



## **MIGUEL CORNELLES SORIANO**

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**MIGUEL CORNELLES SORIANO**

Surname(s): **CORNELLES SORIANO**  
 Name: **MIGUEL**  
 DNI: **20241268A**  
 ORCID: **0000-0002-6140-8451**  
 ScopusID: **7005888473**  
 ResearcherID: **D-8480-2011**  
 Date of birth: **14/12/1979**  
 Gender: **Male**  
 Country of birth: **Spain**  
 Aut. region/reg. of birth: **Valencian Community**  
 City of birth: **Benicarló**  
 Land line phone: **971171314**  
 Email: **miguel@ifisc.uib-csic.es**  
 Personal web page: **https://ifisc.uib-csic.es/miguel/**

**Current professional situation**

**Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency

**Department:** IFISC (CSIC-UIB)

**Professional category:** Tenured scientist

**Start date:** 01/01/2024

**Type of contract:** Civil servant

**Dedication regime:** Full time

**Primary (UNESCO code):** 220913 - Non-linear optics

**Secondary (UNESCO code):** 220910 - Lasers

**Tertiary (UNESCO code):** 120304 - Artificial intelligence

**Performed tasks:** Miguel C. Soriano (Miguel Cornelles Soriano) is a tenured scientist (Científico Titular) at the Spanish Research Council, and he develops his research activity at the Instituto de Física Interdisciplinar y Sistemas Complejos (IFISC). His research career has been devoted to the study of the fundamental properties of complex dynamical systems, with a balanced interplay between theoretical and experimental work, and to the development of brain-inspired hardware devices. He has co-authored 91 scientific publications in JCR journals, with 6001 citations and H-index 31 in web of Science (please see <http://www.researcherid.com/rid/D-8480-2011> for more details) and 9347 citations and H-index 39 according to Google scholar (please see <https://scholar.google.com/citations?user=RMIYpeYAAAAJ> for more details).

**Previous positions and activities**

	<b>Employing entity</b>	<b>Professional category</b>	<b>Start date</b>
<b>1</b>	Universidad de las Islas Baleares	Associate professor (Profesor Contratado Doctor)	01/12/2021
<b>2</b>	IFISC (CSIC-UIB)	Ramón y Cajal research associate	01/12/2016
<b>3</b>	University of the Balearic Islands	Postdoctoral research associate	01/02/2015
<b>4</b>	University of the Balearic Islands		01/01/2011



	Employing entity	Professional category	Start date
		Assistant Professor (Profesor Ayudante Doctor)	
5	IFISC (CSIC-UIB)	Juan de la Cierva research contract	01/01/2008
6	IMEDEA (UIB-CSIC)	Postdoctoral contract	08/01/2007
7	Vrije Universiteit Brussel	PhD research	01/10/2002

- 1** **Employing entity:** Universidad de las Islas Baleares **Type of entity:** University  
**Department:** Physics, IFISC (CSIC-UIB)  
**Professional category:** Associate professor (Profesor Contratado Doctor)  
**Start-End date:** 01/12/2021 - 31/12/2023  
**Type of contract:** Permanent employment contract
- 2** **Employing entity:** IFISC (CSIC-UIB)  
**Professional category:** Ramón y Cajal research associate  
**Start-End date:** 01/12/2016 - 30/11/2021 **Duration:** 5 years
- 3** **Employing entity:** University of the Balearic Islands  
**Professional category:** Postdoctoral research associate  
**Start-End date:** 01/02/2015 - 30/11/2016
- 4** **Employing entity:** University of the Balearic Islands  
**Professional category:** Assistant Professor (Profesor Ayudante Doctor)  
**Start-End date:** 01/01/2011 - 31/01/2015 **Duration:** 4 years
- 5** **Employing entity:** IFISC (CSIC-UIB)  
**Professional category:** Juan de la Cierva research contract  
**Start date:** 01/01/2008 **Duration:** 3 years
- 6** **Employing entity:** IMEDEA (UIB-CSIC)  
**Professional category:** Postdoctoral contract  
**Start date:** 08/01/2007 **Duration:** 8 months
- 7** **Employing entity:** Vrije Universiteit Brussel  
**Professional category:** PhD research  
**Start date:** 01/10/2002 **Duration:** 4 years - 2 months - 18 days



## Education

### University education

#### 1st and 2nd cycle studies and pre-Bologna degrees

**University degree:** Higher degree

**Name of qualification:** Ingeniería Superior en Telecomunicaciones

**Degree awarding entity:** Universitat Politècnica de Catalunya

**Date of qualification:** 30/09/2002

#### Doctorates

**Doctorate programme:** Ph.D. in Applied Physics and Photonics

**Degree awarding entity:** Vrije Universiteit Brussel    **Type of entity:** University

**Date of degree:** 18/12/2006

**Thesis title:** Aspects of feedback and noise in Vertical-Cavity Surface-Emitting Lasers

**Thesis director:** Jan Danckaert and Ingo Fischer

**Obtained qualification:** Greatest Distinction

**Standardised degree:** Yes

**Date of standardisation:** 17/07/2007

### Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
French	B1	B1	A1	A1	A1
Italian	B1	B1	A1	A1	A1
Catalan	C1	C1	C1	C1	C1
English	C1	C1	C1	C1	C1
Spanish	C1	C1	C1	C1	C1

## Teaching experience

### General teaching experience

**1 Type of teaching:** Official teaching

**Name of the course:** Machine Learning

**University degree:** Estudios de Master (Master in Physics of Complex Systems)

**Start date:** 2021

**End date:** 2024

**Type of hours/ ECTS credits:** Credits

**Hours/ECTS credits:** 3

**Entity:** Universidad de las Islas Baleares

**Type of entity:** University

**Subject language:** English



- 2** **Type of teaching:** Official teaching  
**Name of the course:** Photonics: Lasers and Applications  
**University degree:** Estudios de Grado (Física)  
**Frequency of the activity:** 4  
**Start date:** 2018 **End date:** 2022  
**Type of hours/ ECTS credits:** Hours  
**Hours/ECTS credits:** 20  
**Entity:** Universidad de las Islas Baleares **Type of entity:** University
- 3** **Type of teaching:** Official teaching  
**Name of the course:** Physics and Electromagnetism  
**University degree:** Estudios de Grado (Química, Biología, Bioquímica, Ingeniería Informática)  
**Start date:** 2010 **End date:** 2014  
**Type of hours/ ECTS credits:** Hours  
**Hours/ECTS credits:** 560  
**Entity:** Universidad de las Islas Baleares **Type of entity:** University

## Experience supervising doctoral thesis and/or final year projects

- 1** **Project title:** Computing with Dynamical Systems: from implementations towards novel concepts  
**Type of project:** Doctoral thesis  
**Co-director of thesis:** Ingo Fischer; Claudio R. Mirasso; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Mirko Goldmann  
**Obtained qualification:** Excelente  
**Date of reading:** 04/10/2024
- 2** **Project title:** Reservoir computing in quantum systems  
**Type of project:** Doctoral thesis  
**Co-director of thesis:** Roberta Zambrini; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Rodrigo Martínez Peña  
**Obtained qualification:** Excelente  
**Date of reading:** 07/09/2023  
**Quality recognition:** Yes
- 3** **Project title:** Artificial neural networks through the lens of dynamical systems theory  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Lucas Lacasa; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Kaloyan Danovski  
**Obtained qualification:** Excellent  
**Date of reading:** 2023
- 4** **Project title:** Time and wavelength multiplexing in photonic neural networks  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Claudio R. Mirasso; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Pedro Jiménez González



**Obtained qualification:** 8.9/10  
**Date of reading:** 2023

- 5** **Project title:** Influence of Measurements on Continuous Variable Quantum Reservoir Computing  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Roberta Zambrini; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Jorge García Beni  
**Obtained qualification:** Excellent  
**Date of reading:** 2021
- 6** **Project title:** Fundamentals of Information Processing on an Analog Reservoir Computer  
**Type of project:** Master's Thesis  
**Co-director of thesis:** André Röhm; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Benedikt Vettelschoss  
**Obtained qualification:** Excellent  
**Date of reading:** 2020
- 7** **Project title:** Constructive role of plasticity rules in reservoir computing  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Claudio R. Mirasso; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Guillermo Barrios  
**Obtained qualification:** Excellent  
**Date of reading:** 2019
- 8** **Project title:** Information processing using optoelectronic delayed systems: Influence of an additional delay  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Jesús Yelo  
**Obtained qualification:** Excellent  
**Date of reading:** 2019
- 9** **Project title:** Multilayer reservoir computing to overcome the memory-nonlinearity trade-off  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Samuel Jaume Suárez  
**Obtained qualification:** Excellent  
**Date of reading:** 2019
- 10** **Project title:** Phase space reconstruction of semiconductor laser dynamics using reservoir computing  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Alejandro Cunillera Pérez  
**Obtained qualification:** Excellent  
**Date of reading:** 2019



- 11** **Project title:** Autonomous dynamical systems based on hardware implementations of delay-reservoir computers  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Irene Estébanez  
**Obtained qualification:** Excellent  
**Date of reading:** 2018
- 12** **Project title:** Improved detection of collective rhythms in multi-channel electroencephalography signals  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Alejandro Morán Costoya  
**Obtained qualification:** Excellent  
**Date of reading:** 2017
- 13** **Project title:** Análisis experimental de la sincronización de osciladores caóticos y su aplicación en la distribución segura de claves  
**Type of project:** End of course project  
**Co-director of thesis:** Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Yeray Vivó Valls  
**Obtained qualification:** 8.6/10  
**Date of reading:** 2016
- 14** **Project title:** Complex Dynamics of Delay-Coupled Semiconductor Lasers: Fundamentals and Applications  
**Type of project:** Doctoral thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Xavier Porte Parera  
**Obtained qualification:** Excelente  
**Date of reading:** 30/11/2015  
**European doctorate:** Yes
- 15** **Project title:** Computational Properties of Delay-Coupled Systems  
**Type of project:** Doctoral thesis  
**Co-director of thesis:** Claudio R. Mirasso; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Miguel Angel Escalona Moran  
**Obtained qualification:** Excelente  
**Date of reading:** 18/09/2015
- 16** **Project title:** Photonic Reservoir Computing: The role of the Mach-Zehnder modulator  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Miquel Alfaras Espinàs  
**Obtained qualification:** Excellent  
**Date of reading:** 2015





- 17** **Project title:** Semiconductor laser dynamics under polarized rotated optical delay feedback and frequency detuning  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Claudio R. Mirasso; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Julián Bueno  
**Obtained qualification:** 8/10  
**Date of reading:** 2013
- 18** **Project title:** Random number generation utilizing chaotic semiconductor lasers  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Neus Oliver  
**Obtained qualification:** Excellent  
**Date of reading:** 2012
- 19** **Project title:** Synchronization characteristics of fiber delay-coupled semiconductor lasers  
**Type of project:** Master's Thesis  
**Co-director of thesis:** Ingo Fischer; Miguel Cornelles Soriano  
**Entity:** University of the Balearic Islands  
**Student:** Xavier Porte Parera  
**Obtained qualification:** Excellent  
**Date of reading:** 2011

## Scientific and technological experience

### Scientific or technological activities

#### R&D projects funded through competitive calls of public or private entities

- 1** **Name of the project:** Information processing using laser networks (INFOLANET)  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Miguel C. Soriano; Apostolos Argyris  
**Nº of researchers:** 4  
**Funding entity or bodies:**  
MCIUN - Ministerio de Ciencia, Innovación y Universidades  
**Code according to the funding entity:** PID2019- 109094GB-C22  
**Start-End date:** 01/09/2023 - 30/08/2026  
**Total amount:** 127.500 €
- 2** **Name of the project:** ADOPD: Adaptive Optical Dendrites  
**Entity where project took place:** Universidad de las Islas Baleares  
**Name principal investigator (PI, Co-PI....):** Claudio Mirasso  
**Funding entity or bodies:**  
Horizon 2020  
**Type of participation:** Team member





**Code according to the funding entity:** FET-Open Challenging Current Thinking (899265)  
**Start-End date:** 2020 - 2024 **Duration:** 3 years - 6 months  
**Total amount:** 387.000 €

**3** **Name of the project:** POST-DIGITAL  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Ingo Fischer  
**Funding entity or bodies:**  
European Commission  
**Type of participation:** Team member  
**Name of the programme:** Innovative Training Networks (ITN)  
**Code according to the funding entity:** H2020-MSCA-ITN-2019  
**Start-End date:** 2020 - 2024  
**Total amount:** 500.000 €

**4** **Name of the project:** QuaResC: Quantum Reservoir Computing and Nonlinear Dynamical Systems  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Miguel C. Soriano  
**Nº of researchers:** 6  
**Funding entity or bodies:**  
MCIUN - Ministerio de Ciencia, Innovación y Universidades  
**Code according to the funding entity:** PID2019- 109094GB-C22  
**Start-End date:** 01/06/2020 - 31/05/2023  
**Total amount:** 45.980 €

