C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

MONDAY SEPTEMBER 15 – Morning/1

SESSION 1: Metamaterials and Metasurfaces for Spectroscopy

Session Chair: William Whelan Curtin

Time	Speaker	Presentation Title
09:00 - 09:15	**Vincenzo Spagnolo**, **Lei Dong** and **William Whelan Curtin**	Opening
09:15 - 09:45	**Carlo Sirtori (KEYNOTE)** *Ecole normale supérieure, France*	Metamaterial Enhanced Unipolar Quantum Optoelectronics
09:45 - 10:05	**Mikhail Belkin (INVITED)** *Technical University of Munich, Germany*	Tunable continuous-wave 1-11 THz light sources based on difference-frequency mixing in intersubband polaritonic metasurfaces
10:05 - 10:25	**Artem Vorobev** *Munster Technological University, Ireland*	Metasurfaces for the Mid-Infrared Spectroscopy Application
10:25 - 10:40	**Giovanni Piscopo** *Munster Technological University, Ireland*	Mid-IR Spatial Light Modulation Using Germanium Metamaterials

BRIEF Biorobotics Research & Innovation Engineering Facilities
D3-4-HEALTH FOR HEALTH Digital Driven Diagnostics, prognostics and therapeutics for sustainable Health care
EVOQUE
mcq instruments
Ministry of Foreign Affairs and International Cooperation
PolySenSe
ETG Risorse e Tecnologia
Nanosystems and Technologies GmbH nanoplus
Politecnico di Bari
UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO
chemosensors an Open Access Journal by MDPI
condensed matter an Open Access Journal by MDPI
Power INNOVATION
sensors

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

MONDAY SEPTEMBER 15 – Morning/2

SESSION 2: Novel Infrared Sources and Detectors

Session Chair: Mikhail Belkin

Time	Speaker	Presentation Title
11:00 - 11:20	**Paolo De Natale (INVITED)** *CNR, National Institute of Optics, Italy*	Shaping Photon Statistics in Mid-Infrared Cascade Lasers
11:20 - 11:35	**Raffaele De Palo** *Technical University of Bari, Italy*	Laser-textured Quartz-Tuning-Forks as infrared photodetector
11:35 - 11:50	**Aldo Pio Cantatore** *University of Bari, Italy*	Lithium Niobate Tuning Forks as piezoelectric transducers in Infrared Spectroscopy for gas sensing
11:50 - 12:05	**Afonso de Cerdeira Oliveira** *Technical University of Milano, Italy*	Ge-on-Si bias-tunable dual-band photodetector for solvent recognition
12:05 - 12:20	**Fanny Pages** *University of Montpellier, France*	New capacitive MEMS design for photoacoustic gas sensing
12:20 - 12:35	**Jacopo Pelini** *CNR, National Institute of Optics, Italy*	Exploiting unconventional silicon-based Micro-Electro-Mechanical systems for high-sensitivity cantilever-enhanced photoacoustic spectroscopy

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

MONDAY SEPTEMBER 15 – Afternoon

SESSION 3: Optical Sensing and Spectroscopy

Session Chair: Livio Gianfrani

Time	Speaker	Presentation Title
14:30 - 14:50	**Roderik Krebbers (INVITED)** *Radboud University, The Netherlands*	Spectroscopic applications of novel ultra-broadband, mid-infrared IDFG-based sources
14:50 - 15:10	**Fakun Wang (INVITED)** Nanyang Technological University, Singapore	Multidimensional optical information detection
15:10 - 15:25	**Daniele Barberio** *University of Padua, Italy*	Raman spectroscopy for Clostridia produced hydrogen detection in milk
15:25 - 15:40	**Hongming Fei** *Taiyuan University of Technology, China*	Topological ring resonator for refractive index sensing at telecommunication wavelength
15:40 - 15:55	**Emilija Petronijevic** *Sapienza University of Rome, Italy*	Photo-acoustics meets nanoplasmonics: widely tunable photo-acoustic spectroscopy on commercial nanostructured samples
15:55 - 16:10	**Clarie Birot** *ONERA, France*	Wavelength Modulation Spectroscopy for the study of nitrogen oxide concentration after electric discharges simulating lightning
15:55 - 16:10	**Xao Mao,** *Nanyang Technological University, Singapore*	Reconfiguring the Order of Exceptional Points in a Scalable High-order Anti-parity-time Symmetric System

