Technology-Hellas, Heraklion, Cretem Greece)
Year: 2022.

SUPERVISED Ph.D. THESIS

Title: Non-Linear Dynamics of Laser Systems: Lyapunov Potentials and Bifurcation Diagrams
Student: Catalina Mayol Serra
University: University de las Islas Baleares (Physics Department)
Year: 2002.

Title: Semiconductor Laser Dynamics: Compound-Cavity, Polarization and Transverse Modes
Student: Josep Mulet Pol
Institution: Departament de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain.
Year: 2002.

Title: Dynamics of non-linear systems: application to synchronization of analogue systems.
Student: Iacyel Gomes Silva
Institution: Departament de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain.
Year: 2006.

Title: Dynamics and Synchronization of Bidirectionally Coupled Semiconductor Lasers.
Student: Raúl Vicente Zafra
Institution: Departament de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain.
Year: 2006.

Title: Synchronization Anticipated Synchronization: Numerical and Theoretical Study
Student: Marzena Cizak
Institution: Departament de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain.
Year: 2006

Title: Dynamics and Synchronization in neuronal models
Student: Antonio Pérez López
Institution: University de las Islas Baleares (IFISC) , Palma de Mallorca, Spain.
Year: 2009.

Title: Dynamics and Synchronization of semiconductor Lasers subject to double cavity feedback
Student: Ilya Ermakov
Institution: University de las Islas Baleares (IFISC) , Palma de Mallorca, Spain.
Year: 2011.

Title: Dynamics and synchronization n neuronal networks in the presence of latency
Student: Leonardo Lyra Gollo
Institution: University de las Islas Baleares (IFISC) , Palma de Mallorca, Spain.
Year: 2012.

Title: Anticipated Synchronization in Neuronal Systems

Student: Fernanda Selingardi Matias

Institution: University de las Islas Baleares (IFISC)/University Federal de Pernambuco
(Mauro Copelli)

Year: 2014.

Title: Computational Properties of Delay-Coupled Systems

Student: Miguel Angel Escalona

Institution: University de las Islas Baleares (IFISC)

Year: 2015.

Title: Gamma oscillations drive the phase of theta waves in the hippocampus to enhance directed functional connectivity during memory processes

Student: Víctor López Madrona

Institution: University Miguel Hernández (Institute of Neurosciences), Supervisors: Santiago Canals and Claudio Mirasso

Year: 2019.

Title: Study of the Influence of the Interneurons in the Information Processing in the Hippocampus Circuit

Student: Cristian Estarellas

Institution: Universidad de las Islas Baleares (IFISC)/Instituto de Neurociencias de Alicante
(Dr. Santiago Canals)

Year: 2020

Title: Study of Information Processing in Neural Circuits

Doctorando: Jaime Sánchez

Institution: Universidad de las Islas Baleares (IFISC)/Instituto de Neurociencias de Alicante
(Dr. Santiago Canals)

Year: 2023

Title: A time-delay reservoir computing neural network based on a single microring resonator with external optical feedback

Doctorando: Jaime Sánchez

Institution: Universidad de las Islas Baleares (IFISC) (Co-supervised with Apostolos Argyris)
/University of Trento (Italy) (Lorenzo Pavesi)

Year: 2023

STAYS IN FOREIGN CENTERS

- Comisión Nacional de Energía Atómica, Buenos Aires (Argentina), 1985-89, Ph.D. Student.
- Physics Department, Science Faculty, University Nacional de Mar de Plata, Buenos Aires (Argentina), 1989-90, Associate Professor.

- Department of Physics and Astronomy, Free University, Amsterdam, Holanda, August 1995- January 1996, Post-doc Student.
- Arizona Center for Mathematical Science, University of Arizona, USA, 27/1/2001 – 2/3/2001, Visiting Scientist.
- Department of Electrical Engineering, University of California Los Angeles, USA, 1/9/2003-31/8/2004.
- Department of Physics, Lehigh University, Bethlehem, PA USA, 15/6/2005-15/7/2005.
- Instituto de Fisiología, Benemérita University Autónoma de Puebla, Mexico, 8/10/2005-15/10/2005.
- Departamento de Física, University Federal de Pernambuco, Brazil, 23/6/2006-18/7/2006.
- Departamento de Física, Universidad Federal de Pernambuco, Brazil, 28/9/2015-27/9/2015; 21/1/2016-7/2/2016; 1/9/2016-17/9/2016 and 22/1/2017-22/2/2017 “Sincronización anticipada en modelos neuronales”

STAYS IN NATIONAL CENTERS

- University de las Islas Baleares, Physics Department, 10/90 a 9/92, “Estancia Postdoctoral para Científicos y Tecnólogos Extranjeros”, Ministerio de Educación y Ciencia – DGICYT.
- University de Cantabria, Department of Modern Physics, 10/92 a 9/93, Visiting Professor.
- University de las Islas Baleares, Physics Department, 10/93 a 9/94, visiting Professor.
- Consejo Superior de Investigaciones Científicas, Instituto de Estructura de la Materia, 11/94 - 10/95.

