

PERSONAL INFORMATION

Romeo Bernini

Consiglio Nazionale delle Ricerche (CNR)- Istituto per il Rilevamento Elettromagnetico dell'Ambiente (IREA) – Via Diocleziano 328 – 80124 Napoli (Italia)



<https://scholar.google.com/citations?user=8gtUfNkAAAAJ&hl=it>

ORCID ID 0000-0003-0300-4384

Date of birth

Nationality

Current Position Research director at CNR-IREA in Napoli

RESEARCH INTERESTS

Summary

The primary focus of my work is the development of optical devices and sensors based on integrated optics and fiber optics technologies. Integrated optical devices are fabricated using conventional silicon photonics technologies but also novel polymeric and hybrid silicon-polymer processes. These devices could be used as sensors in environmental or biomedical field but can also find application in the industrial or food sector. Another part of my activity is aimed at the development of distributed fiber optic sensors based on scattering phenomena like Rayleigh or Brillouin

Bibliometric Indicators

SCOPUS: h-index 30, citations 3325, documents 201
Google Scholar: h-index 36, citations 4252, i10-index 92

WORK EXPERIENCE

From 17/02/2020 to today

CNR Research Director at Institute for Electromagnetic Sensing of the Environment – Napoli

- Design, development, performance assessment and experimental validation of fluorescence and Raman spectroscopic sensor for environmental applications;
- Development and fabrication of polymer waveguides and devices using direct writing photolithographic processes;
- Development and fabrication of polymeric optofluidic resonators;

From 01/01/2007 to 16/02/2020

CNR Senior Researcher at Institute for Electromagnetic Sensing of the Environment – Napoli

- Development of sensors for Raman spectroscopy, some of which are portable, which can be used in monitoring water quality or in the spectroscopic analysis of liquids.
- Development of high resolution fiber optic distributed sensor based on stimulated Brillouin scattering for static and dynamic sensing.
- Development of integrated optofluidic devices based on antiresonant optical waveguides (ARROW) for sensing applications.
- Development of optical and optofluidic micro-devices in polymer and hybrid micro-devices, the latter obtained through the integration of silicon components and polymeric materials

From 15/03/2001 to 31/12/2006

CNR Researcher at Institute for Electromagnetic Sensing of the Environment – Napoli

- Development of fiber optic distributed sensor based on stimulated Brillouin scattering.
- Development of integrated antiresonant optical waveguides (ARROW) for sensing applications.

From 01/11/1999 to 14/03/2001

Fellowships at Second university of Naples, Department of information engineering

- Research and development activities on optical characterization of electronic material and devices.

EDUCATION AND TRAINING

1995

Ph.D. degree in Electronic Engineering

Second university of Naples, Italy

Thesis: "An optical sensing technique for dopant profiling in microelectronics and optoelectronics".

1999

Master of Science in Electronic Engineering

University Federico II of Napoli, Italy

Degree in Electronic Engineering, summa cum laude, with a thesis on "Optical characterization of semiconductors".

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
B2	C1	B1	B2	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

INSTITUTIONAL RESPONSIBILITIES

- 2001 – today Founder and responsible of the optoelectronic and sensors laboratory the Institute for Electromagnetic Sensing of the Environment IREA-CNR.
- 2011 – today Member of the working group for support and advice of the executive project of the Technological Pole in via Marconi, the new headquarters of the Institute for Electromagnetic Sensing of the Environment.
- 2010 – 2016 Member of the Council of the Institute for Electromagnetic Sensing of the Environment IREA-CNR.

NATIONAL AND INTERNATIONAL GRANTS (as principal investigator)

- 2018 – 2023 STRONGRCRAFT " Safe, Technically Robust and Optical New Generation fuel system to be integrated on new RotorCRAFT ", European Commission H2020 CLEAN SKY 2
Role: CNR-IREA research unit leader.
Research activities: development of an optical fuel level sensor for helicopters.
Project budget: € 1957658,75 ; CNR-IREA budget: € 150.000,00
- 2017 – 2020 SMARTECOPONICS "On-site microbial sensing for minimising environmental risks from aquaponics to human health", European Commission H2020 WaterWorks2015 ERA-NET Cofund.
Role: CNR-IREA research unit leader.
Research activities: development of an optical sensor prototype based on fluorescence spectroscopy for microbial monitoring in water samples.
Project budget: € : 636614 ; CNR-IREA budget: € 85922,23
- 2016 – 2018 BRIDAS "Brillouin Distributed sensor for Aeronautical Structures ". European Commission H2020 CLEAN SKY 2
Role: CNR-IREA research unit leader.
Research activities: development of a distributed fiber optic sensor for structural health monitoring of aeronautical structures.
Role: CNR-IREA research unit leader.
Project budget: € 350281,25; CNR-IREA budget: € 135156.25
- 2013 – 2017 HEMOSPEC (Advanced spectroscopic hemogram for personalized care against live threatening infections using an integrated chip-assisted bio-photonics system technologies) - European Commission (FP7-ICT)
Role: CNR-IREA research unit leader
Research activities: Contribution to the development and manufacture of the opto-microfluidic prototype for laboratory tests.
Project budget: € 3.770.00,00 ; CNR-IREA budget: € 204.000,00
- 2012 – 2016 SAFUEL (The Safer FUEL system) - European Commission (FP7-Transport)
Role: CNR-IREA research unit leader.
Research activities: Development and manufacture of an optical fuel level sensor.
Project budget: € 4.789.4841,81 Euro ; CNR-IREA budget: € 339.879,45