**5** **Name of the project:** QuaReC: Machine learning with quantum reservoir computing  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Zambrini, R.  
**Nº of researchers:** 8  
**Funding entity or bodies:**  
Balear Government  
**Type of participation:** Team member  
**Code according to the funding entity:** PRD2018/47  
**Start-End date:** 2020 - 2023  
**Total amount:** 99.750 €

**6** **Name of the project:** Unidad de excelencia María de Maeztu  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Claudio R. Mirasso  
**Funding entity or bodies:**  
Agencia Estatal de Investigación  
**Type of participation:** Team member  
**Name of the programme:** Subprograma Estatal de Fortalecimiento Institucional  
**Code according to the funding entity:** MDM-2017-0711  
**Start-End date:** 2018 - 2022  
**Total amount:** 2.000.000 €



- 7** **Name of the project:** Ibersinc3: Red sobre Dinámica y Sincronización en Redes Complejas  
**Geographical area:** National  
**Degree of contribution:** Local Principal Investigator  
**Entity where project took place:** Universitat Rovira i Virgili **Type of entity:** University  
**Name principal investigator (PI, Co-PI....):** Alejandro Arenas Moreno  
**N° of researchers:** 50  
**Name of the programme:** Ministerio de Economía y Competitividad (Acciones de Dinamización “Redes de Excelencia”)  
**Code according to the funding entity:** FIS2017-90782-REDT  
**Start-End date:** 01/01/2019 - 31/12/2020  
**Participating entity/entities:** INSTITUTO DE FISICA INTERDISCIPLINAR Y SISTEMAS COMPLEJOS  
**Total amount:** 17.000 €
- 8** **Name of the project:** IDEA: Improving data DEcoding in optical communication networks All-optically using neuro-inspired photonic systems  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Claudio R. Mirasso; Miguel C. Soriano  
**N° of researchers:** 4  
**Funding entity or bodies:**  
Ministerio de Economía y Competitividad  
**Code according to the funding entity:** TEC2016-80063-C3  
**Start-End date:** 2016 - 2019  
**Total amount:** 46.585 €
- 9** **Name of the project:** Ibersinc2: Red sobre Dinámica y Sincronización en Redes Complejas  
**Geographical area:** National  
**Degree of contribution:** Local Principal Investigator  
**Entity where project took place:** Universitat Rovira i Virgili **Type of entity:** University  
**Name principal investigator (PI, Co-PI....):** Alejandro Arenas Moreno  
**N° of researchers:** 50  
**Name of the programme:** Ministerio de Economía y Competitividad (Acciones de Dinamización “Redes de Excelencia”)  
**Code according to the funding entity:** FIS2015-71929-REDT  
**Start-End date:** 01/01/2016 - 31/12/2017  
**Participating entity/entities:** INSTITUTO DE FISICA INTERDISCIPLINAR Y SISTEMAS COMPLEJOS  
**Total amount:** 35.000 €
- 10** **Name of the project:** Towards brain-inspired efficient photonic information processing (TRIPHOP)  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Ingo Fischer  
**N° of researchers:** 10  
**Funding entity or bodies:**  
Ministerio de Economía y Competitividad  
**Code according to the funding entity:** TEC2012-36335  
**Start-End date:** 2013 - 2015  
**Total amount:** 278.460 €



- 11 Name of the project:** Ibersinc: Red sobre Dinámica y Sincronización en Redes  
**Geographical area:** National  
**Degree of contribution:** Local Principal Investigator  
**Entity where project took place:** Universidad Rey Juan Carlos **Type of entity:** University  
**Name principal investigator (PI, Co-PI....):** Javier Martín Buldú  
**N° of researchers:** 71  
**Name of the programme:** Ministerio de Ciencia e Innovación ("Subprograma de Acciones complementarias a los proyectos de investigación fundamental no orientada")  
**Start-End date:** 01/01/2010 - 31/12/2012  
**Participating entity/entities:** INSTITUTO DE FISICA INTERDISCIPLINAR Y SISTEMAS COMPLEJOS  
**Total amount:** 27.600 €
- 12 Name of the project:** DeCoDicA: 'Delay-Coupled Diode Lasers for Photonic Applications'  
**Entity where project took place:** IFISC  
**Name principal investigator (PI, Co-PI....):** Ingo Fischer  
**Funding entity or bodies:** Ministerio de Ciencia e Innovación **Type of entity:** Body, others  
**Code according to the funding entity:** TEC2009-14101  
**Start date:** 2010 **Duration:** 3 years  
**Total amount:** 236.313 €
- 13 Name of the project:** PHOCUS: 'Towards a PHOtonic liquid state machine based on delay-CoUpled Systems'  
**Entity where project took place:** Universidad de las Islas Baleares  
**Name principal investigator (PI, Co-PI....):** Claudio Mirasso  
**Funding entity or bodies:** VII Programa Marco de la Unión Europea  
**Code according to the funding entity:** FP7-ICT-2009-C No. 240763  
**Start date:** 2010 **Duration:** 3 years  
**Total amount:** 1.808.566 €
- 14 Name of the project:** PICASSO: 'Photonic Integrated Components Applied to Secure Chaos Encoded Optical communication systems'  
**Entity where project took place:** Universidad de las Islas Baleares  
**Name principal investigator (PI, Co-PI....):** Claudio Mirasso  
**Funding entity or bodies:** VI Programa Marco I+D Comisión Europea  
**Code according to the funding entity:** IST-2005-34551  
**Start date:** 2006 **Duration:** 4 years  
**Total amount:** 250.000 €
- 15 Name of the project:** 'CONOCE2: Cooperación y fenómenos no lineales en sistemas complejos extendidos'  
**Degree of contribution:** Researcher  
**Entity where project took place:** Universidad de las Islas Baleares  
**Name principal investigator (PI, Co-PI....):** M. San Miguel  
**Funding entity or bodies:** Ministerio de Educación y Ciencia



**Code according to the funding entity:** FIS2004-00953

**Start date:** 2004

**Duration:** 5 years

**Total amount:** 302.500 €

- 16 Name of the project:** COST Action 288: Nanoscale and ultrafast Photonics  
**Entity where project took place:** Vrije Universiteit Brussel  
**Name principal investigator (PI, Co-PI....):** Jan Danckaert  
**Funding entity or bodies:**  
European Science Foundation (ESF)  
**Start date:** 2003
- 17 Name of the project:** Interuniversity Attraction Pole (IAP) Photon Network: 'Photons and photonics: From basic physics to new system concepts'  
**Entity where project took place:** Vrije Universiteit Brussel  
**Name principal investigator (PI, Co-PI....):** Irina Veretennicoff  
**Funding entity or bodies:**  
Belgian Federal Science Policy Office  
**Start date:** 2002
- 18 Name of the project:** Training in Amsterdam: interdisciplinary laser-oriented research  
**Entity where project took place:** University of Amsterdam  
**Name principal investigator (PI, Co-PI....):** Willem Hogervost  
**Funding entity or bodies:**  
European Commission  
**Start date:** 2000  
**Total amount:** 250.000 €
- 19 Name of the project:** VCSELs for Information Society Technology Applications (VISTA)  
**Entity where project took place:** Vrije Universiteit Brussel  
**Name principal investigator (PI, Co-PI....):** Jan Danckaert  
**Funding entity or bodies:**  
Comunidad Económica Europea  
**Start date:** 2000  
**Total amount:** 233.360 €

### R&D non-competitive contracts, agreements or projects with public or private entities

- 1 Name of the project:** Research Cooperation Agreement between Smart Solutions Technologies S.L. (Spain) and the University of the Balearic Islands (UIB, Spain)  
**Degree of contribution:** Scientific coordinator  
**Name principal investigator (PI, Co-PI....):** Soriano, M. C.; Mirasso, Claudio R.  
**Nº of researchers:** 4  
**Start date:** 2015 **Duration:** 1 year  
**Total amount:** 90.750 €
- 2 Name of the project:** Research Cooperation Agreement between XARION Laser Acoustics GmbH (Austria) and the University of the Balearic Islands (UIB, Spain)  
**Degree of contribution:** Researcher



**Name principal investigator (PI, Co-PI...):** Fischer, Ingo; Mirasso, Claudio R.  
**Nº of researchers:** 4  
**Participating entity/entities:** XARION Laser Acoustics GmbH  
**Start date:** 2014 **Duration:** 1 year  
**Total amount:** 31.250 €

## Results

### Industrial and intellectual property

- 1 **Title registered industrial property:** Sistema y Métodos para la Clasificación de Latidos Cardiacos Relacionados con Arritmia  
**Inventors/authors/obtainers:** X. Ibáñez Català; S. Ortín González; M. Cornelles Soriano; C. R. Mirasso Santos  
**Entity holder of rights:** Smart Solutions Technologies, S.L.  
**Nº of application:** 201730826  
**Country of inscription:** Spain  
**Date of register:** 2017
- 2 **Title registered industrial property:** System And Methods For Classifying Arrhythmia-Related Heartbeats  
**Inventors/authors/obtainers:** X. Ibáñez Català; S. Ortín González; M. Cornelles Soriano; C. R. Mirasso Santos  
**Entity holder of rights:** Smart Solutions Technologies, S.L.  
**Nº of application:** US15/638,263  
**Country of inscription:** United States of America  
**Date of register:** 2017

## Scientific and technological activities

### Scientific production

#### Publications, scientific and technical documents

- 1 R. Martínez-Peña; J. Nokkala; G. L. Giorgi; R. Zambrini; M. C. Soriano. Information Processing Capacity of Spin-Based Quantum Reservoir Computing Systems. Cognitive Computation. 15, pp. 1440 - 1451. 09/2023. Available on-line at: <<https://doi.org/10.1007/s12559-020-09772-y>>. ISSN 1866-9964  
**Type of production:** Scientific paper **Format:** Journal  
**Relevant publication:** Yes
- 2 Soriano, M.C.; Ortin, S.; Keuninckx, L.; Appeltant, L.; Danckaert, J.; Pesquera, L.; Van der Sande, G. Delay-based Reservoir Computing: Noise Effects in a Combined Analog and Digital Implementation. IEEE Transactions On Neural Networks And Learning Systems. 26 - 2, pp. 388 - 393. (United States of America): IEEE, 2015. Available on-line at: <10.1109/TNNLS.2014.2311855>. ISSN 2162-237X  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - COMPUTER SCIENCE, HARDWARE & ARCHITECTURE  
**Impact index in year of publication:** 4.85 **Journal in the top 25%:** Yes

**Position of publication:** 1

**Source of citations:** WOS

**Relevant publication:** Yes

**No. of journals in the cat.:** 51

**Citations:** 61

- 3** Soriano, M.C.; Garcia-Ojalvo, J.; Mirasso, C.R.; Fischer, I. Complex photonics: Dynamics and applications of delay-coupled semiconductors lasers. *Reviews of Modern Physics*. 85 - 1, pp. 421 - 470. 2013. Available on-line at: <10.1103/RevModPhys.85.421>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 42.86

**Position of publication:** 1

**Source of citations:** WOS

**Relevant publication:** Yes

**Format:** Journal

**Category:** Science Edition - PHYSICS, MULTIDISCIPLINARY

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 78

**Citations:** 288

- 4** Brunner, D.; Soriano, M.C.; Mirasso, C.R.; Fischer, I. Parallel photonic information processing at gigabyte per second data rates using transient states. *Nature Communications*. 4, pp. 1364. 2013. Available on-line at: <10.1038/ncomms2368>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 10.74

**Position of publication:** 3

**Source of citations:** WOS

**Relevant publication:** Yes

**Format:** Journal

**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 55

**Citations:** 408

- 5** Larger, L.; Soriano, M.C.; Brunner, D.; Appeltant, L.; Gutierrez, J.M.; Pesquera, L.; Mirasso, C.R.; Fischer, I. Photonic information processing beyond Turing: an optoelectronic implementation of reservoir computing. *Optics Express*. 20, pp. 3241 - 3249. 2012. Available on-line at: <http://www.opticsinfobase.org/oe/abstract.cfm?URI=oe-20-3-3241>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 3.546

**Position of publication:** 5

**Source of citations:** WOS

**Relevant publication:** Yes

**Format:** Journal

**Category:** Science Edition - OPTICS

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 80

**Citations:** 242

- 6** Soriano, M.C.; Van der Sande, G.; Fischer, I.; Mirasso, C.R. Synchronization in simple network motifs with negligible correlation and mutual information measures. *Physical Review Letters*. 108, pp. 134101. 2012. Available on-line at: <http://prl.aps.org/abstract/PRL/v108/i13/e134101>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 7.94

