

# Daniele Bajoni

## PERSONAL INFORMATION



Researcher unique identifier(s):

ORCID 0000-0001-6506-8485

Research ID: P-8123-2015

Date of birth: June 9<sup>th</sup> 1976

Nationality: Italian

## • CURRENT POSITION

2014 – **Associate Professor**, Department of Electrical, Computing and Biomedical Engineering, University of Pavia, Italy.

## • PREVIOUS POSITIONS

2008 – 2014 **Assistant Professor** (with tenure), Department of Electrical, Computing and Biomedical Engineering, University of Pavia, Italy.

2005 – 2007 Post doctoral researcher at **LPN-CNRS in Marcoussis, France**, in the group led by prof. Jacqueline Bloch.

## • EDUCATION

2004 PhD in Physics: Faculty of Science - Department of Physics, University of Pavia, Italy. Title of the thesis: “Optical Spectroscopy of Photonic Crystals and Microcavities”. PhD supervisor: Prof. Giorgio Guizzetti. During the PhD I spent 6 months at the University of Sheffield in the group of prof. Maurice Skolnick.

2000 Master degree in Physics (Italian Laurea): Faculty of Science - Department of Physics, University of Pavia, Italy, supervisor Prof Giorgio Guizzetti.

## • INSTITUTIONAL RESPONSIBILITIES

2022 – **Vice-President** of the **Management Committee** (Comitato di Gestione) of the Master Degree in Artificial Intelligence for Science and Technology, a course jointly organized by the University of Pavia, the University of Milano-Bicocca and the University of Milan.

2022 **Member** of the **Group of Experts** for the definition of the proposal for a National Partnership in Quantum Technologies in the framework of the PNRR (Piano Nazionale di Ripresa e Resilienza).

- 2019 Member of the **Examination Board** for the selective procedure of a Researcher (RTDA) in Condensed Matter Physics, Engineering Department of Information Science DEI – University of Padova
- 2018 – Member of the **board of the Ph.D. School in Microelectronics**, Department of Electrical, Computing and Biomedical Engineering, University of Pavia, Italy.
- 2008 – **Faculty member**, Department of Electrical, Computing and Biomedical Engineering, University of Pavia, Italy.

#### ● ORGANIZATION OF SCIENTIFIC SCHOOLS OR CONFERENCES

- 2019 – Member of the **Organizing Committee** for the graduate summer school “Quantum devices for non-classical light generation and manipulation” held in Erice (IT). The school was hosted by the “Ettore Majorana foundation”, was highly successful and will be held every two years (the second edition of the school has been postponed to 2023 due to the COVID pandemics).

#### ● SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

- 2008 – I was relator or co-relator of 5 Master students (Francesco Manni, Cesare Tomasoni, Alberto Zambianchi, Saved Sam, Linda Gianini), and I was tutor or co-tutor of 6 PhD students (Stefano Azzini, Marco Grassani, Angelica Simbula, Micol Previde-Massara, Francesco Garrisi, Linda Gianini) at the Department of Electrical, Computing and Biomedical Engineering and at the Department of Physics, University of Pavia, Italy. Most of the PhD students have found post-doctoral positions in top international institutions (including two at the EPFL); my first PhD student (Stefano Azzini) has become associate professor at the University of Trento in 2022, both signs of the excellent scientific upbringing received by the PhD students. During the same period I took part in the coordination of the research work of several post-docs (Marco Liscidini, Stefano Azzini, Marco Grassani, Angelica Simbula, Francesco Garrisi, Federico Sabattoli, Marco Clementi).
- 2005 – 2007 I took part in the coordination of the research activities of two master students (Jean Loup Smirr and Esther Wertz) at LPN-CNRS in Marcoussis, France.

#### ● TEACHING ACTIVITIES

- All below courses are held at the Engineering Department, Università degli Studi di Pavia, Italy.
- 2018 – Professor of “Introduction to Quantum Mechanics and Quantum Technologies”, for master students (6 CFUs).
- 2015 – Professor of “General Physics II” (Electromagnetism), for undergraduates students (6 CFUs).
- 2012 – 2017 Professor of “Semiconductor Device Physics”, for master students (6 CFUs).
- 2008 – 2015 Professor of “General Physics I” (Mechanics and Thermodynamics), for undergraduate students (9 CFUs).