- 2012– 2016 NANODEM (NANOphtonic DEvice for Multiple therapeutic drug monitoring)
Role: CNR-IREA research unit leader and WP4 leader.
Research activities: Contribution to the realization of the opto-microfluidic chip prototype for laboratory tests.
Project budget: € 3.983.000,00 ; CNR-IREA budget: € 220.000,00
- 2010 – 2014 VIGOR (Valutazione del potenziale Geotermico delle regiOni ConveRgenza) - MIUR project
Role: CNR-IREA research unit leader.
Research activities: Contribution to the development and manufacture of distributed fiber optic sensors for geothermal applications and participation in a survey campaign.
Project budget: € 8.000.000,00; CNR-IREA budget: € 217.931,60
- 2010 – 2010 FOSAS "Fiber Optic Sensors Application for Structural Health Monitoring", European Commission FP7 CLEAN SKY
Role: CNR-IREA research unit leader
Research activities: Contribution to the development of the distributed fiber optic sensor.
Project budget: € 105910; CNR-IREA budget: € 19905.

TEACHING ACTIVITY

- 2019-Today Member of Advisory Committee of ASCOS, the Advanced Study Course on Optical Sensors.
2017 Co-Director and professor of the third National school of optical biosensors and biophotonics.
2014 Co-Director and professor of the second National school of optical biosensors and biophotonics.
2010 Professor of the first National school of optical biosensors and biophotonics.
2008 Professor of 2nd School of optical technologies "Photonics and nanotechnologies".
From 2002-2005 Contract professor of "Electronics" at the faculty of Engineering of University of Sannio (Benevento) Italy.

ORGANIZATION OF SCIENTIFIC MEETINGS (in the last 10 years)

- 2017-Today Member of Program Committee of conference "Integrated Optics: Devices, Materials, and Technologies", SPIE Photonic West.
2019 Member of Program Committee of conference PHOTOPTICS 2019.
2019-today Europtrode conference permanent steering committee member
2018 Organizer and general chair of Europtrode XIV, International conference on chemical and biochemical optical sensors.
2013 Member of Program Committee of 2nd EOS Conference on Optofluidics (EOSOF 2013).
2012-2015 Member of "Biophotonics and Optofluidics" Subcommittee for the the Conference on Lasers and Electro-Optics (CLEO) Conference.

FURTHER INFORMATION

National and international acknowledgments

2013 -The publication Persichetti, G., Testa, G., Bernini, R. "High sensitivity UV fluorescence spectroscopy based on an optofluidic jet waveguide" (2013) Optics Express, 21 (20), pp. 24219-24230. (DOI: 10.1364 / OE.21.024219), demonstrates, for the first time, the application of a water jet for the detection of water pollutants. This innovative and highly sensitive approach has opened up new perspectives in liquid analysis. The interest generated by the possible commercial applications of these researches has been recognized by numerous popular publications in the sector.

Optical Society of America (OSA)

- Optics & Photonics News - December 2013, (http://www.opnmagazine-digital.com/opn/december_2013?pg=14#pg14)
- Photonics Magazine OPLI, (http://www.opli.net/opli_magazine/eo/2013/naked-jets-of-water-make-a-better-pollutant-detector/)
- Science Daily, (<http://www.sciencedaily.com/releases/2013/10/131003162942.htm>)
- Photonics Spectra, (<http://www.photonics.com/Article.aspx?AID=55429>)

1999 Best IEEE-LEOS Doctoral Thesis Award in Optoelectronics

Invited talks

- Invited talk "Optofluidics for lab on chip applications" at the international conference Photonics and Electromagnetics Research Symposium, PIERS 2019 in Prague, Czech Republic, 17-20 June, 2019
- Invited talk "Versatile optofluidic platform for Raman and fluorescence spectroscopy of liquids" at the international conference SPIE 2019 International Symposium on Optics + Optoelectronics, in Prague, Czech Republic, 01-04 April, 2019.