**Position of publication:** 5

**Source of citations:** WOS

**Relevant publication:** Yes

**Format:** Journal

**Category:** Science Edition - PHYSICS, MULTIDISCIPLINARY

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 83

**Citations:** 30



- 7** Appeltant, L.; Soriano, M.C.; Van der Sande, G.; Danckaert, J.; Massar, S.; Dambre, J.; Schrauwen, B.; Mirasso, C.R.; Fischer, I.. Information processing using a single dynamical node as complex system. Nature Communications. 2, pp. 468. 2011.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - MULTIDISCIPLINARY SCIENCES  
**Impact index in year of publication:** 7.396 **Journal in the top 25%:** Yes  
**Position of publication:** 3 **No. of journals in the cat.:** 56  
**Source of citations:** WOS **Citations:** 590  
**Relevant publication:** Yes
- 8** Soriano, M.C.; Zunino, L.; Rosso, O.A.; Fischer, I.; Mirasso, C.R. Time Scales of a Chaotic Semiconductor Laser With Optical Feedback Under the Lens of a Permutation Information Analysis. IEEE Journal of Quantum Electronics. 47, pp. 252 - 261. 2011. Available on-line at: <<http://dx.doi.org/10.1109/JQE.2010.2078799>>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC  
**Impact index in year of publication:** 1.879 **Journal in the top 25%:** Yes  
**Position of publication:** 54 **No. of journals in the cat.:** 245  
**Source of citations:** WOS **Citations:** 138  
**Relevant publication:** Yes
- 9** Photonic Reservoir Computing: Optical Recurrent Neural Networks; Ed. by D. Brunner, M. C. Soriano, and G. Van der Sande. pp. 1 - 264. (Germany): De Gruyter, 2019. ISBN 978-3-11-058349-6  
**Type of production:** Edited Book **Format:** Book  
**Relevant publication:** Yes
- 10** Abreu, S.; Boikov, I.; Goldmann, M.; Jonuzi, T.; Lupo, A.; Masaad, S.; Nguyen, L.; Picco, E.; Pourcel, G.; Skalli, A.; Talandier, L.; Vettelschoss, B.; Vlieg, E. A.; Argyris, A.; Bienstman, P.; Brunner, D.; Dambre, J.; Daudet, L.; Domenech, J. D.; Fischer, I.; Horst, F.; Massar, S.; Mirasso, C. R.; Offrein, B. J.; Rossi, A.; Soriano, M. C.; Sygletos, S.; Turitsyn, S. K.. A photonics perspective on computing with physical substrates. Reviews in Physics. 12, pp. 100093. 12/2024. Available on-line at: <<https://doi.org/10.1016/j.revip.2024.100093>>.  
**Type of production:** Scientific paper **Format:** Journal  
**Corresponding author:** Yes
- 11** Danovski, K.; Soriano, M. C.; Lacasa, L.. Dynamical stability and chaos in artificial neural network trajectories along training. Frontiers in Complex Systems. 2, pp. 1367957. 05/2024. Available on-line at: <<https://www.frontiersin.org/articles/10.3389/fcpxs.2024.1367957>>.  
**Type of production:** Scientific paper **Format:** Journal
- 12** Henaff, J.; Ansquer, M.; Soriano, M. C.; Zambrini, R.; Treps, N.; Parigi, V.. Optical phase encoding in a pulsed approach to reservoir computing. Optics Letters. 49, pp. 2097 - 2100. 04/2024. Available on-line at: <<https://opg.optica.org/ol/abstract.cfm?uri=ol-49-8-2097>>.  
**Type of production:** Scientific paper **Format:** Journal
- 13** Martínez-Peña, R.; Soriano, M. C.; Zambrini, R.. Quantum fidelity kernel with a trapped-ion simulation platform. Physical Review A. 109, pp. 042612. 04/2024. Available on-line at: <<https://link.aps.org/doi/10.1103/PhysRevA.109.042612>>.  
**Type of production:** Scientific paper **Format:** Journal





- 14** Sannia, A.; Martínez-Peña, R.; Soriano, M. C.; Giorgi, G. L.; Zambrini, R.. Dissipation as a resource for Quantum Reservoir Computing. *Quantum*. 8, pp. 1291. 03/2024. Available on-line at: <<https://doi.org/10.22331/q-2024-03-20-1291>>.  
**Type of production:** Scientific paper **Format:** Journal
- 15** García-Beni, J.; Giorgi, G. L.; Soriano, M. C.; Zambrini, R.. Squeezing as a resource for time series processing in quantum reservoir computing. *Optics Express*. 32, pp. 6733 - 6747. 02/2024. Available on-line at: <<https://doi.org/10.1364/OE.507684>>.  
**Type of production:** Scientific paper **Format:** Journal
- 16** Zunino, L.; Soriano, M. C.. Quantifying the diversity of multiple time series with an ordinal symbolic approach. *Physical Review E*. 108, pp. 065302. 12/2023. Available on-line at: <<https://doi.org/10.1103/PhysRevE.108.065302>>.  
**Type of production:** Scientific paper **Format:** Journal
- 17** Goldmann, M.; Fischer, I.; Mirasso, C. R.; Soriano, M. C.. Exploiting oscillatory dynamics of delay systems for reservoir computing. *Chaos*. 33, pp. 093139. 09/2023. Available on-line at: <<https://doi.org/10.1063/5.0156494>>.  
**Type of production:** Scientific paper **Format:** Journal
- 18** S. Scardapane; C. Gallicchio; A. Micheli; M. C. Soriano. Guest Editorial: Trends in Reservoir Computing. *Cognitive Computation*. 15, pp. 1407 - 1408. 09/2023. Available on-line at: <<https://doi.org/10.1007/s12559-021-09890-1>>. ISSN 1866-9964  
**Type of production:** Scientific paper **Format:** Journal
- 19** García-Beni, J.; Giorgi, G. L.; Soriano, M. C.; Zambrini, R.. Scalable photonic platform for real-time quantum reservoir computing. *Physical Review Applied*. 20, pp. 014051. 07/2023. Available on-line at: <<https://journals.aps.org/prapplied/abstract/10.1103/PhysRevApplied.20.014051>>.  
**Type of production:** Scientific paper **Format:** Journal
- 20** Jonuzi, T.; Lupo, A.; Soriano, M. C.; Massar, S.; Doménech, J.. Integrated programmable spectral filter for frequency-multiplexed neuromorphic computers. *Optics Express*. 31, pp. 19255 - 19265. 05/2023. Available on-line at: <<https://opg.optica.org/oe/fulltext.cfm?uri=oe-31-12-19255&id=530934>>.  
**Type of production:** Scientific paper **Format:** Journal
- 21** Ortín, S.; Soriano, M.C.; Tetzlaff, C.; Wörgötter, F.; Fischer, I.; Mirasso, C.R.; Argyris, A.. Implementation of input correlation learning with an optoelectronic dendritic unit. *Frontiers in Physics*. 11, pp. 1112295. 03/2023. Available on-line at: <<https://doi.org/10.3389/fphy.2023.1112295>>.  
**Type of production:** Scientific paper **Format:** Journal
- 22** Brunner, D.; Soriano, M. C.; Fan, S.. Neural network learning with photonics and for photonic circuit design. *Nanophotonics*. 12, pp. 773 - 775. 03/2023. Available on-line at: <<https://doi.org/10.1515/nanoph-2023-0123>>.  
**Type of production:** Scientific paper **Format:** Journal
- 23** Mujal, P.; Martínez-Peña, R.; Giorgi, G. L.; Soriano, M. C.; Zambrini, R.. Time-series quantum reservoir computing with weak and projective measurements. *npj Quantum Information*. 9, pp. 16. 02/2023. Available on-line at: <<https://doi.org/10.1038/s41534-023-00682-z>>.  
**Type of production:** Scientific paper **Format:** Journal
- 24** Goldmann, M.; Mirasso, C. R.; Fischer, I.; Soriano, M. C.. Learn one size to infer all: Exploiting translational symmetries in delay-dynamical and spatiotemporal systems using scalable neural networks. *Physical Review E*. 106, pp. 044211. 10/2022. Available on-line at: <<https://link.aps.org/doi/10.1103/PhysRevE.106.044211>>.  
**Type of production:** Scientific paper **Format:** Journal



- 25** J. Nokkala; R. Martínez-Peña; R. Zambrini; M. C. Soriano. High-Performance Reservoir Computing With Fluctuations in Linear Networks. *IEEE Transactions on Neural Networks and Learning Systems*. 33 - 6, pp. 2664 - 2675. 06/2022. Available on-line at: <<https://ieeexplore.ieee.org/document/9525045>>.  
**Type of production:** Scientific paper **Format:** Journal
- 26** B. Vettelschoss; A. Röhm; M. C. Soriano. Information processing capacity of a single-node reservoir computer: An experimental evaluation. *IEEE Transactions on Neural Networks and Learning Systems*. 33 - 6, pp. 2714 - 2725. 06/2022. Available on-line at: <<https://ieeexplore.ieee.org/document/9578941>>.  
**Type of production:** Scientific paper **Format:** Journal
- 27** Ortín, S.; Soriano, M.C.; Fischer, I.; Mirasso, C.R.; Argyris, A.. Optical dendrites for spatio-temporal computing with few-mode fibers. *Optical Materials Express*. 12 - 5, pp. 1907 - 1919. 05/2022. Available on-line at: <<http://opg.optica.org/ome/abstract.cfm?URI=ome-12-5-1907>>.  
**Type of production:** Scientific paper **Format:** Journal
- 28** X. Porte; D. Brunner; I. Fischer; M. C. Soriano. Nonlinear Dynamics of a Single-Mode Semiconductor Laser with Long Delayed Optical Feedback: A Modern Experimental Characterization Approach. *Photonics*. 9 - 1, pp. 47. 2022. Available on-line at: <<https://www.mdpi.com/2304-6732/9/1/47>>. ISSN 2304-6732  
**Type of production:** Scientific paper **Format:** Journal
- 29** D. Brunner; L. Larger; M. C. Soriano. Nonlinear photonic dynamical systems for unconventional computing. *Nonlinear Theory and Its Applications, IEICE*. 13 - 1, pp. 26 - 35. 2022.  
**Type of production:** Scientific paper **Format:** Journal
- 30** G. B. Morales; C. R. Mirasso; M. C. Soriano. Unveiling the role of plasticity rules in reservoir computing. *Neurocomputing*. 461, pp. 705 - 715. 10/2021.  
**Type of production:** Scientific paper **Format:** Journal
- 31** R. Martínez-Peña; G. L. Giorgi; J. Nokkala; M. C. Soriano; R. Zambrini. Dynamical Phase Transitions in Quantum Reservoir Computing. *Physical Review Letters*. 127, pp. 100502. American Physical Society, 08/2021. Available on-line at: <<https://link.aps.org/doi/10.1103/PhysRevLett.127.100502>>.  
**Type of production:** Scientific paper **Format:** Journal
- 32** M. C. Soriano; L. Zunino. Time-Delay Identification Using Multiscale Ordinal Quantifiers. *Entropy*. 23 - 8, pp. 969 - 969. 07/2021. Available on-line at: <<https://www.mdpi.com/1099-4300/23/8/969>>. ISSN 1099-4300  
**Type of production:** Scientific paper **Format:** Journal
- 33** P. Mujal; R. Martínez-Peña; J. Nokkala; J. García-Beni; G. L. Giorgi; M. C. Soriano; R. Zambrini. Opportunities in Quantum Reservoir Computing and Extreme Learning Machines. *Advanced Quantum Technologies*. pp. 2100027. 06/2021.  
**Type of production:** Scientific paper **Format:** Journal
- 34** J. Nokkala; R. Martínez-Peña; G. L. Giorgi; V. Parigi; M. C. Soriano; R. Zambrini. Gaussian states of continuous-variable quantum systems provide universal and versatile reservoir computing. *Communications Physics*. 4, pp. 53. 03/2021. Available on-line at: <<https://doi.org/10.1038/s42005-021-00556-w>>. ISSN 2399-3650  
**Type of production:** Scientific paper **Format:** Journal
- 35** P. Mujal; J. Nokkala; R. Martínez-Peña; G. L. Giorgi; M. C. Soriano; R. Zambrini. Analytical Evidence of Nonlinearity in Qubits and Continuous-Variable Quantum Reservoir Computing. *Journal of Physics: Complexity*. 2 - 4, pp. 045008. 2021. Available on-line at: <<http://iopscience.iop.org/article/10.1088/2632-072X/ac340e>>.  
**Type of production:** Scientific paper **Format:** Journal