Some of the above course have had a number of students well exceeding 100 (>250 for General Physics I during some academic years, >200 for General Physics II during some academic years,). The teaching were always well received by the students, with excellent scores in the satisfaction questionnaires on the questions concerning teaching skills. Such scores are almost always above 8/10 and often above the average for the other courses in the same bachelor or master degree. In the table below are summarized the results for question D6 (“Il docente stimola/motiva l’interesse verso la disciplina?”) and for question D7 (“In caso di didattica ONLINE la qualità dello strumento tecnologico utilizzato è stata soddisfacente? In caso di didattica frontale, il docente ha esposto gli argomenti in modo chiaro?”) for the past 4 academic years.

	General Physics II				Introduction to Quantum Mechanics and Quantum Technologies			
	Daniele Bajoni		Average of all professors for the Bachelor Degree		Daniele Bajoni		Average of all professors for Master Degree	
	D6	D7	D6	D7	D6	D7	D6	D7
2021	8.14	8.02	7.90	8.14	8.80	9.40	8.71	8.85
2020	8.30	8.59	7.98	8.25	8.80	8.50	8.50	8.84
2019	8.88	7.81	7.77	7.94	8.33	8.67	8.44	8.57
2018	8.70	8.33	7.57	7.66	8.71	8.29	8.67	8.56

## ● SCIENTIFIC OUTPUT

Number of publications:	100
Percentage of publications with last authorship:	30%
Percentage of publications with first authorship:	18%
Percentage of publications with corresponding authorship:	27%

### Citations

Google Scholar:	3676
Scopus:	2685
ISI Web of Science:	2362

### H-factor

Google Scholar:	32
Scopus:	28
ISI Web of Science:	28

According to Clarivate (Web of Science), three of my papers ([Tacchino2019], [Grassani2015] and [Azzini2012OE]) have received enough citations to place them above the 99 citation percentile of their academic field.

## ● PUBLICATION HIGHLIGHTS

- **MIT Technology Review**, “Machine learning, meet quantum computing”, highlight on: npj Quantum Information, 5 art. no. 26 (2019) <https://www.technologyreview.com/2018/11/16/139049/machine-learning-meet-quantum-computing/>
- **IEEE Spectrum**, “Entanglement on a Chip”, highlight on: Optica 2, 88-94, (2015) <https://>

[spectrum.ieee.org/entanglement-on-a-chip](http://spectrum.ieee.org/entanglement-on-a-chip)

- **Science Daily** “Entanglement on a chip: Breakthrough promises secure communications and faster computers” highlight on: Optica 2, 88-94, (2015) <https://www.sciencedaily.com/releases/2015/01/150126095707.htm>
- **Gizmodo** “Quantum Entanglement Can Now Be Performed on a Chip” highlight on: Optica 2, 88-94, (2015) <https://gizmodo.com/quantum-entanglement-can-now-be-performed-on-a-chip-1683197204>
- **Galileo** “Un anello italiano a prova di spia” highlight on: Optica 2, 88-94, (2015) <https://www.galileonet.it/un-anello-italiano-a-prova-di-spia/>

## • EDITORIAL AND REVIEWING ACTIVITIES

2022 – **Associated Editor**, Frontiers in Photonics  
2019 – 2022 Member of the **Editorial Board**, Frontiers in Photonics

I have reviewed scientific projects for the following institutions

2021 Engineering and Physical Sciences Research Council (EPSRC, UK)  
2017 Agence Nationale de la Recherche (ANR, France)  
2016 European Research Council (ERC Starting grant)  
2011 – 2013 Italian Ministry of Education (MIUR, Italy)  
2011 Agence Nationale de la Recherche (ANR, France)  
2010 Department of Energy (DoE, United States of America)

## • DIRECTION OF SCIENTIFIC PROJECTS

2022 – **Unit Coordinator** of HYPERSPACE (36 month project, total financing about 2818331 euros, of which 292476 euros to my unit), a European project financed in the framework of the European Quantum Flagship to build a roadmap for a quantum link from EU to Canada.

2017 – 2019 **Principal Investigator** of the Blue Sky research project of the University of Pavia “Quantum Information Technologies with multiple degrees of freedom” (24 month project, total financing 60 keuros).

