

**CURRICULUM VITÆ  
OF  
ANGELO SAMPAOLO**



📍 Dipartimento di Interateneo di Fisica, Politecnico di Bari  
 Via Amendola 173, 70126, Bari, ITALY  
📞 +39 08005442185  
✉ angelo.sampaolo@poliba.it

Male | 03/06/1984 | Italian

**Current Position:**

Enterprise	University	EPR
<input type="checkbox"/> Management Level	<input type="checkbox"/> Full professor	<input type="checkbox"/> Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
<input type="checkbox"/> Mid-Management Level	<input type="checkbox"/> Associate Professor	<input type="checkbox"/> Level III Researcher and Technologist
<input type="checkbox"/> Employee / worker level	<input checked="" type="checkbox"/> X Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	<input type="checkbox"/> Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

**WORK EXPERIENCE**

- from 18/05/2021 to today **C.EO. of the Academic Spin-off Polysense Innovations s.r.l**  
*Company devoted to development of innovative solutions for gas sensing applications*
- from 20/12/19 to today **Assistant professor in Experimental Physics**  
*Politecnico di Bari*
- from 02/07/18 to 19/12/20 **Assistant researcher in Experimental Physics and Laser Spectroscopy**  
*Politecnico di Bari*
- from 01/10/18 to 31/12/19 **Visiting Research Associate**  
*Institute of Laser Spectroscopy of Shanxi University (China)*
- from 01/10/18 to 31/12/19 **Assistant researcher in Applied Physics and Laser spectroscopy**  
*Università di Bari*
- from 01/10/18 to 31/12/19 **Research Intern**  
*Aramco Service Company Research Center (Houston, TX).*  
*Title of the project: Development of methane, ethane, propane, butane sensor for gas fields reservoir design.*

from 01/10/18 to 31/12/19 **Research Associate**  
*Laser Science Group of Rice University (Houston, TX)*

## EDUCATION AND TRAINING

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- 2017 Ph.D. Degree in Physics at University of Bari  
 Title of the thesis: "**Innovative opto-acoustic sensors for trace gas detection: from near-IR to THz**", supervised by proff. V. Spagnolo and Frank K. Tittel.
- 2013 Masters Degree in Physics at University of Bari  
 Title of the thesis: "**Quartz enhanced opto-acoustic sensor operating in the THz spectral range**", supervised by proff. V. Spagnolo

## PERSONAL SKILLS

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Mother tongue(s) Italian

Other language(s) English, proficiency Level: Advanced

Project-related expertise The main scientific skills of Angelo Sampaolo are related to the development of spectroscopic techniques for studying the light-matter interaction in the infrared range. The main investigated areas are: i)  $\mu$ -Raman and photoluminescence spectroscopy to study the thermal mapping and heat transmission in quantum devices, ii) infrared molecular spectroscopy for sensitive and selective detection of molecules using quantum-based sources. Since 2017, he's member of the technical committee of the joint-research lab PolySense, created by THORLABS GmbH and Technical University of Bari, devoted to the development and implementation of novel gas sensing techniques and the realization of highly sensitive photoacoustic trace-gas sensors. From 2014 to 2016, Prof. Sampaolo was a Visiting Researcher at Laser Science Group, Electrical and Computer Engineering Department, Rice University, Houston, Texas) for development of novel spectroscopic techniques for molecular infrared and THz detection. In 2017, Prof. Sampaolo worked as research intern for Aramco services Company in Houston for development of natural gas QEPAS spectrometers. In 2018 he was a Visiting Researcher at Institute of Laser Spectroscopy in Shanxi University, Taiyuan, China, within the "Hundred Talents" project of Chinese Academy of Science. His research activity is documented by 135 Scopus publications and 3 filed patents (more than 2000 citations, h-index 34). He has given more than 30 presentations at international conferences and workshops, 6 as invited speaker. Prof. Sampaolo is member of the Politecnico di Bari research unit in the European Project "Passepartout". He is editor of Sensors (MPDI) and Molecules (MDPI). Angelo Sampaolo is co-founder and C.E.O. of "PolySenSe Innovations s.r.l.", a spin-off company of the Politecnico di Bari, devoted to the development of optical-based sensors, technical training for companies, and to find solution to strategic problems. The main activities are:

- on demand development of electronic devices and gas sensors for detection and monitoring of physical quantities in critical fields
- sharing expertise with the staff of national and international companies, research institutions and public administration.