- 36** Argyris, A.; Cantero, J.; Galletero, M.; Pereda, E.; Mirasso, C.R.; Fischer, I.; Soriano, M.C.. Comparison of photonic reservoir computing systems for fiber transmission equalization. *IEEE Journal of Selected Topics in Quantum Electronics*. 26, pp. 5100309. 2020. Available on-line at: <<https://doi.org/10.1109/JSTQE.2019.2936947>>.  
**Type of production:** Scientific paper **Format:** Journal
- 37** Alfaras, M.; Soriano, M.C.; Ortín, S.. A Fast Machine Learning Model for ECG-Based Heartbeat Classification and Arrhythmia Detection. *Frontiers in Physics*. 7, pp. 103. 2019. Available on-line at: <<https://doi.org/10.3389/fphy.2019.00103>>.  
**Type of production:** Scientific paper **Format:** Journal
- 38** Garau Estarellas, G.; Giorgi, G. L.; Soriano, M.C.; Zambrini, R.. Machine Learning Applied to Quantum Synchronization-Assisted Probing. *Advanced Quantum Technologies*. pp. 1800085. 2019. Available on-line at: <<http://dx.doi.org/10.1002/qute.201800085>>.  
**Type of production:** Scientific paper **Format:** Journal
- 39** Amil, P.; Soriano, M.C.; Masoller, C.. Machine learning algorithms for predicting the amplitude of chaotic laser pulses. *Chaos*. 29, pp. 113111. 2019. Available on-line at: <<https://aip.scitation.org/doi/full/10.1063/1.5120755>>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Mathematical Physics  
**Impact index in year of publication:** 2.832 **Journal in the top 25%:** Yes  
**Position of publication:** 5 **No. of journals in the cat.:** 55  
**Source of citations:** WOS **Citations:** 18
- 40** Olivares, F.; Zunino, L.; Soriano, M. C.; Pérez, D. G.. Unraveling the decay of the number of unobserved ordinal patterns in noisy chaotic dynamics. *Physical Review E*. 100, pp. 042215. 2019. Available on-line at: <<https://journals.aps.org/pre/abstract/10.1103/PhysRevE.100.042215>>.  
**Type of production:** Scientific paper **Format:** Journal
- 41** Jüngling, T.; Porte, X.; Oliver, N.; Soriano, M. C; Fischer I. A unifying analysis of chaos synchronization and consistency in delay-coupled semiconductor lasers. *IEEE Journal of Selected Topics in Quantum Electronics*. 25 - 6, pp. 1501609. (United States of America): 2019.  
**Type of production:** Scientific paper **Format:** Journal
- 42** Ortín, S.; Soriano, M.C.; Alfaras, M.; Mirasso, C. R.. Automated real-time method for ventricular heartbeat classification. *Computer Methods and Programs in Biomedicine*. 169, pp. 1 - 8. 2019. Available on-line at: <<https://doi.org/10.1016/j.cmpb.2018.11.005>>.  
**Type of production:** Scientific paper **Format:** Journal
- 43** Estébanez, I.; Fischer, I.; Soriano, M.C.. Constructive Role of Noise for High-Quality Replication of Chaotic Attractor Dynamics Using a Hardware-Based Reservoir Computer. *Physical Review Applied*. 12, pp. 034058. 2019. Available on-line at: <<https://doi.org/10.1103/PhysRevApplied.12.034058>>.  
**Type of production:** Scientific paper **Format:** Journal
- 44** Cunillera, A.; Soriano, M.C.; Fischer, I.. Cross-predicting the dynamics of an optically injected single-mode semiconductor laser using reservoir computing. *Chaos*. 29, pp. 113113. 2019. Available on-line at: <<https://aip.scitation.org/doi/full/10.1063/1.5120822>>.  
**Type of production:** Scientific paper **Format:** Journal
- 45** Jüngling, T.; Soriano, M. C; Oliver, N.; Porte, X.; Fischer I. Consistency properties of chaotic systems driven by time-delayed feedback. *Physical Review E*. 97 - 4, pp. 042202. (United States of America): American Physical Society, 2018. ISSN 1539-3755  
**Type of production:** Scientific paper **Format:** Journal



**Impact source:** ISI

**Impact index in year of publication:** 2.353

**Position of publication:** 7

**Source of citations:** WOS

**Category:** Science Edition - PHYSICS, MATHEMATICAL

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 55

**Citations:** 4

- 46** Morán, A.; Soriano, M.C.. Improving the quality of a collective signal in a consumer EEG headset. Plos One. 13 - 5, pp. e0197597. 2018. Available on-line at: <<https://doi.org/10.1371/journal.pone.0197597>>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 2.776

**Position of publication:** 24

**Format:** Journal

**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES

**Journal in the top 25%:** No

**No. of journals in the cat.:** 69

- 47** Van der Sande, G.; Brunner, D.; Soriano, M.C.. Advances in photonic reservoir computing. Nanophotonics. 6 - 3, pp. 561 - 576. 2017. Available on-line at: <<https://www.degruyter.com/view/j/nanoph.2017.6.issue-3/nanoph-2016-0132/nanoph-2016-0132.xml?format=INT>>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 6.014

**Position of publication:** 8

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - OPTICS

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 94

**Citations:** 40

- 48** Keuninckx, L.; Soriano, M.C.; Fischer, I.; Mirasso, C. R.; Nguimdo, R. M.; Van der Sande, G.. Encryption key distribution via chaos synchronization. Scientific Reports. 7, pp. 43428. 2017. Available on-line at: <<http://www.nature.com/articles/srep43428>>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 4.122

**Position of publication:** 12

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 64

**Citations:** 14

- 49** Hicke, K.; Brunner, D.; Soriano, M.C.; Fischer, I.. Role of dynamical injection locking and characteristic pulse events for low frequency fluctuations in semiconductor lasers. Chaos. 27 - 11, pp. 114307. 2017. Available on-line at: <<http://dx.doi.org/10.1063/1.5006945>>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 2.415

**Position of publication:** 17

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - MATHEMATICS, APPLIED

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 252

**Citations:** 2

- 50** Soriano, M.C.; Niso, G.; Clements, J.; Ortín, S.; Carrasco, S.; Gudín, M.; Mirasso, C. R.; Pereda, E.. Automated Detection of Epileptic Biomarkers in Resting-State Interictal MEG Data. Frontiers in Neuroinformatics. 11, pp. 43. 2017. Available on-line at: <<http://journal.frontiersin.org/article/10.3389/fninf.2017.00043>>.

**Type of production:** Scientific paper

**Impact source:** ISI

**Format:** Journal



**Impact index in year of publication:** 3.074

**Position of publication:** 8

**Source of citations:** WOS

**Category:** Science Edition - MATHEMATICAL & COMPUTATIONAL BIOLOGY

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 59

**Citations:** 5

- 51** Bueno, J.; Brunner, D.; Soriano, M.C.; Fischer, I.. Conditions for reservoir computing performance using semiconductor lasers with delayed optical feedback. *Optics Express*. 25 - 3, pp. 2401 - 2412. 2017. Available on-line at: <<https://www.osapublishing.org/oe/abstract.cfm?uri=oe-25-3-2401>>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 3.356

**Journal in the top 25%:** Yes

**Position of publication:** 19

**No. of journals in the cat.:** 94

**Source of citations:** WOS

**Citations:** 68

- 52** Porte, X.; Soriano, M.C.; Brunner, D.; Fischer, I.. Bidirectional private key exchange using delay-coupled semiconductor lasers. *Optics Letters*. 41, pp. 2871 - 2874. 2016. Available on-line at: <<https://www.osapublishing.org/ol/abstract.cfm?uri=ol-41-12-2871>>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 3.416

**Journal in the top 25%:** Yes

**Position of publication:** 14

**No. of journals in the cat.:** 92

**Source of citations:** WOS

**Citations:** 13

- 53** Ortin, S; Soriano, M. C.; Pesquera, L.; Brunner, D.; San-Martin, D.; Fischer, I.; Mirasso, C. R.; Gutierrez, J. M. A unified framework for reservoir computing and extreme learning machines based on a single time-delayed neuron. *Scientific Reports*. 5, pp. 14945. 2015.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES

**Impact index in year of publication:** 5.23

**Journal in the top 25%:** Yes

**Position of publication:** 7

**No. of journals in the cat.:** 63

**Source of citations:** WOS

**Citations:** 72

- 54** Gómez-Herrero, G.; Wu, W.; Rutanen, K.; Soriano, M. C.; Pipa, G.; Vicente, R. Assessing coupling dynamics from an ensemble of time series. *Entropy*. 17, pp. 1958 - 1970. (Switzerland): 2015. Available on-line at: <<http://www.mdpi.com/1099-4300/17/4/1958>>. ISSN 1099-4300

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - PHYSICS, MULTIDISCIPLINARY

**Impact index in year of publication:** 1.74

**Journal in the top 25%:** No

**Position of publication:** 25

**No. of journals in the cat.:** 79

**Source of citations:** WOS

**Citations:** 23

- 55** Jüngling, T.; Soriano, M.C.; Fischer I. Determining the sub-Lyapunov exponent of delay systems from time series. *Physical Review E*. 91 - 6, pp. 062908. (United States of America): American Physical Society, 2015. ISSN 1539-3755

**Type of production:** Scientific paper

**Format:** Journal





**Impact source:** ISI

**Impact index in year of publication:** 2.25

**Position of publication:** 6

**Source of citations:** WOS

**Category:** Science Edition - PHYSICS, MATHEMATICAL

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 53

**Citations:** 9

- 56** Alomar, M. L.; Soriano, M.C.; Escalona-Moran, M.; Canals, V.; Fischer, I.; Mirasso, C.; Rossello J. L. Digital implementation of a single dynamical node reservoir computer. IEEE Transactions On Circuits And Systems II-Express Briefs. 62 - 10, pp. 977 - 981. (United States of America): 2015. Available on-line at: <<http://ieeexplore.ieee.org/xpl/abstractKeywords.jsp?arnumber=7161321&tag=1>>. ISSN 1549-7747

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 1.14

**Position of publication:** 141

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC

**Journal in the top 25%:** No

**No. of journals in the cat.:** 255

**Citations:** 7

- 57** Martínez-Llinàs, J.; Porte, X.; Soriano, M.C.; Colet, P.; Fischer, I. Dynamical properties induced by state-dependent delays in photonic systems. Nature Communications. 6, pp. 7425. (United Kingdom): 2015. Available on-line at: <[10.1038/ncomms8425](https://doi.org/10.1038/ncomms8425)>. ISSN 2041-1723

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 11.33

**Position of publication:** 3

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 63

**Citations:** 6

- 58** Escalona-Moran, M.; Soriano, M.C.; Fischer, I.; Mirasso, C. R. Electrocardiogram classification using reservoir computing with logistic regression. IEEE Journal Of Biomedical And Health Informatics. 19 - 3, pp. 892 - 898. (United States of America): 2015. Available on-line at: <[10.1109/JBHI.2014.2332001](https://doi.org/10.1109/JBHI.2014.2332001)>. ISSN 2168-2194

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 2.1

**Position of publication:** 29

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - COMPUTER SCIENCE, INFORMATION SYSTEMS

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 143

**Citations:** 35

- 59** Soriano, M. C.; Brunner, D.; Escalona-Moran, M. A.; Mirasso, C. R.; Fischer, I. Minimal approach to neuro-inspired information processing. Frontiers In Computational Neuroscience. 9, pp. 68. (Switzerland): 2015. Available on-line at: <<http://journal.frontiersin.org/article/10.3389/fncom.2015.00068/abstract>>. ISSN 1662-5188

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 2.65

**Position of publication:** 7

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - MATHEMATICAL & COMPUTATIONAL BIOLOGY