2014 – 2019 **Unit Coordinator** in the COST MP1403 action “Nanoscale Quantum optics” from 2014 to 2019.

2010 – 2013 **Principal Investigator** of the Italian Ministry of Research FIRB project “Nonlinear and quantum optics in photonics nano structures” (36 month project, total financing about 360 keuros).

2010 – 2012 **Principal Investigator** of the Alma Mater Ticinensis foundation project “Semiconductor devices for entangled photon pair generation” (24 month project, total financing 70 keuros).

2008 – 2010 **Principal Investigator** of the project from the National Interuniversity Consortium for the Physical Sciences of Matter (CNISM) “Photonic crystal polaritons for entangled photon generation” (36 month project, total financing about 250 keuros, national call for project with only 2 project financed over about 100 applications).

## • MAJOR COLLABORATIONS

### Academic Collaborations

- A recent collaboration with the group of prof. Roberto Morandotti of the Institut National de la Recherche Scientifique in Montreal (**INRS**, CA), has led to the successful application for a EU-Canada grant in the framework of the European Quantum Technologies Flagship.
- Laboratoire d'électronique des technologies de l'information (**CEA-LETI**, France): we have an ongoing collaboration where CEA-LETI provides devices that are designed and then studied in Pavia. We currently have a shared PhD student (Linda Gianini) spending half of her PhD in CEA-LETI and half in Pavia.
- **University of Toronto** (CA): the scientific collaboration with group of prof. John Sipe has started in 2010 and is ongoing, as demonstrated by the many papers published together.
- A collaboration with the group of Dirk Englund of the **MIT** (USA) and Christophe Galland of the **EPFL** has led to several works on silicon integrated devices for quantum photonics.
- We collaborated with the group of Marc Sorel at **University of Glasgow** for the realization of silicon integrated devices.
- A collaboration with the group of Jacqueline Bloch at the (**LPN-CNRS**, France) has been fundamental to start an experimental line of research on polaritons in Pavia.

### Industrial Collaborations

- Most of the works on quantum neural networks have been carried out in collaboration with **IBM**.
- The activity on quantum neural networks has led to a collaboration with Ente Nazionale Idrocarburi (**ENI**, IT) for the realization of a quantum auto-encoder for the analysis of data from oil and gas equipment in the framework of a larger collaboration between ENI and the University of Pavia
- I am currently working with Advanced Fiber Resources (**AFR**, China): I am relator of a master student working at AFR in Milan and we have an ongoing NDA agreement on integrated optics.
- I am collaborating with **Xanadu** (CA), on integrated quantum technologies and we have an ongoing NDA agreement.
- I am collaborating with **ST Microelectronics** (IT), on integrated quantum technologies and we have an ongoing NDA agreement. I have been relator of a master student working at ST.
- I worked with **Coriant Advanced Technology Group** (USA) for the realization of integrated circuits for the emission of entangled photon pairs.
- I am collaborating with **beSharp**, a spinoff of the University of Pavia, on the use of quantum computers on the Amazon Cloud. I have an ongoing teaching contract with beSharp for the training of their personnel on quantum computing.

## • INVITED TALKS

- “Generation of nonclassical light in silicon photonic structures under self-pumping” ICTON 2020
- “A source of heralded single photon using high quality factor silicon ring resonators” ICTON, Angers (FR) 2019

- “Quantum Computing Algorithm for a McCulloch-Pitts Neuron” University of Padua, 2019
- “Silicon photonic sources of nonclassical states of light” ENM, Barcellona (ES) 2018
- “Silicon photonic sources of nonclassical states of light ” META17, Incheon (KR) 2017
- “Four-wave mixing and generation of correlated photon pairs in silicon ring resonators and photonic molecules”, CLEO, San Jose (US) 2013
- “Quantum Nonlinear Optics in Integrated Silicon Photonic Structures”, SPIE Photonics North, Ottawa (CA) 2013
- “Quantum Optics in Silicon Ring Resonators”, University of Toronto (CA), 2013
- “Nonlinear optics and entangled photon pairs generation in silicon ring resonators”, University of Trento, 2013
- "Polariton diodes". 9th International Conference on Physics of Light-Matter Coupling in Nanostructures, Lecce (IT), 2009.
- "Polariton lasing in single micropillar semiconductor cavities". 9th International Workshop on Nonlinear Optics and Excitation Kinetics in Semiconductors, Klink (DE), 2008.
- "Thermalization of polaritons in III-V Microcavities". Condensed Matter and Materials Physics 2007, Leicester (UK), 2007.

## • MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2018 – Associated Member, National Institute for Photonics and Nanotechnologies (INFN-CNR, Italy)
- 2022 – Associated Member, National Institute for Nuclear Physics (INFN, Italy)
- 2015 – 2018 Associated Member, National Institute for Nuclear Physics (INFN, Italy)
- 2013,2015 Member, Optical Society of America
- 2008 – Associated Member, National Inter-university Consortium for the Physical Sciences of Matter (CNISM, Italy)

## • SCIENTIFIC AWARDS

- 2021 – Part of the list of Top Italian Scientists (<https://topitalianscientists.org>).
- 2021 The conference paper “A Quantum Computing Approach to Analyze the Behavior of Oil & Gas Equipment” won the the best paper award for innovative Technologies at the 2021 edition of the OMC Med conference.
- 2017 Although not funded, my Proposal for an ERC Consolidator grant received a Final panel Score of A (fully meets the ERC's excellence criterion and is recommended for funding if sufficient funds are available).

## • TRACK-RECORD.

After my PhD, I spent three years as a **post-doc** in the group of Jacqueline Bloch at the Laboratoire de Photonique et Nanostructures in France. The theme of the post doc concerned the emerging field of exciton polariton physics. I achieved many important results, including significant milestones in the field of polaritonics. Exciton polaritons are fascinating states that can form in a semiconductor cavity, and are hybrid waves part light, and part matter. In my research I **demonstrated** that confinement can greatly increase polariton interactions and showed **polariton**

**lasing in micropillar cavities** [Bajoni2008PRLa] and demonstrated that polariton diodes have very strong bistability [Bajoni2008PRLb].

In 2008 I became tenured at the Department of Electrical, Computing and Biomedical Engineering and the Department of Physics, University of Pavia, Italy. I started at the University of Pavia my own research group, building a **new research activity in experimental quantum optics**. The ultimate confinement in dielectric media is obtained in photonics crystal cavities, and we successfully worked toward the goal of getting strong light-matter coupling in such a cavity. This resulted in a polariton laser with threshold power in the nW range, which remains to date the **lowest reported threshold for a polariton lasing device** [Azzini2011]. My results on polariton physics are widely recognized and I have been asked to write a **review paper on invitation** on these topics [Bajoni2012].

The problem with polariton devices is that they generally need very low temperatures ( $<10\text{K}$ ) to work, limiting their applicability. Besides, I have always been convinced of the groundbreaking potentialities of producing entanglement in semiconductor devices, and the strong light-matter interactions in polariton systems make the generation of entanglement very difficult because of the presence of thermal noise sources. I therefore decided to move the research effort of my group toward **silicon integrated photonics**, which seemed to me to hold a much greater potential for quantum optics. Silicon has in fact a reasonably strong  $\chi^{(3)}$  nonlinearity, silicon photonic devices work at room temperature, and can be produced in standardized industrial processes, all properties I viewed as promising toward applications. We started investigating several ways to enhance silicon nonlinear processes using resonant integrated structures, including **ring resonators** [Azzini2012OL] and photonics crystal cavities [Azzini2013]. We found ring resonators to be solid and reliable structures for the generation of nonclassical states of light, and demonstrated emission of **photon pairs** from silicon rings [Azzini2012OE], a result that has taken my group at the forefront of research in silicon integrated sources of quantum states of light, and earned us several invited talks, including an **invited talk** at the **CLEO** conference in San Jose in 2013. One of our most **prominent achievement** is surely the demonstration that the **photon pairs** emitted by ring resonators are indeed **entangled** [Grassani2015], reaching the longstanding goal of a source of entangled photons which is microscopic, bright and integrated on a silicon chip. This result was featured by 35 different media outlets with an estimated audience of over 26 million (including the IEEE Spectrum, Science Daily and Gizmodo). Thanks to these results we started several international collaborations, including with scientific groups at the MIT and the EPFL [Harris2014], and an ongoing collaboration with the group of John Sipe at the University of Toronto. Another very important ongoing scientific collaboration my group has is with the Laboratoire d'électronique des technologies de l'information (CEA-LETI). Our competencies in quantum photonics and LETI's fabrication capabilities complement each other extremely well and we are working together to bring about novel devices for quantum information. We also have an ongoing **exchange program** for **PhD** students between our two institutions.