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

TUESDAY SEPTEMBER 16 – Morning/1

SESSION 4: Advanced Spectroscopic Techniques

Session Chair: Paolo De Natale

Time	Speaker	Presentation Title
09:00 - 09:30	**Jerome Faist (KEYNOTE)** *ETH Zurich, Switzerland*	Semiconductor quantum walk combs for spectroscopy and telecommunication applications
09:30 - 09:50	**Livio Gianfrani (INVITED)** *Università of Campania, Italy*	Comb-linked cavity ring-down spectroscopy: probing ultra-weak absorption from the deep-ultraviolet to the mid-infrared
09:50 - 10:10	**Simone Borri (INVITED)** *CNR, National Institute of Optics, Italy*	Intracavity cantilever-based photoacoustic sensors: exploring unconventional regimes bringing together sensitivity and resolution
10:10 - 10:25	**Davide Pinto** *ETH Zurich, Switzerland*	Quantum Walk Comb FM Spectroscopy
10:25 - 10:40	**Lavinia Anna Mongelli** *Technical University of Bari, Italy*	Development of a novel GC-QEPAS sensing system for Volatile Organic Compounds detection

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

TUESDAY SEPTEMBER 16 – Morning/2

SESSION 5: Photothermal and Photoacoustic Spectroscopy

Session Chair: Weidong Chen

Time	Speaker	Presentation Title
11:00 - 11:20	**Wei Ren (INVITED)** *The Chinese University of Hong Kong, Hong Kong*	Dual-Comb Photothermal and Photoacoustic Spectroscopy
11:20 - 11:40	**Roberto Li Voti (INVITED)** *Sapienza University of Rome, Italy*	NDT by Photoacoustic and Photothermal Techniques: Recent Advances and Perspectives
11:40 - 12:00	**Bernhard Lendl (INVITED)** *Technical University of Wien, Austria*	Mid-IR photothermal spectroscopy for liquid sensing
12:50 - 12:20	**William Whelan Curtin (INVITED)** *Munster Technological University, Ireland*	Integrated Photothermal Spectroscopy Systems: A Path Toward Mass Production using Semiconductor Processes
12:20 - 12:35	**Thomas Strahl** *Fraunhofer Institute for Physical Measurement Techniques, Germany*	How to use a tunable laser and a gas filter cell for photoacoustic signal generation
12:35 - 12:50	**Johannes P. Waclawek** *Technical University of Wien, Austria*	Towards Photonic Integration: Trace Gas Sensing by Balanced-Detection Interferometric Cavity-Assisted Photothermal Spectroscopy (ICAPS)

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

WEDNESDAY SEPTEMBER 17 – Morning/1

SESSION 6: Bio-medical Applications - Sponsored by Project Brief

Session Chair: Marilena Giglio

Time	Speaker	Presentation Title
09:00 - 09:20	**Markus Sigrist (INVITED)** *ETH Zurich, Switzerland*	Laser-spectroscopic non-invasive glucose monitoring
09:20 - 09:40	**Jingjing Jiang (INVITED)** *University Hospital Zurich and University of Zurich, Switzerland*	Time domain near infrared spectroscopy and tomography for biomedical applications
09:40- 10:00	**Ulrike Willer (INVITED)** *Clausthal University of Technology, Germany*	Towards tactile sensing by use of a flexible polymer foil with masklessly processed waveguides
10:00 - 10:15	**Felice Alberto Sfregola** *University of Bari, Italy*	Full-Domain 3D Digital Twin for SSAW Devices: Advancing Microfluidics and Sensing for One-Health
10:15 - 10:30	**Antonio Brunetti** *Technical University of Bari, Italy*	Interpretable EEG Analysis of Neurodegenerative Diseases for Precision Medicine Applications