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 56

**Citations:** 25



- 60** Hermans, M.; Soriano, M. C.; Dambre, J.; Bienstman, P.; Fischer, I. Photonic delay systems as machine learning implementations. *Journal of Machine Learning Research*. 16, pp. 2081 - 2097. 2015.  
**Type of production:** Scientific paper  
**Impact source:** ISI  
**Impact index in year of publication:** 2.45  
**Position of publication:** 29  
**Source of citations:** WOS  
**Format:** Journal  
**Category:** Science Edition - COMPUTER SCIENCE, ARTIFICIAL INTELLIGENCE  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 130  
**Citations:** 19
- 61** Haynes, N. D.; Soriano, M. C.; Rosin, D. P.; Fischer, I.; Gauthier, D. J. Reservoir computing with a single time-delay autonomous boolean node. *Physical Review E*. 91, pp. 020801. (United States of America): American Physical Society, 2015. Available on-line at: <10.1103/PhysRevE.91.020801>. ISSN 1539-3755  
**Type of production:** Scientific paper  
**Impact source:** ISI  
**Impact index in year of publication:** 2.25  
**Position of publication:** 6  
**Source of citations:** WOS  
**Format:** Journal  
**Category:** Science Edition - PHYSICS, MATHEMATICAL  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 53  
**Citations:** 54
- 62** Brunner, D.; Soriano, M.C.; Porte, X.; Fischer, I. Experimental phase-space tomography of semiconductor laser dynamics. *Physical Review Letters*. 115, pp. 053901. (United States of America): 2015. Available on-line at: <10.1103/PhysRevLett.115.053901>. ISSN 0031-9007  
**Type of production:** Scientific paper  
**Impact source:** ISI  
**Impact index in year of publication:** 7.645  
**Position of publication:** 6  
**Source of citations:** WOS  
**Relevant publication:** No  
**Format:** Journal  
**Category:** Science Edition - PHYSICS, MULTIDISCIPLINARY  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 79  
**Citations:** 17
- 63** Porte, X; D'Huys, O.; Jüngling, T.; Brunner, D.; Soriano, M. C.. Autocorrelation properties of chaotic delay dynamical systems: A study on semiconductor lasers. *Physical Review E*. 90, pp. 052911. 2014.  
**Type of production:** Scientific paper  
**Impact source:** ISI  
**Impact index in year of publication:** 2.288  
**Position of publication:** 5  
**Source of citations:** WOS  
**Format:** Journal  
**Category:** Science Edition - PHYSICS, MATHEMATICAL  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 54  
**Citations:** 13
- 64** Escalona-Moran, M.; Soriano, M. C.; Garcia-Prieto, J.; Fischer, I; Mirasso, C. R.. Multivariate nonlinear time-series estimation using delay-based reservoir computing. *European Physical Journal-Special Topics*. 223 - 13, pp. 2903 - 2912. 2014.  
**Type of production:** Scientific paper  
**Impact source:** ISI  
**Impact index in year of publication:** 1.399  
**Position of publication:** 37  
**Format:** Journal  
**Category:** Science Edition - PHYSICS, MULTIDISCIPLINARY  
**Journal in the top 25%:** No  
**No. of journals in the cat.:** 78



**Source of citations:** WOS

**Citations:** 2

- 65** Porte, X.; Soriano, M. C.; Fischer, I. Similarity properties in the dynamics of delayed-feedback semiconductor lasers. *Physical Review A*. 89, pp. 023822. 2014.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 2.808

**Journal in the top 25%:** Yes

**Position of publication:** 16

**No. of journals in the cat.:** 87

**Source of citations:** WOS

**Citations:** 23

- 66** Oliver, N.; Soriano, M.C.; Sukow, D.W.; Fischer, I. Fast random bit generation using a chaotic laser: approaching the information theoretic limit. *IEEE Journal of Quantum Electronics*. 49 - 11, pp. 910 - 918. 2013. Available on-line at: <10.1109/JQE.2013.2280917>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC

**Impact index in year of publication:** 2.11

**Journal in the top 25%:** Yes

**Position of publication:** 56

**No. of journals in the cat.:** 248

**Source of citations:** WOS

**Citations:** 63

- 67** Brunner, D.; Soriano, M. C.; Fischer, I. High-Speed Optical Vector and Matrix Operations Using a Semiconductor Laser. *IEEE Photonics Technology Letters*. 25 - 17, pp. 1680. 2013. Available on-line at: <http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6558807>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 2.18

**Journal in the top 25%:** Yes

**Position of publication:** 20

**No. of journals in the cat.:** 83

**Source of citations:** WOS

**Citations:** 12

- 68** Hicke, K.; Escalona, M.; Brunner, D.; Soriano, M.C.; Fischer, I.; Mirasso, C. R. Information Processing using transient Dynamics of semiconductor lasers subject to delayed feedback. *IEEE Journal of Selected Topics in Quantum Electronics*. 19 - 4, pp. 1501610. 2013. Available on-line at: <10.1109/JSTQE.2013.2241738>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 3.46

**Journal in the top 25%:** Yes

**Position of publication:** 8

**No. of journals in the cat.:** 83

**Source of citations:** WOS

**Citations:** 48

- 69** Kato, H.; Soriano, M. C.; Pereda, E.; Fischer, I.; Mirasso, C. R. Limits to detection of generalized synchronization in delay-coupled chaotic oscillators. *Physical Review E*. 88, pp. 062924. 2013. Available on-line at: <10.1103/PhysRevE.88.062924>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - PHYSICS, MATHEMATICAL

**Impact index in year of publication:** 2.33

**Journal in the top 25%:** Yes

**Position of publication:** 6

**No. of journals in the cat.:** 55

**Source of citations:** WOS

**Citations:** 3



- 70** Mashal, L.; Nguimdo, R. M.; Van der Sande, G.; Soriano, M. C.; Danckaert, J.; Verschaffelt, G. Low-Frequency Fluctuations in Semiconductor Ring Lasers With Optical Feedback. *IEEE Journal of Quantum Electronics*. 49 - 9, pp. 790 - 797. 2013. Available on-line at: <10.1109/JQE.2013.2272477>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC  
**Impact index in year of publication:** 2.11 **Journal in the top 25%:** Yes  
**Position of publication:** 56 **No. of journals in the cat.:** 248  
**Source of citations:** WOS **Citations:** 16
- 71** Soriano, M.C.; Ortin, S.; Brunner, D.; Larger, L.; Mirasso, C.R.; Fischer, I.; Pesquera, L. Optoelectronic reservoir computing: tackling noise-induced performance degradation. *Optics Express*. 21 - 1, pp. 12 - 20. 2013. Available on-line at: <10.1364/OE.21.000012>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - OPTICS  
**Impact index in year of publication:** 3.52 **Journal in the top 25%:** Yes  
**Position of publication:** 6 **No. of journals in the cat.:** 83  
**Source of citations:** WOS **Citations:** 91
- 72** Soriano, M. C.; Flunkert, V.; Fischer, I. Relation between delayed feedback and delay-coupled systems and its application to chaotic lasers. *Chaos*. 23, pp. 043133. 2013. Available on-line at: <10.1063/1.4844335>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - MATHEMATICS, APPLIED  
**Impact index in year of publication:** 1.76 **Journal in the top 25%:** Yes  
**Position of publication:** 25 **No. of journals in the cat.:** 251  
**Source of citations:** WOS **Citations:** 8
- 73** Arroyo-Almanza, D. A.; Pisarchik, A. N.; Fischer, I.; Mirasso, C. R.; Soriano, M. C. Spectral properties and synchronization scenarios of two mutually delay-coupled semiconductor lasers. *Optics Communications*. 301-302, pp. 67 - 73. 2013. Available on-line at: <http://dx.doi.org/10.1016/j.optcom.2013.03.040>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - OPTICS  
**Impact index in year of publication:** 1.54 **Journal in the top 25%:** No  
**Position of publication:** 34 **No. of journals in the cat.:** 83  
**Source of citations:** WOS **Citations:** 13
- 74** Heiligenthal, S.; Jüngling, T.; D'Huys, O.; Arroyo-Almanza, D. A.; Soriano, M. C.; Fischer, I.; Kanter, I.; Kinzel, W. Strong and weak chaos in networks of semiconductor lasers with time-delayed couplings. *Physical Review E*. 88, pp. 012902. 2013. Available on-line at: <10.1103/PhysRevE.88.012902>.  
**Type of production:** Scientific paper **Format:** Journal  
**Impact source:** ISI **Category:** Science Edition - PHYSICS, MATHEMATICAL  
**Impact index in year of publication:** 2.33 **Journal in the top 25%:** Yes  
**Position of publication:** 6 **No. of journals in the cat.:** 55  
**Source of citations:** WOS **Citations:** 36



- 75** Zunino, L.; Soriano, M.C.; Rosso, O.A. Distinguishing chaotic and stochastic dynamics from time series by using a multiscale symbolic approach. *Physical Review E*. 86, pp. 046210. 2012. Available on-line at: <<http://pre.aps.org/abstract/PRE/v86/i4/e046210>>.
- Type of production:** Scientific paper  
**Impact source:** ISI
- Impact index in year of publication:** 2.313  
**Position of publication:** 6  
**Source of citations:** WOS
- Format:** Journal  
**Category:** Science Edition - PHYSICS, MATHEMATICAL  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 55  
**Citations:** 102
- 76** Brunner, D.; Porte, X.; Soriano, M.C.; Fischer, I. Real-time frequency dynamics and high-resolution spectra of a semiconductor laser with delayed feedback. *Scientific Reports*. 2, pp. 732. Nature Publishing Group, 2012. Available on-line at: <<http://www.nature.com/srep/2012/121012/srep00732/full/srep00732.html>>.
- Type of production:** Scientific paper  
**Impact source:** ISI
- Impact index in year of publication:** 2,93  
**Position of publication:** 8  
**Source of citations:** WOS
- Format:** Journal  
**Category:** Science Edition - MULTIDISCIPLINARY SCIENCES  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 56  
**Citations:** 23
- 77** Tiana-Alsina, J.; Hicke, K.; Porte, X.; Soriano, M.C.; Torrent, M.C.; Garcia-Ojalvo, J.; Fischer, I. Zero-lag synchronization and bubbling in delay-coupled lasers. *Physical Review E*. 83, pp. 026209. 2012. Available on-line at: <<http://pre.aps.org/abstract/PRE/v85/i2/e026209>>.
- Type of production:** Scientific paper  
**Impact source:** ISI
- Impact index in year of publication:** 2.313  
**Position of publication:** 6  
**Source of citations:** WOS
- Format:** Journal  
**Category:** Science Edition - PHYSICS, MATHEMATICAL  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 55  
**Citations:** 24
- 78** Zunino, L.; Rosso, O.A.; Soriano, M.C. Characterizing the Hyperchaotic Dynamics of a Semiconductor Laser Subject to Optical Feedback Via Permutation Entropy. *IEEE Journal of Selected Topics in Quantum Electronics*. 17, pp. 1250 - 1257. 2011.
- Type of production:** Scientific paper  
**Impact source:** ISI
- Impact index in year of publication:** 3.780  
**Position of publication:** 4  
**Source of citations:** WOS
- Format:** Journal  
**Category:** Science Edition - OPTICS  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 79  
**Citations:** 46
- 79** Soriano, M.C.; Zunino, L.; Larger, L.; Fischer, I.; Mirasso, C.R. Distinguishing fingerprints of hyperchaotic and stochastic dynamics in optical chaos from a delayed opto-electronic oscillator. *Optics Letters*. 36, pp. 2212 - 2214. 2011. Available on-line at: <<http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-36-12-2212>>.
- Type of production:** Scientific paper  
**Impact source:** ISI
- Impact index in year of publication:** 3.399  
**Position of publication:** 7
- Format:** Journal  
**Category:** Science Edition - OPTICS  
**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 79

**Source of citations:** WOS

**Citations:** 21

- 80** Oliver, N.; Soriano, M.C.; Sukow, D.W.; Fischer, I.. Dynamics of a semiconductor laser with polarization rotated feedback and its utilization for random bit generation. *Optics Letters*. 36, pp. 4632 - 4634. 2011. Available on-line at: <<http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-36-23-4632>>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 3.399

**Journal in the top 25%:** Yes

**Position of publication:** 7

**No. of journals in the cat.:** 79

**Source of citations:** WOS

**Citations:** 64

- 81** Soriano, M.C.; Berkvens, T.; Van der Sande, G.; Verschaffelt, G.; Danckaert, J.; Fischer, I. Interplay of current noise and delayed optical feedback on the dynamics of semiconductor lasers. *IEEE Journal of Quantum Electronics*. 47, pp. 368 - 374. 2011. Available on-line at: <<http://dx.doi.org/10.1109/JQE.2010.2090511>>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC

**Impact index in year of publication:** 1.879

**Journal in the top 25%:** Yes

**Position of publication:** 54

**No. of journals in the cat.:** 245

**Source of citations:** WOS

**Citations:** 11

- 82** Modeste Nguimdo, M.; Soriano, M.C.; Colet, P. Role of the phase in the identification of delay time in semiconductor lasers with optical feedback. *Optics Letters*. 36, pp. 4332 - 4334. 2011. Available on-line at: <<http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-36-22-4332>>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - OPTICS

**Impact index in year of publication:** 3.399

**Journal in the top 25%:** Yes

**Position of publication:** 7

**No. of journals in the cat.:** 79

**Source of citations:** WOS

**Citations:** 52

- 83** Jacobo, A.; Soriano, M.C.; Mirasso, C.R.; Colet, P. Chaos-Based Optical Communications: Encryption Versus Nonlinear Filtering. *IEEE Journal of Quantum Electronics*. 46, pp. 499 - 505. 2010. Available on-line at: <[http://ieeexplore.ieee.org/xpls/abs\\_all.jsp?arnumber=5415800&tag=1](http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5415800&tag=1)>.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC

**Impact index in year of publication:** 2,48

**Journal in the top 25%:** Yes

**Position of publication:** 28

**No. of journals in the cat.:** 247

**Source of citations:** WOS

**Citations:** 11

- 84** Zunino, L.; Soriano, M. C.; Fischer, I.; Rosso, O. A.; Mirasso, C. R. Permutation information theory approach to unveil delay dynamics from time series analysis. *Physical Review E*. 82, pp. 046212. 2010.