Starting in 2018, with the advent of the first quantum computing cloud services (IBMQ in particular) I also started an activity on the development of quantum algorithms to be run on actual quantum computing processors. I was convinced of the idea that machine learning, being heavily reliant on tensor mathematics, could benefit in particular from the highly parallel computation on quantum processors. I started working on **quantum artificial intelligence**, and my group began with the development of a **quantum artificial neuron** [Tacchino2019], a result that was highlighted by the MIT Technology Review while still in preprint form proving again my ability to advance the state of the art in quantum technologies. We then moved on to demonstrate fully **quantum neural networks** [Tacchino2020], showing a novel disruptive way to quantum machine learning based on the mathematical properties of hypergraphs.

To finance the research activities of my group I have successfully applied for several grants, totaling more than 1 million euros in funding over the years for projects of which I have been principal investigator or unit coordinator. This projects have financed a total of five years in research fellowships. Several young researchers have been trained as PhDs in the framework of these activities.

All these achievements also resulted in several and growing collaborations with large industrial firms. These have included over the years ST Microelectronics, Ente Nazionale Idrocarburi (ENI), Advanced Fiber Resources, beSharp and Xanadu.

[Tacchino2020] Tacchino, F., Barkoutsos, P., Macchiavello, C., Tavernelli, I., Gerace, D., **Bajoni, D.** “Quantum implementation of an artificial feed-forward neural network” (2020) *Quantum Science and Technology*, 5 (4), art. no. 044010.

[Tacchino2019] Tacchino, F., Macchiavello, C., Gerace, D., **Bajoni, D.** “An artificial neuron implemented on an actual quantum processor” (2019) *npj Quantum Information*, 5 (1), art. no. 26.

[Caspani2017] Caspani, L., Xiong, C., Eggleton, B.J., Bajoni, D., Liscidini, M., Galli, M., Morandotti, R., Moss, D.J. “Integrated sources of photon quantum states based on nonlinear optics” (2017) *Light: Science and Applications*, 6, art. no. e17100, *Review paper on invitation..*

[Grassani2015] Grassani, D., Azzini, S., Liscidini, M., Galli, M., Strain, M.J., Sorel, M., Sipe, J.E., **Bajoni, D.** “Micrometer-scale integrated silicon source of time-energy entangled photons” (2015) *Optica*, 2 (2), pp. 88-94.

[Harris2014] Harris, N.C., Grassani, D., Simbula, A., Pant, M., Galli, M., Baehr-Jones, T., Hochberg, M., Englund, D., **Bajoni, D.**, Galland, C. “Integrated source of spectrally filtered correlated photons for large-scale quantum photonic systems” (2014) *Physical Review X*, 4 (4), art. no. 041047.

[Azzini2013] Azzini, S., Grassani, D., Galli, M., Gerace, D., Patrini, M., Liscidini, M., Velha, P., **Bajoni, D.** “Stimulated and spontaneous four-wave mixing in silicon-on-insulator coupled photonic wire nano-cavities” (2013) *Applied Physics Letters*, 103 (3), art. no. 031117.

[Azzini2012OE] Azzini, S., Grassani, D., Strain, M.J., Sorel, M., Helt, L.G., Sipe, J.E., Liscidini, M., Galli, M., **Bajoni, D.** “Ultra-low power generation of twin photons in a compact silicon ring resonator” (2012) *Optics Express*, 20 (21), pp. 23100-23107.

[Azzini2012OL] Azzini, S., Grassani, D., Galli, M., Andreani, L.C., Sorel, M., Strain, M.J., Helt, L.G., Sipe, J.E., Liscidini, M., **Bajoni, D.** “From classical four-wave mixing to parametric fluorescence in silicon microring resonators” (2012) *Optics Letters*, 37 (18), pp. 3807-3809.