- finding best solutions to strategic problems related to the "new green deal", ecological transition and national plan on recovery and resilience.
- approaching applications related to gas sensing using innovative spectroscopic approaches for sustainable progress.

He has been ranked among Top 2% Scientists in the world by Stanford University, USA in the 2019- and 2020-year list (<https://data.mendeley.com/datasets/btchxktzyw/3>).

## ADDITIONAL INFORMATION RELEVANT TO QUANTUM SCIENCE AND TECHNOLOGY

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### International collaborations

- **Nanyang Technological University - NTU Singapore:** Design and Realization of compact and versatile QEPAS-based sensor box for simultaneous detection of methane and infrared absorber gas molecules in ambient air.
- **Institute of Electronics and Systems, University of Montpellier II, France** - Realization and development of long wavelengths ( $> 12 \mu\text{m}$ ) quantum laser sources for BTEX and VOCs detection.
- **Institute of Chemical Technologies and Analytics, Technical University of Wien, Austria** – Study of photo-thermal phenomena for highly sensitive molecular detection in quantum physics
- **Walter Schottky Institute, Technical University of Munich, Germany** - Development of Multi-wavelength Mid-Infrared Quantum Cascade Laser Integrated Photonic Circuit
- **Institute of Laser Spectroscopy, Shanxi University, China** - Development of sensing systems for air pollutants detection
- **Electrical and Computer Engineering (ECE) Department, Rice University, U.S.** - Astro Project. Realization of an urban-scale sensor network for real-time ppbv-level detection of VOCs to enable the first high-resolution drone-based public environmental sensing system of hydrocarbons and industrial chemicals in an under-served urban community.

### Projects

- Team Member in the **European Project ITN- OPTAPHI** "Optical Sensing Using Advanced Photo-Induced Effects" (Marie Skodowska-Curie Innovative Training Networks, H2020-MSCA-ITN-2019).
- Team Member of Research Unit "Politecnico di Bari" in the **European Project "H2020-ICT-37-2020-101016956" – PASSEPARTOUT** "Photonic Accurate and Portable Sensor Systems Exploiting Photo-Acoustic and Photo-Thermal Based Spectroscopy for Real-Time Outdoor Air Pollution Monitoring".
- Workpackage leader and Head of the BBC lab in the Italian Infrastructural project **BRIEF**.

Industrial collaborations

- Joint industry-university research lab named **PolySenSe**, located in the physics department at the Politecnico di Bari. The activity of this joint-research laboratory is devoted to the design and realization of spectroscopic systems for in situ and real-time gas detection, leading to advancements in breath analysis, environmental monitoring, leaks detection, hydrocarbon gas sensing and monitoring of toxic gases and explosive precursors.
- **ETG Risorse e Tecnologia Srl, Italy** - Design and Realization of a compact Quartz-Enhanced Photoacoustic Sensor for simultaneous detection of N<sub>2</sub>O, CH<sub>4</sub> and NH<sub>3</sub> with for monitoring agricultural activities
- **Aramco Research Center, Houston, U.S.** - Design and Realization of a compact Quartz-Enhanced Photoacoustic Sensor for simultaneous detection of methane, ethane, and propane for upstream, midstream, and downstream petrochemical sectors.
- **Masmec S.p.a, Italy** - Spectroscopic sensor for gas leak detection for mechatronic components.
- **Tersan Puglia** - Sensors system for monitoring of pressure, temperature and relative humidity inside drying chambers