**Type of production:** Scientific paper

**Format:** Journal

**Impact source:** ISI

**Category:** Science Edition - PHYSICS, MATHEMATICAL

**Impact index in year of publication:** 2,352

**Journal in the top 25%:** Yes

**Position of publication:** 4

**No. of journals in the cat.:** 54

**Source of citations:** WOS**Citations:** 122

- 85** Ruiz-Oliveras, F.; Soriano, M.C.; Colet, P.; Mirasso, C.R. Information Encoding and Decoding Using Unidirectionally Coupled Chaotic Semiconductor Lasers Subject to Filtered Optical Feedback. *IEEE Journal of Quantum Electronics*. 45, pp. 972 - 978. 2009. Available on-line at: <<http://ieeexplore.ieee.org/search/wrapper.jsp?arnumber=5153580>>.

**Type of production:** Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Science Edition - ENGINEERING, ELECTRICAL & ELECTRONIC**Impact index in year of publication:** 1,968**Journal in the top 25%:** Yes**Position of publication:** 44**No. of journals in the cat.:** 246**Source of citations:** WOS**Citations:** 8

- 86** Zunino, L.; Soriano, M.C.; Figliola, A.; Perez, D.G.; Garavaglia, M.; Mirasso, C.R.; Rosso, O.A. Performance of encryption schemes in chaotic optical communication: A multifractal approach. *Optics Communications*. 282, pp. 4587 - 4594. 2009. Available on-line at: <<http://dx.doi.org/10.1016/j.optcom.2009.08.047>>.

**Type of production:** Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Science Edition - OPTICS**Impact index in year of publication:** 1,316**Journal in the top 25%:** No**Position of publication:** 23**No. of journals in the cat.:** 64**Source of citations:** WOS**Citations:** 9

- 87** Soriano, M.C.; Colet, P.; Mirasso, C.R. Security Implications of Open- and Closed-Loop Receivers in All-Optical Chaos-Based Communications. *IEEE Photonics Technology Letters*. 21, pp. 426 - 428. 2009. Available on-line at: <<http://ieeexplore.ieee.org/search/wrapper.jsp?arnumber=4773175>>.

**Type of production:** Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Science Edition - OPTICS**Impact index in year of publication:** 1,815**Journal in the top 25%:** Yes**Position of publication:** 18**No. of journals in the cat.:** 71**Source of citations:** WOS**Citations:** 48**Relevant publication:** No

- 88** Guy Van der Sande; Miguel C. Soriano; Ingo Fischer; Claudio R. Mirasso. Dynamics, correlation scaling, and synchronization behavior in rings of delay-coupled oscillators. *Physical Review E*. 77, pp. 055202. 2008. Available on-line at: <<http://link.aps.org/doi/10.1103/PhysRevE.77.055202>>.

**Type of production:** Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Science Edition - PHYSICS, MATHEMATICAL**Impact index in year of publication:** 2,508**Journal in the top 25%:** Yes**Position of publication:** 6**No. of journals in the cat.:** 46**Source of citations:** WOS**Citations:** 62

- 89** Soriano, M.C.; Ruiz-Oliveras, F.; Colet, P.; Mirasso, C.R. Synchronization properties of coupled semiconductor lasers subject to filtered optical feedback. *Physical Review E*. 78, pp. 046218. 2008. Available on-line at: <<http://link.aps.org/doi/10.1103/PhysRevE.78.046218>>.

**Type of production:** Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Science Edition - PHYSICS, MATHEMATICAL





**Impact index in year of publication:** 2,508  
**Position of publication:** 6

**Source of citations:** WOS

**Journal in the top 25%:** Yes  
**No. of journals in the cat.:** 46

**Citations:** 30

- 90** G. Van der Sande; M. C. Soriano; M. Yousefi; M. Peeters; J. Danckaert; G. Verschaffelt; D. Lenstra. Influence of current noise on the relaxation oscillation dynamics of semiconductor lasers. Applied Physics Letters. 88, pp. 071107. 2006.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 3,977

**Position of publication:** 6

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - PHYSICS, APPLIED

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 84

**Citations:** 7

- 91** J. Albert; M. C. Soriano; I. Veretennicoff; K. Panajotov; J. Danckaert; P. A. Porta; D. P. Curtin; J. G. McInerney. Laser Doppler velocimetry with polarization-bistable VCSELS. IEEE Journal of Selected Topics in Quantum Electronics. 10, pp. 1006 - 1012. 2004.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 3,048

**Position of publication:** 9

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - OPTICS

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 64

**Citations:** 10

- 92** M. C. Soriano; M. Yousefi; J. Danckaert; S. Barland; M. Romanelli; G. Giacomelli; F. Marin. Low-frequency fluctuations in vertical-cavity surface-emitting lasers with polarization selective feedback: Experiment and theory. IEEE Journal of Selected Topics in Quantum Electronics. 10, pp. 998 - 1005. 2004.

**Type of production:** Scientific paper

**Impact source:** ISI

**Impact index in year of publication:** 3,048

**Position of publication:** 9

**Source of citations:** WOS

**Format:** Journal

**Category:** Science Edition - OPTICS

**Journal in the top 25%:** Yes

**No. of journals in the cat.:** 64

**Citations:** 11

- 93** Soriano, M. C.; Aizpurua, J.. Advanced Photonics. CSIC 'white books' on Strategic Topics and challenges, Theme 10: Digital and complex information. pp. 36 - 55. Editorial CSIC, 2021.

**Type of production:** Book chapter

- 94** Van der Sande, G.; Soriano, M. C.. Semiconductor lasers as reservoir substrates. Photonic Reservoir Computing: Optical Recurrent Neural Networks. pp. 185 - 204. (Germany): De Gruyter, 2019. ISBN 978-3-11-058349-6

**Type of production:** Book chapter

**Format:** Book

- 95** Ortín, S.; Pesquera, L.; Van der Sande, G.; Soriano, M. C.. Time delay systems for reservoir computing. Photonic Reservoir Computing: Optical Recurrent Neural Networks. pp. 117 - 152. (Germany): De Gruyter, 2019. ISBN 978-3-11-058349-6

**Type of production:** Book chapter

**Format:** Book

- 96** C. M. Gonzalez; M. C. Soriano; M. C. Torrent; J. Garcia-Ojalvo; I. Fischer. Dynamical and Synchronization Properties of Delay-Coupled Lasers. Nonlinear Laser Dynamics: From Quantum Dots to Cryptography; Kathy Lüdge (Editor), Heinz Georg Schuster (Series Editor). pp. 217 - 244. (Germany): Wiley-Vch, 2011. ISBN 978-3-527-41100-9

**Type of production:** Book chapter

**Format:** Book



## Works submitted to national or international conferences

- 1** **Title of the work:** Minimalist Reservoir Computing: Implementation, Dynamics, and Future Directions  
**Name of the conference:** Dynamics Days Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** Bremen, Germany  
**Date of event:** 29/07/2024  
**End date:** 02/08/2024  
Soriano, M. C.
- 2** **Title of the work:** Unconventional Computing with Photonic Substrates  
**Name of the conference:** Unconventional Computing Workshop  
**Type of event:** Workshop  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Erice, Italy  
**Date of event:** 06/07/2024  
**End date:** 12/07/2024  
Soriano, M. C.
- 3** **Title of the work:** Photonic Quantum Reservoir Computing: Role of Squeezing  
**Name of the conference:** XIV Reunión Nacional de Óptica (RNO)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Murcia, Spain  
**Date of event:** 03/07/2024  
**End date:** 05/07/2024  
Garcia-Beni, J.; Giorgi, G. L.; Soriano, M. C.; Zambrini, R.
- 4** **Title of the work:** Reservoir computing for the prediction of semiconductor laser dynamics  
**Name of the conference:** SPIE Photonics Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Strasbourg, France  
**Date of event:** 07/04/2024  
**End date:** 11/04/2024  
Goldmann, M.; Cunillera, A.; Mirasso, C. R.; Fischer, I.; Soriano, M. C.
- 5** **Title of the work:** Ultrafast Information Processing with Delay-Coupled Semiconductor Lasers  
**Name of the conference:** International Symposium on Physics and Applications of Laser Dynamics 2023 (IS-PALD 2023)  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** Metz, France





**Date of event:** 28/11/2023  
**End date:** 02/12/2023  
Goldmann, M.; Soriano, M. C.

**6** **Title of the work:** Physical implementation of a deep recurrent neural network folded in time  
**Name of the conference:** Neuromorphic, Natural and Physical Computing: Interdisciplinary Foundations (NNPC 2023)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Hannover, Germany  
**Date of event:** 24/10/2023  
**End date:** 28/10/2023  
Gallicchio, C.; Soriano, M. C.

**7** **Title of the work:** Time-multiplexed photonic systems for information processing  
**Name of the conference:** Artificial Intelligence Photonics 2023  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** San Sebastian, Spain  
**Date of event:** 10/09/2023  
**End date:** 14/09/2023  
Soriano, M. C.

**8** **Title of the work:** Photonic reservoir computing using time-multiplexed systems with classical and quantum resources  
**Name of the conference:** Neuromorphic Photonics  
**Type of event:** Workshop  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** Athens, Greece  
**Date of event:** 13/07/2023  
**End date:** 14/07/2023  
Soriano, M. C.

**9** **Title of the work:** Dendritic-like computation using single- and multi-mode optical fibres  
**Name of the conference:** Rank Symposium on Neuromorphic Photonics  
**Type of event:** Workshop  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** Grasmere, United Kingdom  
**Date of event:** 06/02/2023  
**End date:** 09/02/2023  
Soriano, M. C.

**10** **Title of the work:** Inferring untrained dynamics of complex systems using adapted recurrent neural networks  
**Name of the conference:** Dynamics Days Europe 2022  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk



**Corresponding author:** Yes

**City of event:** Aberdeen, North Eastern Scotland, United Kingdom

**Date of event:** 22/08/2022

**End date:** 26/08/2022

**Organising entity:** Universidad de Aberdeen

Goldmann, M.; Mirasso, C. R.; Fischer, I.; Soriano, M. C.

- 11 Title of the work:** Dendritic-like computation using multimode optical fibers  
**Name of the conference:** 5th International Conference on Applications of Optics and Photonics (AOP2022)  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**Corresponding author:** Yes  
**City of event:** Guimaraes, Portugal  
**Date of event:** 18/07/2022  
**End date:** 22/07/2022  
Ortin, S.; Soriano, M. C.; Fischer, I.; Mirasso, C. R.; Argyris, A.
- 12 Title of the work:** Photonic reservoir computing using quantum resources  
**Name of the conference:** XXXVIII Biennial of Physics of the Spanish Royal Physics Society  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Murcia, Region of Murcia, Spain  
**Date of event:** 11/07/2022  
**End date:** 15/07/2022  
Garcia-Beni, J.; Giorgi, G. L.; Soriano, M. C.; Zambrini, R.
- 13 Title of the work:** Dynamical Phase Transitions in Quantum Reservoir Computing  
**Name of the conference:** Conference on Complex Systems CCS 2021  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Lyon, France  
**Date of event:** 25/10/2021  
**End date:** 29/10/2021  
Giorgi, G. L.; Nokkala, J.; Soriano, M. C.; Zambrini, R.
- 14 Title of the work:** Analog information processing with time-multiplexed optoelectronic systems  
**Name of the conference:** Emerging Topics in Artificial Intelligence (ETAI)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** San Diego (online), United States of America  
**Date of event:** 01/08/2021  
**End date:** 05/08/2021  
Goldmann, M.; Fischer, I.; Soriano, M. C.
- 15 Title of the work:** Exploiting transient dynamics of a time-multiplexed reservoir to boost the system performance  
**Name of the conference:** International Joint Conference on Neural Networks (IJCNN)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Shenzhen (online), China



**Date of event:** 18/07/2021

**End date:** 22/07/2021

Goldmann, M.; Mirasso, C. R.; Fischer, I.; Soriano, M. C.