[Bajoni2012] **Bajoni, D.** “Polariton lasers. Hybrid light-matter lasers without inversion” (2012) *Journal of Physics D: Applied Physics*, 45 (31), art. no. 313001. *Review paper on invitation.*

[Azzini2011] Azzini, S., Gerace, D., Galli, M., Sagnes, I., Braive, R., Lemaître, A., Bloch, J., **Bajoni, D.** “Ultra-low threshold polariton lasing in photonic crystal cavities” (2011) *Appl. Phys. Lett.*, 99, 111106.

[Bajoni2008PRLb] **Bajoni, D.**, Semenova, E., Lemaître, A., Bouchoule, S., Wertz, E., Senellart, P., Barbay, S., Kuszelewicz, R., Bloch, J. “Optical bistability in a GaAs-based polariton diode” (2008) *Physical Review Letters* 101, 266402 (2008).

[Bajoni2008PRLa] **Bajoni, D.**, Senellart, P., Wertz, E., Sagnes, I., Miard, A., Lemaître, A., Bloch, J. “Polariton laser using single micropillar GaAs-GaAlAs semiconductor cavities” (2008) *Physical Review Letters* 100, 047401.

Pavia, May 12th 2022

Daniele Bajoni



## Full List of Published Articles

- [1] G. Pica, **Bajoni, D.**, and G. Grancini, “A step beyond in steady-state and time-resolved electro-optical spectroscopy: Demonstration of a customized simple, compact, low-cost, fiber-based interferometer system,” *Structural Dynamics*, vol. 9, no. 1, 2022.
- [2] **Bajoni, D.**, O. Nicosini, A. Rimini, and S. Rodini, “Collapse dynamics and hilbert-space stochastic processes,” *Scientific Reports*, vol. 11, no. 1, 2021.
- [3] F. Benatti, S. Olivares, G. Perosa, **Bajoni, D.**, S. Di Mitri, R. Floreanini, L. Ratti, and F. Parmigiani, “Quantum state features of the fel radiation from the occupation number statistics,” *Optics Express*, vol. 29, no. 24, pp. 40374–40396, 2021.
- [4] F. Sabattoli, H. El Dirani, L. Youssef, F. Garrisi, D. Grassani, L. Zatti, C. Petit-Etienne, E. Pargon, J. Sipe, M. Liscidini, C. Sciancalepore, **Bajoni, D.**, and M. Galli, “Suppression of parasitic nonlinear processes in spontaneous four-wave mixing with linearly uncoupled resonators,” *Physical Review Letters*, vol. 127, no. 3, 2021.
- [5] S. Mangini, F. Tacchino, D. Gerace, **Bajoni, D.**, and C. Macchiavello, “Quantum computing models for artificial neural networks,” *EPL*, vol. 134, no. 1, 2021.
- [6] S. Mangini, F. Tacchino, D. Gerace, C. Macchiavello, and **Bajoni, D.**, “Quantum computing model of an artificial neuron with continuously valued input data,” *Machine Learning: Science and Technology*, vol. 1, no. 4, 2020.
- [7] F. Tacchino, P. Barkoutsos, C. Macchiavello, I. Tavernelli, D. Gerace, and **Bajoni, D.**, “Quantum implementation of an artificial feed-forward neural network,” *Quantum Science and Technology*, vol. 5, no. 4, 2020.
- [8] T. Autry, G. Nardin, C. Smallwood, K. Silverman, **Bajoni, D.**, A. Lemaître, S. Bouchoule, J. Bloch, and S. Cundiff, “Excitation ladder of cavity polaritons,” *Physical Review Letters*, vol. 125, no. 6, 2020.
- [9] F. Garrisi, F. Andrea Sabattoli, S. Sam, A. Barone, M. Massara, F. Pirzio, F. Morichetti, A. Melloni, M. Liscidini, M. Galli, and **Bajoni, D.**, “Electrically driven source of time-energy entangled photons based on a self-pumped silicon microring resonator,” *Optics Letters*, vol. 45, no. 10, pp. 2768–2771, 2020.
- [10] A. Veronese, M. Patrini, **Bajoni, D.**, C. Ciarrocchi, P. Quadrelli, and L. Malavasi, “Highly tunable emission by halide engineering in lead-free perovskite-derivative nanocrystals: The  $\text{cs}_2\text{snx}_6$  ( $x = \text{cl}, \text{br}, \text{br}/\text{i}, \text{i}$ ) system,” *Frontiers in Chemistry*, vol. 8, 2020.
- [11] F. Garrisi, M. Massara, A. Zambianchi, M. Galli, **Bajoni, D.**, A. Rimini, and O. Nicosini, “Experimental test of the collapse time of a delocalized photon state,” *Scientific Reports*, vol. 9, no. 1, 2019.
- [12] F. Tacchino, C. Macchiavello, D. Gerace, and **Bajoni, D.**, “An artificial neuron implemented on an actual quantum processor,” *npj Quantum Information*, vol. 5, no. 1, 2019.
- [13] M. Clementi, K. Debnath, M. Sotto, A. Barone, A. Khokhar, T. Bucio, S. Saito, F. Gardes, **Bajoni, D.**, and M. Galli, “Cavity-enhanced harmonic generation in silicon rich nitride photonic crystal microresonators,” *Applied Physics Letters*, vol. 114, no. 13, 2019.
- [14] M. Previde Massara, F. Sabattoli, F. Pirzio, M. Galli, and **Bajoni, D.**, “Four-wave mixing in a silicon microring resonator using a self-pumping geometry,” *Applied Physics Letters*, vol. 113, no. 12, 2018.
- [15] M. Massara, M. Menotti, N. Bergamasco, N. Harris, T. Baehr-Jones, M. Hochberg, C. Galland, M. Liscidini, M. Galli, and **Bajoni, D.**, “Nonlinear characterization of a silicon integrated bragg waveguide filter,” *Optics Letters*, vol. 43, no. 5, pp. 1171–1174, 2018.
- [16] K. Debnath, M. Clementi, T. Bucio, A. Khokhar, M. Sotto, K. Grabska, **Bajoni, D.**, M. Galli, S. Saito, and F. Gardes, “Ultrahigh-q photonic crystal cavities in silicon rich nitride,” *Optics Express*, vol. 25, no. 22, pp. 27334–27340, 2017.
- [17] **Bajoni, D.** and M. Galli, “Nonclassical light sources for silicon photonics,” *Photonics and Nanostructures - Fundamentals and Applications*, vol. 26, pp. 24–34, 2017.
- [18] L. Caspani, C. Xiong, B. Eggleton, **Bajoni, D.**, M. Liscidini, M. Galli, R. Morandotti, and D. Moss, “Integrated sources of photon quantum states based on nonlinear optics,” *Light: Science and Applications*, vol. 6, 2017.