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

WEDNESDAY SEPTEMBER 17 – Morning/2

SESSION 7: Breath Analysis - Sponsored by Project D3-4Health

Session Chair: Vincenzo Spagnolo

Time	Speaker	Presentation Title
11:00 - 11:20	**Kiran Sankar Maiti (INVITED)** *Technical University of Munich, Germany*	Limits and prospects of infrared spectroscopy of breath for early diagnosis of asymptomatic diseases
11:20 - 11:40	**Aurore Vicet (INVITED)** *University of Montpellier, France*	Photoacoustics for breath analysis: sources and setups. Preliminary demonstration on cardiovascular diagnosis
11:40 - 12:00	**Arcangelo Picciariello (INVITED)** *University of Salento, Italy*	Diagnosis of colorectal cancer by the analysis of volatile organic compounds in the exhaled breath
12:00 - 12:15	**Nicoletta Ardito** *Technical University of Bari, Italy*	Quartz-Enhanced Photoacoustic Sensor for Real Time and In-line Detection of Methane in Exhaled Breath
12:15 - 12:30	**Abou Naoum Fadia** *University of Montpellier, France*	Development and Optimization of Photo-Acoustic sensors based on multi pass QEPAS for medical applications
12:30 - 12:45	**Lorena Nappa** *D3-4Health Foundation, Italy*	Advancing Healthcare: The Role of IR-D34Health Infrastructure

WEDNESDAY SEPTEMBER 17 – Afternoon

SESSION 8: Quartz and Cantilever-Enhanced Photoacoustic Spectroscopy

Session Chair: Simone Borri

Time	Speaker	Presentation Title
14:30 - 14:50	**Pietro Patimisco (INVITED)** *University of Bari, Italy*	Real time monitoring of N_2O and CO emissions from vehicles using a Quartz-Enhanced Photoacoustic sensor
14:50 - 15:10	**Marcus Wolff (INVITED)** *Hamburg University of Applied Sciences, Germany*	QEPAS Analyzer for Solids and Liquids
15:10 - 15:25	**Cian F. Twomey** *Munster Technological University, Ireland*	PPB-level Detection of Methane using Dielectric Coated Side-polished Fibers with Quartz-enhanced Photoacoustic Spectroscopy
15:25 - 15:40	**Marta Ruiz-Llata** *Universidad Carlos III de Madrid, Spain*	Implementation and calibration of an in-situ sensor for isotopic monitoring of atmospheric CO2 based on QEPAS
15:40 – 15:55	**Maxime Duquesnoy** *ONERA, France*	Quartz enhanced photoacoustic gas cell with optical multi-pass for detection of broad-spectrum gas molecules
15:55 - 16:10	**Oscar Bonilla** *Universidad Carlos III de Madrid, Spain*	Characterization of a Multi-Pass Circular Cell using Photoacoustic Spectroscopy

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

THURSDAY SEPTEMBER 18 – Morning/1

SESSION 9: Integrated Silicon Photonics

Session Chair: Angelo Sampaolo

Time	Speaker	Presentation Title
09:00 - 09:30	**Carlos Alonso Ramos (KEYNOTE)** *Université Paris-Saclay, France*	Subwavelength engineering of silicon photonics for nonlinear applications in the near-IR and mid-IR
09:30 - 09:50	**Delphine Marris-Morini (INVITED)** *Université Paris-Saclay, France*	Graded index Silicon-Germanium photonics circuits for the mid-infrared spectral range
09:50 - 10:10	**Goran Mashanovich (INVITED)** *University of Southampton, UK*	Silicon Photonics for mid-IR Sensing
10:10 - 10:25	**Jana Jágerská** *The Arctic University of Norway, Norway*	On-chip Waveguide Sensor Module for Precision MIR Spectroscopy
10:25 - 10:40	**Jan Viljanen** *The Arctic University of Norway, Norway*	Suspended Waveguide Enhanced Raman Spectroscopy for Trace Molecule Sensing