- 16** **Title of the work:** Optoelectronic reservoir computing using a mixed digital-analog hardware implementation  
**Name of the conference:** 28th International Conference on Artificial Neural Networks (ICANN 2019)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**Corresponding author:** Yes  
**City of event:** Munich, Germany  
**Date of event:** 2019  
**With external admission assessment committee:** Yes  
Soriano, M. C.; Massuti-Ballester, P.; Yelo, J.; Fischer, I. En: Tetko I., Kůrková V., Karpov P., Theis F. (eds) Artificial Neural Networks and Machine Learning – ICANN 2019: Workshop and Special Sessions. ICANN 2019. Lecture Notes in Computer Science, vol 11731. Springer. Available on-line at: <[https://doi.org/10.1007/978-3-030-30493-5\\_18](https://doi.org/10.1007/978-3-030-30493-5_18)>.
- 17** **Title of the work:** Delay-based Photonic Reservoir Computing  
**Name of the conference:** ERC International Workshop "Photonic Reservoir Computing and Information Processing in Complex Networks"  
**Type of event:** Workshop  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Trento, Provincia Autonoma Trento, Italy  
**Date of event:** 2019  
Soriano, M. C.
- 18** **Title of the work:** Reservoir Computing for the inference of unobserved variables in chaotic systems  
**Name of the conference:** Workshop Ibersinc3 2019  
**Type of event:** Workshop  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** La Laguna, Spain  
**Date of event:** 2019  
A. Cunillera; Fischer, I.; Soriano, M. C.
- 19** **Title of the work:** Autonomous operation of echo state networks  
**Name of the conference:** 2018 International Symposium on Nonlinear Theory and Its Applications (NOLTA2018)  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Tarragona, Spain  
**Date of event:** 2018  
Soriano, M. C.; Fischer, I.
- 20** **Title of the work:** Information processing by complex systems: the case of a single nonlinear node with delay  
**Name of the conference:** 15th Experimental Chaos and Complexity Conference  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Madrid, Spain  
**Date of event:** 2018  
Soriano, M. C.; Fischer, I.



- 21** **Title of the work:** Recent advances in photonic reservoir computers  
**Name of the conference:** International Symposium on Physics and Applications of Laser Dynamics  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Hong Kong, Hong Kong  
**Date of event:** 2018  
Soriano, M. C.
- 22** **Title of the work:** On the use of functional connectivity patterns to distinguish healthy and epileptic patients from interictal MEG data  
**Name of the conference:** Coupling and Causality in Complex Systems  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Cologne, Germany  
**Date of event:** 2017  
Soriano, M. C.; Pereda, E.
- 23** **Title of the work:** Recent advances in photonic reservoir computers: a brain-inspired computing paradigm  
**Name of the conference:** II Ibersinc Meeting  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Madrid, Spain  
**Date of event:** 2017  
Soriano, M. C.
- 24** **Title of the work:** Dynamics and applications of delay-coupled semiconductor lasers  
**Name of the conference:** International Symposium on Physics and Applications of Laser Dynamics  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Hsinchu, Taiwan  
**Date of event:** 2016  
Soriano, M. C.
- 25** **Title of the work:** Reservoir Computing with Photonic Delay Systems  
**Name of the conference:** XXXVI Dynamics Days Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Corfu, Greece  
**Date of event:** 2016
- 26** **Title of the work:** Consistency and chaos synchronization in delay-coupled semiconductor lasers  
**Name of the conference:** XXXV Dynamics Days Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Exeter, United Kingdom  
**Date of event:** 06/09/2015  
Soriano, M. C.



- 27** **Title of the work:** External-cavity semiconductor laser with state-dependent delay  
**Name of the conference:** CLEO Europe EQEC 2015  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**Corresponding author:** Yes  
**City of event:** Munich, Germany  
**Date of event:** 2015  
Porte, X.; Martínez-LLinàs, J.; Soriano, M. C.; Colet, P.; Fischer, I.
- 28** **Title of the work:** Scaling Properties of the Dynamics of Semiconductor Lasers in External Cavities  
**Name of the conference:** 2014 International Semiconductor Laser Conference (ISLC)  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Palma de Mallorca, Spain  
**Date of event:** 09/09/2014  
Porte, X.; Soriano, M. C.; Breuer, S.; Drzewietzki, L.; Elsasser, W.; Fischer, I.
- 29** **Title of the work:** Dynamics of delayed-feedback semiconductor lasers revisited: Similarity properties and applications  
**Name of the conference:** WIAS International Workshop on Nonlinear Dynamics in Semiconductor Lasers  
**Type of event:** Workshop  
**Type of participation:** Participatory - oral communication  
**City of event:** Berlin, Germany  
**Date of event:** 12/05/2014  
Fischer, I.; Porte, X.; Soriano, M. C.
- 30** **Title of the work:** Experimental distinction of weak and strong chaos in delay-coupled semiconductor lasers  
**Name of the conference:** CLEO Europe EQEC 2013  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Múnich, Germany  
**Date of event:** 2013  
Soriano, M.C.; Porte, X.; Arroyo-Almanza, D.A.; Mirasso, C.R.; Fischer, I.
- 31** **Title of the work:** Identification of the delay time in semiconductor lasers with optical feedback  
**Name of the conference:** CLEO Europe EQEC 2013  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Múnich, Germany  
**Date of event:** 2013  
Soriano, M. C.; Nguimdo, R. M.; Colet, P.
- 32** **Title of the work:** A Novel Photonics Approach to Unconventional Information Processing  
**Name of the conference:** ECOC 2012 (CLEO Focus 2012 Meeting)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Amsterdam, Holland  
**Date of event:** 2012  
Soriano, M.C.; Brunner, D.; Ortin, S.; Mirasso, C.R.; Larger, L.; Fischer, I.; Pesquera, L.



- 33** **Title of the work:** Delay identification in semiconductor lasers with optical feedback  
**Name of the conference:** XVIII Congreso de Física Estadística FISES'12  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Palma de Mallorca, Spain  
**Date of event:** 2012  
Soriano, M.C.; Modeste Nguimdo, R.; Colet, P.
- 34** **Title of the work:** Synchronization Without Correlation  
**Name of the conference:** 2012 International Symposium on Nonlinear Theory and its Applications (NOLTA 2012)  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Palma de Mallorca, Spain  
**Date of event:** 2012  
Soriano, M.C.; Van der Sande, G.; Fischer I.; Mirasso, C.R.
- 35** **Title of the work:** A Novel Experimental Approach for Information Processing in Photonics  
**Name of the conference:** 2011 International Symposium on Nonlinear Theory and its Applications (NOLTA 2011)  
**Type of event:** Conference  
**Type of participation:** Participatory - invited/keynote talk  
**City of event:** Kobe, Japan  
**Date of event:** 2011  
Soriano, M.C.; Brunner, D.; Appeltant, L.; Mirasso, C.R.; Fischer, I.; Larger, L.
- 36** **Title of the work:** Discriminating Chaotic and Stochastic Dynamics in an Optoelectronic Oscillator with Delayed Feedback  
**Name of the conference:** CLEO Europe EQEC 2011  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Múnich, Germany  
**Date of event:** 2011  
Soriano, M.C.; Zunino, L.; Larger, L.; Fischer, I.; Mirasso, C.R.
- 37** **Title of the work:** Time delay identification using permutation information theory quantifiers  
**Name of the conference:** XVII Congreso de Física Estadística FISES'11  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Barcelona, Spain  
**Date of event:** 2011  
Soriano, M.C.; Zunino, L.; Fischer, I.; Mirasso, C.R.
- 38** **Title of the work:** Delay-coupled semiconductor lasers: dynamics and applications  
**Name of the conference:** VII Reunión Iberoamericana de Óptica (RIA) X Encuentro Latinoamericano de Óptica, Láser y Aplicaciones (OPTILAS)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Lima, Peru  
**Date of event:** 2010





Cornelles Soriano, M.; Oliver, N.; Porte, X.; Vicente, R.; Fischer, I.; Mirasso, C.R. "ABSTRACT BOOK of the RIAO-OPTILAS 2010, page 480, ISBN: 978-612-4057-21-2".

- 39** **Title of the work:** Electro-optic delay dynamics used as a reservoir for Liquid State Computing  
**Name of the conference:** DYCOEC Workshop on Synchronization, control & Bio-dynamics  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Besançon, France  
**Date of event:** 2010  
Larger, L.; Cornelles Soriano, M.; Appeltant, L.; Danckaert, J.; Mirasso, C.R.; Fischer, I.
- 40** **Title of the work:** Quantifying complexity of the chaotic regime of a semiconductor laser subject to feedback via information theory measures  
**Name of the conference:** SPIE Photonics Europe  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Bruselas, Belgium  
**Date of event:** 2010  
Soriano, M.C.; Zunino, L.; Rosso, O.A.; Mirasso, C.R. "Semiconductor Lasers and Laser Dynamics IV. Proceedings of the SPIE., vol. 7720, article nr. 77202G (10 pages)".
- 41** **Title of the work:** Lyapunov analysis of the chaotic dynamics of rings of delay-coupled oscillators  
**Name of the conference:** XVI Congreso de Física Estadística FISES'09  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Huelva, Spain  
**Date of event:** 2009  
Soriano, M.C.; Van der Sande, G.; Fischer, I.; Mirasso, C.R.; Colet, P.
- 42** **Title of the work:** Open vs closed loop receivers in all-optical chaos-based communication systems  
**Name of the conference:** XVI Congreso de Física Estadística FISES'09  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Huelva, Spain  
**Date of event:** 2009  
Soriano, M.C.; Colet, P.; Mirasso, C.
- 43** **Title of the work:** Open vs closed loop receivers in all-optical chaos-based communication systems: message encoding and decoding  
**Name of the conference:** CHAOS 2009 (CATS Workshop)  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Chania, Greece  
**Date of event:** 2009  
Soriano, M.C.; Colet, P.; Mirasso, C.
- 44** **Title of the work:** Open vs closed loop receivers in all-optical chaos-based communication systems: the final round  
**Name of the conference:** CLEO Europe EQEC 2009  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication



**City of event:** Múnich, Germany

**Date of event:** 2009

Soriano, M.C.; Colet, P.; Mirasso, C.

- 45** **Title of the work:** Synchronization without correlation  
**Name of the conference:** 4th International Scientific Conference on Physics and Control - PhysCon2009  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Catania, Italy  
**Date of event:** 2009  
Mirasso, C.R.; Soriano, M.C.; Van der Sande, G.; Fischer, I.
- 46** **Title of the work:** Sincronización de dos láseres de semiconductor sometidos a retroalimentación óptica filtrada y acoplados unidireccionalmente  
**Name of the conference:** XV Congreso de Física Estadística  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Salamanca, Spain  
**Date of event:** 2008  
Cornelles Soriano, M.; Colet, P.; Mirasso, C.
- 47** **Title of the work:** Statistical Complexity Analysis of the Chaotic Response of a Semiconductor Laser subject to Optical Feedback  
**Name of the conference:** CLEO Europe EQEC 2007  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Múnich, Germany  
**Date of event:** 2007  
M. Cornelles Soriano; C. Mirasso; P. Colet; O. A. Rosso.
- 48** **Title of the work:** The influence of current noise on polarization mode hopping in vertical cavity surface emitting lasers  
**Name of the conference:** SPIE Photonics Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Estrasburgo, France  
**Date of event:** 2006  
Soriano, M. C.; Verschaffelt, G.; Van Der Sande, G.; Peeters, M.; Lenstra, D.; Yousefi, M.; Danckaert, J. "Semiconductor Lasers and Laser Dynamics II. Proceedings of the SPIE., 618412 (10 páginas)".
- 49** **Title of the work:** The influence of current noise on the polarisation properties of VCSELs  
**Name of the conference:** IEEE/LEOS Benelux Chapter  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Mons, Belgium  
**Date of event:** 2005  
Soriano, M. C., Verschaffelt, G., Van Der Sande, G., Peeters, M., Lenstra, D., Yousefi, M.; Danckaert, J. "Proc. Symp. IEEE/LEOS Benelux Chapter, 257-260, 2005".



- 50** **Title of the work:** The influence of extra carrier noise on vertical-cavity surface-emitting lasers  
**Name of the conference:** European Quantum Electronics Conference, EQEC'05.  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Múnich, Germany  
**Date of event:** 2005  
Danckaert, J., Soriano, M. C., Van der Sande, G., Peeters, M., Verschaffelt, G., Yousefi, M.,; Lenstra, D.
- 51** **Title of the work:** Single-mode low frequency fluctuations in vertical cavity surface emitting lasers with polarization-filtered feedback  
**Name of the conference:** SPIE Photonics Europe  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Estrasburgo, France  
**Date of event:** 2004  
Cornelles Soriano, M., Yousefi, M., Romanelli, M., Giacomelli, G.,; Marin, F."Semiconductor Lasers and Laser Dynamics. Proceedings of the SPIE., 422-432".
- 52** **Title of the work:** The influence of extra carrier noise on vertical-cavity surface-emitting lasers  
**Name of the conference:** IEEE/LEOS Benelux Chapter  
**Type of event:** Conference  
**Type of participation:** Participatory - oral communication  
**City of event:** Gante, Belgium  
**Date of event:** 2004  
Soriano, M. C.; Verschaffelt, G.; Van Der Sande, G.; Peeters, M.; Lenstra, D.; Yousefi, M.; Danckaert, J."Proc. Symp. IEEE/LEOS Benelux Chapter, 49-52, 2004".
- 53** **Title of the work:** VCSEL with polarized optical feedback: experiment and model  
**Name of the conference:** IEEE/LEOS Benelux Chapter  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Twente, Holland  
**Date of event:** 2003  
Cornelles Soriano, M.; Yousefi, M.; Barland, S.; Romanelli, M.; Giacomelli, G.; Marin, F."Proc. Symp. IEEE/LEOS Benelux Chapter, 225-228, 2003".
- 54** **Title of the work:** Theoretical analysis of a polarisation switching VCSEL used as a Doppler velocimeter  
**Name of the conference:** IEEE/LEOS Benelux Chapter  
**Type of event:** Conference  
**Type of participation:** 'Participatory - poster  
**City of event:** Amsterdam, Holland  
**Date of event:** 2002  
Soriano, M. C.; Albert, J.; Veretennicoff, I.; Panajotov, K. "Proc. Symp. IEEE/LEOS Benelux Chapter, 262-265, 2002".