SCIENTIFIC DISSEMINATION

Responsible of the IFISC Dissemination and Scientific Culture since 2007

- **Publications**

- *"Chaotic Optical Communications"*, Claudio R. Mirasso, Hot Topics, LEOS Newsletters, February 2005, p. 12.
- *"Cuando las neuronas sincronizan sus relojes"* R. Vicente y C. R. Mirasso, MENTE & CEREBRO, number 54, 61, 2012.
- *"50 Years del efecto mariposa"* C. R. Mirasso y E. Hernández-García. ENKI, p. 55, March, 2013.
- *"Los beneficios prácticos de la luz láser compleja"* C. R. Mirasso e I. Fischer, <http://esmateria.com/2013/04/12/los-beneficios-practicos-de-la-luz-laser-caotica/>, 12/4/2013.

- **Conferences**

- *"Los láseres: cómo funcionan y para qué sirven"*, Science Week (2007, 2008, 2009, 2010).
- *"El láser: 50 Years de una invención que cambió nuestras vidas"*, inaugural conference of the Week Science and Technology, Palma de Mallorca, 2010. *"El láser: 50 Years de una invención que cambió nuestras vidas"*, Museo de Menorca, Mahon, 2010.

- **Event organization**

- *Conference Series "Explorant les Fronteres entre els Sabers"*, 7 editions, 2008-2017.
- *IFISC Stand Manager at Science Fair Balears, 2009-2011*
- *Course Organizer "Opening science"*, coordinated by CaixaForum Barcelona, Palma February to May 2013.

- **Scientific culture projects**

- *EXPLORANT: Explorant les Fronteres entre els Sabers II*. [AAEE0070/08] Acciones Especiales, Govern Balear. Investigator: Claudio Mirasso (2009), Budget: 2.500 €
- *Ciudad Europea de la Ciencia y la Innovación 2010*. [FCT-09-1622] FECYT. Investigator: Claudio Mirasso (2009-2010), Budget: 20.000 €.
- *Explorant4: Explorant les Fronteres entre els Sabers IV*. [AAEE187/09]. Acciones Especiales. Govern Balear. Investigator: Claudio Mirasso (2011), Budget: 6.000 €.
- *Abriendo la Ciencia, Fundación La Caixa*, Budget: 9000 €.
- *Divulga@IFISC*, [AAEE008/2012] Direcció General d'Universitats, Recerca i Transfèrència del Coneixement, Govern Balear, Investigator: Claudio Mirasso. (2011), Budget: 8157,5 €.
- *DERR@IFISC (Difusió i Explotació dels Resultats de Recerca)* Investigator: Claudio Mirasso. (2015), Budget: 18950 €.
- *Conference Series: "Explorant les fronteres entre els sabers IX: de la intel·ligència humana a la intel·ligència artificial"* Fundació La Caixa, Investigator: Claudio Mirasso. (2016), Budget: 5937,5 €
- *"Conference Series: "Explorant les fronteres entre els sabers X: De la biologia a les ciències socials, nous reptes en el camp dels sistemes complexos"*, Fundació La Caixa,

Investigator: Claudio Mirasso. (2017), Budget: 6000 €

OTHER MERITS

FELLOWSHIPS

- Comisión de Investigaciones Científicas de la Provincia de Buenos Aires, Argentina, 1984-1987 (Ph.D., 3 years).
- Comisión de Investigaciones Científicas de la Provincia de Buenos Aires, Argentina, 1987-1989 (Ph.D., 2 years).
- Post Doctoral position, funded by the Ministerio de Educación y Ciencia, España, 1990-1992, University de las Islas Baleares, Spain.
- Post Doctoral position, "Human Capital and Mobility Program" of the European Commission, Holland, August 1995 - January 1996.