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

THURSDAY SEPTEMBER 18 – Morning/2

SESSION 10: Industrial Applications

Session Chair: Bela Tuzson

Time	Speaker	Presentation Title
11:00 - 11:15	**Luca Poletto** *CNR - Institute for Photonics and Nanotechnologies, Italy*	Hydrogen detection via Raman-based sensor
11:15 - 11:30	**Arianna Elefante** *CNR - Institute for Photonics and Nanotechnologies, Italy*	Real-World QEPAS Measurements in Volcanic Environments: A Case Study at the Campi Flegrei
11:30 - 11:45	**Giuseppe Canuti** *MCQ Instruments, Italy*	All-in-one Gas mixer and pressure controlling system for spectroscopy
11:45 - 12:00	**Robert Weih** *Nanoplus Nanosystems and Technologies GmbH, Germany*	Long Wavelength Cascade Laser Technology for Sensing Applications
12:00 - 12:15	**Fabrizio Manassero** *ETG Risorse e Tecnologia Srl, Italy*	TDL, ICL, QCL QEPAS gas analyser
12:15 - 12:30	**Claudio Fratini** *Roma Tre University, Italy*	Realization of an automatic waste material recognition system for waste recycling

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

FRIDAY SEPTEMBER 19 – Morning/1

SESSION 11: Sensing for Security and Food Applications - Sponsored by project EVOQUE

Session Chair: Ulrike Willer

Time	Speaker	Presentation Title
09:00 – 09:20	**Marilena Giglio (INVITED)** *Technical University of Bari, Italy*	Spectroscopic study of Volatile Organic Compounds for the assessment of coffee authenticity
09:20 - 09:35	**Yueyu Lin** *Radboud University, The Netherlands*	Time-resolved gas detection using mid-infrared upconversion spectroscopy
09:35- 09:50	**Lisa Dreier** *German Aerospace Center, Germany*	Sensitivity of a remote mid-infrared spectroscopy system for detecting traces of explosives
09:50 - 10:05	**Mariagrazia Olivieri** *Technical University of Bari, Italy*	Dual-Gas QEPAS based sensor for simultaneous detection of methane isotopologues
10:05 - 10:20	**Chaofeng Sun** *Shanxi University, China*	Multigas simultaneous detection based on photoacoustic spectroscopy technology

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

FRIDAY SEPTEMBER 19 – Morning/2

SESSION 12: Spectroscopy for air pollutants detection - Sponsored by MAECI

Session Chair: Pietro Patimisco

Time	Speaker	Presentation Title
11:00 - 11:20	**Weidong Chen (INVITED)** *Université du Littoral Côte d'Opale, France*	Remote sensing of vertical distribution of greenhouse gases in the atmospheric column using laser heterodyne radiometer
11:20 - 11:40	**Béla Tuzson (INVITED)** *Empa, Switzerland*	The Sky's the Limit: Compact Trace Gas Sensors for Airborne Explorations
11:40 - 11:55	**Hisashi Abe** *National Metrology Institute of Japan, Japan*	Laser-wavelength-tuned CRDS for real-time measurement of trace gas
11:55 - 12:10	**Tobias Dieter Schmitt** *Heidelberg University, Germany*	An open-path observatory for greenhouse gases using dual comb spectroscopy
12:10 - 12:25	**Houston Miller** *George Washington University, U.S.*	Laser Heterodyne Radiometry: Applications from Solar Occultation to Wildfire Characterization
12:25 – 12:40	**Stiefvater Gerrit** *Fraunhofer Institute for Physical Measurement Techniques, Germany*	Assessment of N_2O emissions from soil using a portable photoacoustic spectroscopy system