## Works submitted to national or international seminars, workshops and/or courses

- 1** **Title of the work:** Computing with Photonic Substrates  
**Name of the event:** Invited lecturer at the Machine Learning Photonics III (Lake Como School of Advanced Studies)  
**Reasons for participation:** Upon invitation  
**City of event:** Como, Italy  
**Date of event:** 02/09/2024  
**End date:** 06/09/2024
- 2** **Title of the work:** Complex Dynamics of Delay Systems  
**Name of the event:** Invited lecturer at the 11th Optoelectronics and Photonics Summer School on Neuromorphic Photonics (NMP2021)  
**Reasons for participation:** Upon invitation  
**City of event:** Trento, Italy  
**Date of event:** 20/06/2021  
**End date:** 26/06/2021
- 3** **Title of the work:** Quantum reservoir computing  
**Name of the event:** Invited lecturer at the Cargese School of Quantum Information and Quantum Technology  
**Reasons for participation:** Upon invitation  
**City of event:** Cargese, France  
**Date of event:** 06/2021
- 4** **Title of the work:** Ultrafast photonic reservoir computing: From fundamental properties to real-world applications.  
**Name of the event:** Invited lecturer at the Machine Learning Photonics (Lake Como School of Advanced Studies)  
**Reasons for participation:** Upon invitation  
**City of event:** Italy  
**Date of event:** 15/03/2021  
**End date:** 19/03/2021
- 5** **Title of the work:** Dynamics and applications of delay-coupled semiconductor lasers  
**Name of the event:** Invited course at ICTP-SAIFR School on Nonlinear Optics and Nanophotonics  
**Reasons for participation:** Upon invitation  
**City of event:** Sao Paulo, Brazil  
**Date of event:** 23/11/2013



## Other achievements

### Stays in public or private R&D centres

- 1** **Entity:** Laboratoire Kastler Brossel, Sorbonne University  
**City of entity:** Paris, France  
**Start date:** 2023 **Duration:** 7 days  
**Goals of the stay:** Guest  
**Provable tasks:** Quantum Reservoir Computing
- 2** **Entity:** Department of Applied Physics and Photonics, Vrije Universiteit Brussel  
**City of entity:** Brussels, Belgium  
**Start date:** 2013 **Duration:** 15 days  
**Goals of the stay:** Guest  
**Provable tasks:** Low frequency fluctuations in semiconductor ring lasers with optical feedback.
- 3** **Entity:** Universidad de Cantabria  
**City of entity:** Santander, Spain  
**Start date:** 2011 **Duration:** 15 days  
**Goals of the stay:** Guest  
**Provable tasks:** Time-series analysis via permutation and statistical complexity
- 4** **Entity:** Department of Applied Physics and Photonics, Vrije Universiteit Brussel  
**City of entity:** Brussels, Belgium  
**Start date:** 2010 **Duration:** 15 days  
**Goals of the stay:** Guest  
**Provable tasks:** Information processing using a single nonlinear node with delay
- 5** **Entity:** Department of Applied Physics and Photonics, Vrije Universiteit Brussel  
**City of entity:** Brussels, Belgium  
**Start date:** 2009 **Duration:** 15 days  
**Goals of the stay:** Guest  
**Provable tasks:** Dynamics of delay-coupled oscillators
- 6** **Entity:** Laser Center, Vrije Universiteit Amsterdam  
**City of entity:** Amsterdam, Holland  
**Start date:** 2005 **Duration:** 3 months  
**Goals of the stay:** Doctorate  
**Provable tasks:** The influence of extra carrier noise on vertical-cavity surface-emitting lasers
- 7** **Entity:** Istituto Nazionale per la Fisica della Materia del CNR  
**City of entity:** Florencia, Italy  
**Start date:** 2003 **Duration:** 5 months  
**Goals of the stay:** Contracted  
**Provable tasks:** Semiconductor lasers subject to polarized optical feedback



## Obtained accreditations/recognitions

- 1** **Description:** Profesor Titular de Universidad  
**Accrediting entity:** Agencia Nacional de Evaluación de la Calidad y Acreditación **Type of entity:** Fundación estatal  
**Date of recognition:** 2015
- 2** **Description:** Profesor Contratado Doctor  
**Accrediting entity:** Agencia Nacional de Evaluación de la Calidad y Acreditación **Type of entity:** Fundación estatal  
**Date of recognition:** 2012
- 3** **Description:** Profesor Ayudante Doctor  
**Accrediting entity:** Agencia Nacional de Evaluación de la Calidad y Acreditación **Type of entity:** Fundación estatal  
**Date of recognition:** 2010

## Summary of other achievements

- 1** **Description of the achievement:** Co-organizer of the workshop on Deep Learning in Unconventional Neuromorphic Hardware, co-located with IJCNN (International Joint Conference on Neural Networks) 2021, online.  
**Conferral date:** 2021
- 2** **Description of the achievement:** Co-organizer of The 1st International Workshop on Reservoir Computing, co-located with ICANN 2019 (Munich, Germany).  
**Accrediting entity:** European Neural Network Society  
**Conferral date:** 2019
- 3** **Description of the achievement:** Co-organizer of a special session on "Non-algorithmic computing by complex systems" at NOLTA 2018 (Tarragona, Spain).  
**Conferral date:** 2018
- 4** **Description of the achievement:** Organizer of a mini-symposium on "Consistency and Chaos in Complex Photonic Systems" at Dynamics Days Europe 2016 (Corfu, Greece) and co-organizer of a mini-symposium on "Laser and Complex Dynamics" at Dynamics Days Europe 2015 (Exeter, UK).  
**Conferral date:** 2016
- 5** **Description of the achievement:** Member of the Organizing and Scientific Committees of the International Conference on Delayed Complex Systems (DCS2012), Palma de Mallorca, Spain, June 2012.  
**Conferral date:** 2012
- 6** **Description of the achievement:** Capability to lead an independent research line: I am the official responsible for the Non-linear Physics Laboratory at the IFISC institute since January 2009. Co-responsible of the Non-linear Photonics Laboratory at the IFISC institute, which I helped developing under the supervision of Prof. Ingo Fischer.  
**Conferral date:** 2009





- 7** **Description of the achievement:** Awarded a Marie Curie Host Fellowships for Early Stage Research Training at the Laser Centre of the Vrije Universiteit Amsterdam.  
**Conferral date:** 2005
- 8** **Description of the achievement:** Rewarded twice with a Nortel award for remarkable grades at the 'Escuela Técnica Superior de Ingeniería de Telecomunicación de Barcelona (ETSETB)', part of the collaboration agreement between Nortel Networks and the Polytechnical University of Catalonia (UPC).
- 9** **Description of the achievement:** Committee Member of the specialized group of quantum optics and nonlinear optics (QUONLOP) of the Royal Spanish Society of Physics and the Spanish Society of Optics (2021-).
- 10** **Description of the achievement:** External evaluator for international funding bodies. Project evaluation for the "Agence Nationale de la Recherche" (ANR, France, 2014), the "Flemish Research Foundation" (FWO, Belgium, 2014-2017) and the "Spanish Research Agency" (AEI, Spain, 2018-2022).
- 11** **Description of the achievement:** Guest Editor for the journal Cognitive Computation for the Special Issue entitled "Trends in Reservoir Computing" together with Simone Scardapane (La Sapienza University of Rome, Italy), Claudio Gallicchio (University of Pisa, Italy), Alessio Micheli (University of Pisa, Italy) [https://link.springer.com/journal/12559/topicalCollection/AC\\_8970212584cf7a93abee92d574eb36c7](https://link.springer.com/journal/12559/topicalCollection/AC_8970212584cf7a93abee92d574eb36c7)
- 12** **Description of the achievement:** Guest Editor for the journal Nanophotonics for the Special Issue entitled "Neural Network Learning With Photonics And For Photonic Circuit Design" together with Shanhui Fan (Stanford University, USA), and Daniel Brunner (Femto-ST, France) [https://nanophotonics-journal.com/issues/volume12/volume12\\_issue05/](https://nanophotonics-journal.com/issues/volume12/volume12_issue05/)
- 13** **Description of the achievement:** Member of the PhD juries of Ilya Ermakov (Vrije Universiteit Brussel, 2011), Lilia Mashal (Vrije Universiteit Brussel, 2013), Andrés Aragonese (Universitat Politècnica de Catalunya, 2014), Lars Keuninckx (Vrije Universiteit Brussel, 2016), Émeric Mercier (CentraleSupélec, 2016), Bogdan Penkovskiy (Université Bourgogne-Franche-Comté, 2017), Fabio Galán Prado (University of the Balearic Islands, 2021), Nadezhda Semenova (Université Bourgogne-Franche-Comté, 2021), Krishan Harkhoe (Vrije Universiteit Brussel, 2022), Joshua Robertson (University of Strathclyde, 2022).
- 14** **Description of the achievement:** Member of the technical program committee of the International Symposium on Physics and Applications of Laser Dynamics, IS-PALD 2021.
- 15** **Description of the achievement:** Program Committee Member of the Conference on Emerging Topics in Artificial Intelligence (ETAI), 2021-2022.  
**Accrediting entity:** SPIE
- 16** **Description of the achievement:** Reviewer for 36 journals indexed in the Journal Citation Reports, including the most relevant in the field of Non-linear Dynamics and Optics. List of selected journals: Nature Communications, Science Advances, Light: Science and Applications, Physical Review X, Physical Review Letters, Optics Express, Optics Letters, IEEE Journal of Selected Topics in Quantum Electronics, Physical Review E, Frontiers in Computational Neuroscience, Chaos, and Optics Communications (Outstanding Reviewer in 2015).
- 17** **Description of the achievement:** Science Outreach: Co-ordinator of Outreach at IFISC (2018-2022). Co-organizer of the outreach event "Navegando por la complejidad del siglo XXI", sponsored by Obra Social La Caixa (2018-2020). Co-organizer of IFISC's stand at the Balearic Islands Science Fair in 2008 (Palma de Mallorca and Ibiza), 2009 (Mahón), 2010 (Palma de Mallorca) and 2011 (Ibiza). This event was organized by the government of the Balearic Islands. Co-organizer of IFISC Open Days, November 2009 and February 2013. Scientific supervisor of the exposition "Illuminate", which celebrated in Palma de Mallorca the 2015



International Year of Light. These activities promote science and research among the society in general and young students of the Balearic Islands.

- 18 Description of the achievement:** Supervision of undergraduate students: Coordinator of the Summer Undergraduate Research Fellowships at IFISC (2017). Co-supervisor of 'trabajos académicamente dirigidos' (supervised academic activities) at IFISC (Institute for Cross-Disciplinary Physics and Complex Systems) of bachelor students Neus Oliver and Pilar Vindel Sans. Co-supervisor of "Summer Undergraduate Research Fellowships" students Alejandro Rodríguez (2013), Toni Ramos (2015), Cristian Cogollos (2016), Quim Llorenç (2017), Álvaro Moreno (2018) at IFISC.
- 19 Description of the achievement:** Teaching experience: Theory and problems of Physics and Electromagnetism, with 560 teaching hours officially recognized at the University of the Balearic Islands at the bachelor level. I developed and supervised practical courses in Optoelectronics and Mechanics. I am also teaching the laboratory courses in Nonlinear Photonics of the Master in Complex Systems at IFISC.
- 20 Description of the achievement:** Technical Program Committee member of the European Semiconductor Laser Workshop (2019-2020).
- 21 Description of the achievement:** Topic Editor for the journal Entropy (2020-2022). In this journal, I served as a Guest Editor of the Special Issue "Ordinal and pattern-based quantifiers for nonlinear time series analysis" together with Luciano Zunino.  
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