Research products

Selected publications

1. **A. Sampaolo**, P. Patimisco, M. Giglio, A. Zifarelli, H. Wu, L. Dong, V. Spagnolo, "Quartz-enhanced photoacoustic spectroscopy for multi-gas detection: A review", *Anal. Chim. Acta*, 2022, 1202, 338894
2. G. Menduni, A. Zifarelli, **A. Sampaolo**, P. Patimisco, M. Giglio, N. Amoroso, H. Wu, L. Dong, R. Bellotti, V. Spagnolo, "High-concentration methane and ethane QEPAS detection employing partial least squares regression to filter out energy relaxation dependence on gas matrix composition", *Photoacoustics* 26, 100349 (2022).
3. **A. Sampaolo**, C. Yu, T. Wei, A. Zifarelli, M. Giglio, P. Patimisco, Huan Zhu, Haiqing Zhu, L. He, H. Wu, L. Dong, G. Xu, V. Spagnolo, "H<sub>2</sub>S quartz-enhanced photoacoustic spectroscopy sensor employing a liquid-nitrogen-cooled THz quantum cascade laser operating in pulsed mode", *Photoacoustics* 21, 100219 (2021).
4. A. Zifarelli, M. Giglio, G. Menduni, **A. Sampaolo**, P. Patimisco, V.M.N. Passaro, H. Wu, L. Dong, and V. Spagnolo, "Partial Least-Squares Regression as a Tool to Retrieve Gas Concentrations in Mixtures Detected Using Quartz-Enhanced Photoacoustic Spectroscopy", *Anal. Chem.* 92, 11035–11043 (2020).
5. **A. Sampaolo**, G. Menduni, P. Patimisco, M. Giglio, V.M.N. Passaro, L. Dong, H. Wu, F.K. Tittel, V. Spagnolo, "Quartz-enhanced photoacoustic spectroscopy for hydrocarbon trace gas detection and petroleum exploration", *Fuel* 227, 112112 (2020).
6. A. Elefante, G. Menduni, H. Rossmadl, V. Mackowiak, M. Giglio, **A. Sampaolo**, P. Patimisco, V.M.N. Passaro, V. Spagnolo, "Environmental Monitoring of Methane with Quartz-Enhanced Photoacoustic Spectroscopy Exploiting an Electronic Hygrometer to Compensate the H<sub>2</sub>O Influence on the Sensor Signal", *Sensors* 20, 2935 (2020).
7. H. Wu, L. Dong, X. Yin, **A. Sampaolo**, P. Patimisco, W. Ma, L. Zhang, W. Yin, L. Xiao, V. Spagnolo, S. Jia, "Atmospheric CH<sub>4</sub> measurement near a landfill using an ICL-based QEPAS sensor with V-T relaxation self-calibration", *Sens. Act. B Chem.* 297, 126753 (2019).
8. **A. Sampaolo**, S. Csutak, P. Patimisco, M. Giglio, G. Menduni, V. Passaro, F.K. Tittel, M. Deffenbaugh, V. Spagnolo, "Methane, ethane and propane detection using a compact quartz enhanced photoacoustic sensors and a single interband cascade laser", *Sens. Act. B Chem.* 282, 952-960 (2019).
9. Patimisco, **A. Sampaolo**, L. Dong, F.K. Tittel, Vincenzo Spagnolo, "Recent advances in quartz enhanced photoacoustic sensing, *Appl. Phys. Rev.* 5, 011106 (2018).
10. H. Wu, **A. Sampaolo**, L. Dong, P. Patimisco, X. Liu, H. Zheng, X. Yin, W. Ma, L. Zhang, W. Yin, V. Spagnolo, S. Jia, and F.K. Tittel, "Quartz enhanced photoacoustic H<sub>2</sub>S gas sensor based on a fiber-amplifier source and a custom tuning fork with large prong spacing", *Applied Physics Letters* 107, 111104 (2015).

Co-inventor of the **US patent n° 10429350B2**, issued: 01/10/2019, title: "**Photoacoustic gas detection**".

Co-inventor of the **Chinese patent n° 202010087714.6**, issued: 10/02/2020, title: "**A method and a device for improving the sensitivity of gas concentration detection of quartz enhanced photoacoustic spectrum**".

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.

Bari, 07/08/2023

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