- Plenary talk "Optofluidic Waveguides for Photonic Devices and Sensing Applications" at the international conference Optofluidics 2016, 24-27, July, Beijing, China
- Invited talk "Optofluidic devices and platforms for sensing applications" at the international conference Progress In Electromagnetics Research Symposium, PIERS 2015 in Prague, Czech Republic, 06-09 July, 2015
- Invited talk "Silicon-PDMS optofluidic integration" at the international conference Silicon Photonics X, San Francisco California USA, 9-12 February 2015.
- Invited lecture "Optofluidics: a new tool for sensing" at the international conference European Workshop on Optical Fibre Sensors (EWOFS-2013), Krakow POLAND 19-22 MAY 2013.
- Invited talk "Optofluidics as a novel platform for optical sensors" at the national conference Italian National Conference on Condensed Matter Physics Fismat 2013, Milan (Italy), 09-13 September 2013.
- Invited talk "Optofluidics: waveguides and devices" at the international conference Integrated Optics: Devices, Materials, and Technologies XVI Conference, SPIE Photonic West 2012, San Francisco, California, USA. 21–26 January 2012
- Invited talk "Integrated optofluidic interferometric devices" at the international conference 1st EOS Conference on Optofluidics (EOSOF 2011) 23 May 2011 - 25 May 2011 Munich (ICM), Germany.
- Invited Talk "Waveguide-based optofluidics" at the international conference Silicon Photonics V Conference, SPIE Photonic West 2010, San Francisco, USA, 23 – 28 January 2010.
- Invited Talk "Integrated silicon optical sensors based on hollow core waveguide" at the international conference Silicon Photonics II Conference, Photonics West 2007, San Jose, California USA, 20–25 January 2007. .

Evaluation of research results

Referee for international journals.

Evaluator of research and development projects funded by Italian Ministry of Economic Development (MISE).

Evaluator of research projects for young researcher "Rita Levi Montalcini" funded by by Italian Ministry of Research (MUR).

Evaluator of research projects Funded by National Science Centre (Narodowe Centrum Nauki – NCN), Polonia.

Evaluator of research projects "futuro in ricerca (FIR) giovani", funded by by Italian Ministry of Research (MUR).

Membership

Member of Consorzio Nazionale Interuniversitario per le Telecomunicazioni CNIT (Unità di Ricerca IREA-CNR) since 2005.

Member of IEEE society Photonic Society since 2001.

List of the top publications (in the last ten years)

1. P. Imperatore, G. Testa, G. Persichetti, R. Bernini, R., "Power Coupling Between Light Diffusing Fibers: Modelling and Validation", Journal of Lightwave Technology, 40 (3), pp. 813-821, 2022.
2. E. Catalano, R. Vallifuoco, R. Bernini, L. Zeni, A. Minardo, "Quasi-distributed refractive index sensing by stimulated Brillouin scattering in tapered optical fibers", Journal of Lightwave Technology 40 (8), 2619-2624 , 2022.
3. G. Testa, G. Persichetti, R. Bernini, "All-polymeric high-Q optofluidic Fabry–Perot resonator", Optics Letters, 46 (2), pp. 352-355, 2021.
4. Imperatore, P., Persichetti, G., Testa, G., Bernini, R., "Continuous Liquid Level Sensor Based on Coupled Light Diffusing Fibers", IEEE Journal of Selected Topics in Quantum Electronics, 26 (4),2020.
5. R Bernini, G Persichetti, E Catalano, L Zeni, A Minardo , "Refractive index sensing by Brillouin scattering in side-polished optical fibers", Optics letters 43 (10), 2280-2283, 2018.
6. G Testa, G Persichetti, R Bernini, "Hollow-Core-Integrated Optical Waveguides for Mid-IR Sensors", IEEE Journal of Selected Topics in Quantum Electronics 24 (6), 1-8, 2018.
7. G Persichetti, IA Grimaldi, G Testa, R Bernini, "Self-assembling and packaging of microbottle resonators for all-polymer lab-on-chip platform", Sens. Actuators A: Phys., 280, pp.271-276,2018.
8. R Bernini, G Persichetti, E Catalano, L Zeni, A Minardo , "Refractive index sensing by Brillouin scattering in side-polished optical fibers", Optics letters 43 (10), 2280-2283, 2018.
9. A Barucci, IA Grimaldi, G Persichetti, S Berneschi, S Soria, B Tiribilli, R. Bernini, F. Baldini, G. Nunzi Conti, "Selective coupling of Whispering Gallery Modes in film coated micro-resonators", Optics Express 26 (9), 11737-11743, 2018.

