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Current Position

CNRS Research Director & Deputy manager Dpt of Photonics, C2N, Palaiseau

Professional Experience

- 2018 **CNRS Research Director, C2N, Palaiseau**
- 2016– **Deputy manager of the C2N Photonics Dpt, C2N, Palaiseau**
- 2006– **Part-time lecturer, ENSTA: Quantum Physics (2006–) Statistical Physics (2011–). Sorbonne Univ., Master 2 lectures on Laser Techniques (2012–)**
- 2005 **CNRS Chargé de Recherche CR1**
- 2001 **CNRS Chargé de Recherche CR2, Laboratoire de Photonique et Nanostructures, Marcoussis**
- 2001 **Post-doc, (6 months) at CNET Bagneux**
- 1998–2000 **Marie-Curie Post-doctoral fellowship, (2 yrs) Istituto Nazionale di Ottica Applicata (Italy, Florence)**
- 1997–1999 **Part-time lecturer (ATER) , (1 yr) Univ. Paul-Sabatier (Toulouse)**
- 1993–1995 **PhD, Grant from Ministry of Research and teaching assistant at Université de Nice-Sophia Antipolis, Nice.**
- & 1996–1997
- 1995–1996 **Military Service, Research scientist at Institut d'Optique Théorique et Appliquée, Orsay.**
- 1993 **Doctoral training, (3 months), Glassboro College (NJ, USA)**

Education

- 2015 **Habilitation à Diriger des Recherches, Université de Paris-Sud, Orsay, Nonlinear spatiotemporal dynamics in semiconductor microcavities**
- 1998 **PhD in Physics, Université de Nice-Sophia Antipolis, Nice., Instabilité de recul dans des vapeurs de Sodium soumises à un fort champ laser, supervised by G. L. Lippi and J.R. Tredicce**
- 1993 **Engineering diploma from École Nationale Supérieure de Physique de Marseille, (now École Centrale Méditerranée)**

Selected recent contributions

- 1 *Extreme Events Prediction from Nonlocal Partial Information in a Spatiotemporally Chaotic Microcavity Laser*, V. A. Pammi, M. G. Clerc, S. Coulibaly, and S. Barbay, **Phys. Rev. Lett.** **130**, 223801 (2023)
- 2 *Pulse-timing symmetry breaking in an excitable optical system with delay*, S. Terrien, V. A. Pammi, B. Krauskopf, N. G. R. Broderick, and S. Barbay, **Phys. Rev. E** **103**, 012201 (2021)
- 3 *Equalization of pulse timings in an excitable microlaser system with delay*, S. Terrien, V. A. Pammi, N. G. R. Broderick, R. Braive, G. Beaudoin, I. Sagnes, B. Krauskopf, and S. Barbay, **Phys. Rev. Research** **2**, 023012 (2020)
- 4 *Weak signal enhancement by nonlinear resonance control in a forced nano-electromechanical resonator*, A. Chowdhury, M. G. Clerc, S. Barbay, I. Robert-Philip, R. Braive, **Nat. Commun.** **11**, 2400 (2020)
- 5 *Photonic computing with single and coupled spiking micropillar lasers*, V. A. Pammi, K. Alfaro-Bittner, M. G. Clerc, S. Barbay, **IEEE J. Sel. Top. Quantum Electron.** **26**, 1500307 (2019)
- 6 *Phase Stochastic Resonance in a Forced Nano-electromechanical Membrane*, A. Chowdhury, S. Barbay, M. G. Clerc, I. Robert-Philip, R. Braive, **Phys. Rev. Lett.** **119**, 234101 (2018)
- 7 *Spatiotemporal chaos induces extreme events in an extended microcavity laser*, F. Selmi, S. Coulibaly, Z. Loghmari, I. Sagnes, G. Beaudoin, M. G. Clerc, S. Barbay, **Phys. Rev. Lett.** **116**, 013901 (2016)
- 8 *Temporal summation in a neuromimetic micropillar laser*, F. Selmi, R. Braive, G. Beaudoin, I. Sagnes, R. Kuszelewicz, S. Barbay, **Opt. Lett.** **40**, 5690 (2015)
- 9 *Relative Refractory Period in an Excitable Semiconductor*, F. Selmi, R. Braive, G. Beaudoin, I. Sagnes, R. Kuszelewicz, S. Barbay, **Phys. Rev. Lett.** **112**, 183902 (2014)
- 10 *Excitability in a semiconductor laser with saturable absorber*, S. Barbay, R. Kuszelewicz, A. Giacomotti, **Opt. Lett.** **36**, 4476 (2011)

Scientific outreach

- Micro-lasers for neuromorphic computing, V. A. Pammi, S. Barbay, Photoniques 104, 26-29 (2020)
- Voici le premier neurone-laser, Science & Vie 1164, p. 99, sept. 2014
- Semiconductor Lasers Get Nerve, Synopsis in Physics (APS)
- Laser mimics biological neurons using light, News in Physicsworld.com
- Micropillar Laser Mimics Excitability of Neurons, S. Barbay, F. Selmi, 2physics.com blog (2014)