OTHERS

- Participant of Ph.D. thesis committees:
 - Angel Valle, University de Cantabria, Spain, 1993.
 - Margalida Homar, University de las Islas Baleares, Spain, 1996.
 - Jaume Dellunde, University de Barcelona, Spain, 1996.
 - Josep Martín regalado, University de las Islas Baleares, Spain, 1997.
 - José Revuelta Ceballos, University de Cantabria, Spain, 1998.
 - Nasr Mustafa, University de Cantabria, Spain, 1999.
 - Angel Sánchez-Díaz, University Complutense de Madrid, Spain, 1999.
 - Nahed Dokhaned, Universite de Nice, France, 2000.
 - Juan Diego Ania, University de Oviedo, Spain, 2000.
 - Fabien Rogister, Facultat Politècnica du Mons, Bélgica, 2001.
 - Bob Nagler, Vrije Universiteit Brussel, 2003.
 - Javier Martín Buldú, Universitat Politècnica de Catalunya, 2003.
 - Miguel Cornelles, Free University of Brussels, Bélgica, 2006.
 - Claudio Tessone, Universitat de les Illes Baears, 2006.
 - Yanne Chembou, Universitat de les Illes Baears, 2006.
 - Silvia Martínez, Universitat Politècnica de Catalunya, Spain 2009.
 - Roman Lavrov, Université de Franche-Comte, France, 2010.
 - Lendert Gelens, Free University of Brussels, Belgium, 2010.
 - Romain Modeste Nguimdo, Universitat de les Illes Baears, 2011.
 - Jordi Tiana Alsina, Universitat Politècnica de Catalunya, 2011.
 - Modeste Nguindo, Universitat de les Illes Baears, 2012.
 - Diana Arroyo, Centro de Investigaciones Ópticas, León, México, 2013.
 - Belen Sancristobal, Univesitat Politècnica de Catalunya, 2013.
 - Jade Martínez Linares, Universitat de les Illes Baears, 2016.
 - Edison Javier Rosero Salazar, Universidade Federal de Pernambuco, 2017.
 - Mariano Alberto García Vellisca, Universidad Politècnica de Madrid, 2017.

Juan García Prieto, Universidad de La Laguna, 2018.
Sandra Pusil, Universidad Politécnica de Madrid, 2018.
Federico José Machado Olivares, Univesitat Politècnica de València, 2018
Andrés Balbino, Universidad de Buenos Aires, 2018.

- Censor of the journal: IEEE J. of Quantum Electronics, IEEE Photonics Technology Letters, Optics Letters, Applied Physics Letters, IEE Proceedings Optoelectronics, Physical Review, Journal of the Optical Society of America, etc.
- Professor of the Agencia Española de Cooperación Internacional, Acción I, 1996/97.
- Tutor Professor of 2 Intercampus students, Agencia Española de Cooperación Internacional: 1997, 2000.
- Guest Editor of the Special Issue of the IEE Proceedings Optoelectronics "Semiconductor Optoelectronics", February de 1998.
- Guest Editor of the Feature Section of the IEEE Journal of Quantum Electronics, "Optical Chaos and Applications to Cryptography", September, 2002.
- Member of the committee of the conference "Physics and Simulations of Optoelectronics Devices", Photonics West, SPIE Meetings.
- Member of the committee for evaluation of Marie-Curie fellowships, European Commission.
- Member of the Technical Committee of the conference "European Quantum Electronic Conference", sub-committee: "Semiconductor Lasers", Munich, Germany, June 2003.
- Member of the Technical Program Committee of the "Semiconductor Laser and Laser Dynamics Conference" organized as part of SPIE's International Symposium on Photonics Europe, Strasbourg, France, April 2004.
- Member of the Technical Program Committee of the "CLEO Focus meeting, Nonlinear, Quantum and Chaotic Optics: New Directions in Photonics and Optical Communications", Cannes, France September, 2006
- Co-Chairman of the Symposium "'Cryptographic Techniques in Photonics", CLEO/Europe-IQEC, Munich, Germany 2007.
- Member of the Technical Program Committee of the Solvay Workshop: "Bits, quanta and complex systems: modern approaches to photonics information processing", Brussels, Belgium, May 2008.
- Member of the Committee of the Conference CLEO/Europe-EQEC 2009, Topic "Semiconductor Lasers", Munich, Germany, June 2009.

- Co-Chairman of the Workshop CATS, “International Workshop on Chaos Applications in Telecommunications and Sensing, Chania, Crete, Greece, June 2009.
- Co-Chairman of the Workshop BSYNC09, “Synchronization and Multiscale Complex Dynamics in the Brain”, Dresden, Germany, November 2009.
- Co-Chairman of the Conference NOLTA 2012, “International Symposium on Nonlinear Theory and its Applications, Mallorca, Spain, October 2012.
- Invited Editor of the section: “*Special section on recent progress in nonlinear theory and its applications*”, IEICE, vol. 4, no. 4, DOI: 10.1588/nolta.4.1, 2013.
- Evaluator of “Agencia Nacional de Evaluación y Prospectiva”.
- Evaluator of “Agència de Gestió d’Ajuts Universitaris i de Recerca” de Catalunya.
- Evaluator of “Research Grants Council”, Hong Kong.
- Evaluator of “Agencia Nacional de Promoción Científica y Tecnológica”, Argentina
- Member del Evaluation Committee of ANECA (Agencia Nacional de Evaluación de la Calidad y la Acreditación) for the “Programa de Evaluación del Profesorado”, 2011-2015.
- Visiting Professor, University of Northumbria, UK, 23/5/2013-22/5/2016.
- Visiting Professor, Universidade Federal de Pernambuco, Brazil, 2015-2017.
- Member of the Program Organizing Committee of the Computational Neuroscience Conference, 2019-2022.
- Associate Editor of the Journal Biology, Neuroscience section, since 2020.