- [19] A. Simbula, G. Rodriguez, M. Menotti, S. De Pace, S. Weiss, M. Galli, M. Liscidini, and **Bajoni, D.**, “Low-power four-wave mixing in porous silicon microring resonators,” *Applied Physics Letters*, vol. 109, no. 2, 2016.
- [20] D. Grassani, A. Simbula, S. Pirotta, M. Galli, M. Menotti, N. Harris, T. Baehr-Jones, M. Hochberg, C. Galland, M. Liscidini, and **Bajoni, D.**, “Energy correlations of photon pairs generated by a silicon microring resonator probed by stimulated four wave mixing,” *Scientific Reports*, vol. 6, 2016.
- [21] M. Malerba, A. Alabastri, E. Miele, P. Zilio, M. Patrini, **Bajoni, D.**, G. Messina, M. Dipalo, A. Toma, R. Zaccaria, and F. De Angelis, “3d vertical nanostructures for enhanced infrared plasmonics,” *Scientific Reports*, vol. 5, 2015.
- [22] D. Grassani, S. Azzini, M. Liscidini, M. Galli, M. Strain, M. Sorel, J. Sipe, and **Bajoni, D.**, “Micrometer-scale integrated silicon source of time-energy entangled photons,” *Optica*, vol. 2, no. 2, pp. 88–94, 2015.
- [23] A. Resmini, I. Tredici, C. Cantalini, L. Giancaterini, F. De Angelis, E. Rondanina, M. Patrini, **Bajoni, D.**, and U. Anselmi-Tamburini, “A simple all-solution approach to the synthesis of large zno nanorod networks,” *Journal of Materials Chemistry A*, vol. 3, no. 8, pp. 4568–4577, 2015.
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