10. G Persichetti, IA Grimaldi, G Testa, R Bernini, "Multifunctional optofluidic lab-on-chip platform for Raman and fluorescence spectroscopic microfluidic analysis", *Lab on a Chip* 17 (15), 2631-2639, 2017.
11. A. Minardo, R. Bernini, R Ruiz-Lombera, J Mirapeix, JM Lopez-Higuera, "Proposal of Brillouin optical frequency-domain reflectometry (BOFDR)", *Optics Express* 24 (26), 29994-30001, 2016.
12. IA Grimaldi, G Testa, G Persichetti, F Loffredo, F Villani, R. Bernini, "Plasma functionalization procedure for antibody immobilization for SU-8 based sensor", *Biosensors and Bioelectronics* 86, 827-833, 2016.
13. A Minardo, A Coscetta, R. Bernini, L Zeni, "Brillouin Optical Time Domain Analysis in Silica Fibers at 850-nm Wavelength", *IEEE Photonics Technology Letters* 28 (22), 2577-2580, 2016.
14. A. Minardo, A. Coscetta, R. Bernini, L. Zeni, "Heterodyne slope-assisted Brillouin optical time-domain analysis for dynamic strain measurements", *Journal of Optics* 18 (2), 025606, 2016.
15. G. Testa, C. Collini, L. Lorenzelli and R. Bernini, "Planar Silicon-Polydimethylsiloxane Optofluidic Ring Resonator Sensors," *IEEE Photon. Technol. Lett.*, vol. 28, no. 2, pp. 155-158, 2016.
16. I.A. Grimaldi, G. Testa, R. Bernini, "Flow through ring resonator sensing platform", *RSC Advances* 5 (86), 70156-70162, 2015.
17. G. Testa, G. Persichetti, and R. Bernini, "Micro flow cytometer with self-aligned 3D hydrodynamic focusing", *Biomedical Optics Express*, Vol. 6, Issue 1, pp. 54-62, 2015.
18. I.A. Grimaldi, S. Berneschi, G. Testa, F. Baldini, G. N. Conti, R. Bernini, "Polymer based planar coupling of self-assembled bottle microresonators", *Appl. Phys. Lett.*, Vol. 105, 23, 2014.
19. G. Testa, G. Persichetti, R. Bernini, "Design and Optimization of an Optofluidic Ring Resonator Based on Liquid-Core Hybrid ARROWs", *IEEE Photonics Journal*, Vol. 6, 2014
20. A. Minardo, R. Bernini, L. Zeni, "Experimental and numerical study on stimulated Brillouin scattering in a graded-index multimode fiber", *Opti. Express*, Vol. 22, 14, pp. 17480-17489, 2014.
21. A. Minardo, A. Coscetta, L. Zeni, R. Bernini "High-Spatial Resolution DPP-BOTDA by Real-Time Balanced Detection", *IEEE Photonics Technology Letters*, Vol.26, pp.1251-1254, 2014.
22. A. Minardo, R. Bernini, and L. Zeni, "Distributed Temperature Sensing in Polymer Optical Fiber by BOFDA", *IEEE Photonics Technology Letters*, Vol.26, pp.387-390, 2014.
23. G. Testa, G. Persichetti, P.M. Sarro, R. Bernini, "A hybrid silicon-PDMS optofluidic platform for sensing applications", *Biomedical Optics Express*, Vol.5, pp.417-426, 2014.
24. A. Minardo, R. Bernini, and L. Zeni, "Bend-Induced Brillouin Frequency Shift Variation in a Single-Mode Fiber", *IEEE Photonics Technology Letters*, Vol.25, pp.2362-2364, 2013.
25. G. Persichetti, G. Testa, R. Bernini, "Optofluidic jet waveguide for laser induced fluorescence spectroscopy", *Optics Letters*, Vol. 37, Issue 24, pp. 5115-5117, 2012.
26. A. Minardo, L. Zeni, R. Bernini, "High-Spatial- and Spectral-Resolution Time-Domain Brillouin Distributed Sensing by Use of Two Frequency-Shifted Optical Beam Pairs", *IEEE Photonics Journal*, Vol. 4, 5, pp.1900-1908, 2012.
27. G. Testa, R. Bernini, "Integrated tunable liquid optical fiber", *Lab on Chip*, Vol., 19, pp. 3670-3672, 2012.
28. AG. Testa, Y. Huang, L. Zeni, P. M. Sarro and R. Bernini, "Hybrid Silicon-PDMS optofluidic ARROW waveguide", *IEEE Photon. Technol. Lett.*, Vol, 24, 15, pp.1307-1309, 2012.
29. R. Bernini A. Minardo, L. Zeni, "Distributed sensing at cm-scale spatial resolution by BOFDA: measurements and signal processing", *IEEE Photonics Journal*, Vol.4, N.1, pp.48-56, 2012.

Personal data

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV

Date: Napoli, 17 Janury 2023

Signature: Romeo Bernini