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

TUESDAY SEPTEMBER 16 – Afternoon

POSTER SESSION

#	Poster Presenter	Affiliation	Poster Title
1	**Carolin P. Bauer**	ETH Zurich / EMPA, Switzerland	Simple cross-comb spectroscopy with a dual-comb optical parametric oscillator and real-time coherent averaging
2	**Gabriele Biagi**	Munster Technological University, Ireland	Dual Laser diode integration in a silicon duplexer for multi-gas spectroscopy
3	**Claire Birot**	ONERA, France	Mapping of CH4 atmospheric plumes from point sources by open -path TDLAS and AI-assisted tomographic reconstruction: numerical proof of concept
4	**Oscar Bonilla**	Universidad Carlos III de Madrid, Spain	Design of a low-cost Fabry-Perot cell for Photothermal Spectroscopy
5	**Raimund Brunner**	Fraunhofer Institute for Physical Measurement Techniques, Germany	Development of an Optical pCO_2 Sensor Based on ATR for Deep Sea Applications
6	**Stefania Caragnano**	University of Bari, Italy	From Design to Device: Efficient Size-Based Separation of Particles in Spiral Microfluidic Chips
7	**Gunho Chung**	Korea Institute of Industrial Technology (KITECH), Korea	N2O Concentration Measurement Based on Multi-Absorption Spectral Signals Analysis Using End-to-End CNN Learning
8	**Maxime Duquesnoy**	ONERA, France	State-of-the-art photoacoustic gas detection adapted to nitric oxide
9	**Paola Formica**	Technical University of Bari, Italy	Partial Least Squares Regression analysis of natural gas-like mixtures using a mid-infrared supercontinuum broadband source
10	**Tecla Gabbrielli**	CNR, National Institute of Optics, Italy	Optomechanics near- to mid-infrared gate based on self-mixing interferometry

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

TUESDAY SEPTEMBER 16 – Afternoon

POSTER SESSION

#	Poster Presenter	Affiliation	Poster Title
11	**Csilla Gombi**	University of Szeged, Hungary	QCL-based ammonia detection: from laboratory to crop field
12	**Jeongwoo Ha**	Korea Institute of Industrial Technology (KITECH), Korea	Leakage Ammonia Detection Using Backscattering-Based Tunable Diode Laser Absorption Spectroscopy
13	**Lorenz Heilmann**	Empa, Switzerland	Exploring the Limits of Segmented Circular Multipass Cells
14	**Nakwon Jeong**	Korea Institute of Industrial Technology (KITECH), Korea	In-situ Diagnostics of Water Vapor and Temperature Distribution Using TDLAS in a Rotating Gliding Arc Plasma Reactor during Dry Reforming of Methane
15	**Changyeop Lee**	Korea Institute of Industrial Technology (KITECH), Korea	Precision Measurement of OH Radicals in Hydrogen-Blended Flames Using Laser Absorption Spectroscopy
16	**Hyungseok Kim**	Korea Institute of Industrial Technology (KITECH), Korea	A Study on Measurement of Methane Slip Concentration in Burn-Wet Type POU Scrubber Using TDLAS
17	**Luigi Lombardi**	Technical University of Bari, Italy	Single-board QEPAS system with an open-source FPGA
18	**Eric Maier**	University of Freiburg, Germany	Natural gas detection from an unmanned aerial vehicle (UAV) using remote and photoacoustic sensing based on tunable laser spectroscopy
19	**Xuan Mao**	Nanyang Technological University, Singapore	Reconfiguring the Order of Exceptional Points in a Scalable High-order Anti-parity-time Symmetric System

C-PASS
Conference on Photonics for Advanced Spectroscopy and Sensing

2nd CONFERENCE ON PHOTONICS FOR ADVANCED SPECTROSCOPY AND SENSING

TUESDAY SEPTEMBER 16 – Afternoon

POSTER SESSION

#	Poster Presenter	Affiliation	Poster Title
20	**Luigi Melchiorre**	Technical University of Bari, Italy	Comparative study of QEPAS and BF-QEPAS techniques for trace multi-gas detection
21	**Harald Moser**	Technical University of Wien, Austria	Comparison of an analytical fitting model for direct and indirect spectroscopy techniques
22	**Jiyeon Park**	Korea Institute of Industrial Technology (KITECH), Korea	Quantitative Analysis of OH Radical Concentration in Turbulent Co-Fired LNG-Hydrogen Flames Using Wavelength Modulation Spectroscopy
23	**Jacopo Pelini**	CNR, National Institute of Optics, Italy	Implementation of a CW QCL-based mid-Infrared LIDAR
24	**Giovanni Piscopo**	Munster Technological University, Ireland	An All-Silicon Metalens operating in the Mid-IR
25	**Mario Siciliani de Cumis**	Italian Space Agency, Italy	A portable Carbonyl Sulfide laser spectrometer at 4.8 μm for environmental monitoring
26	**Joonmo Son**	Korea Institute of Industrial Technology (KITECH), Korea	TDLAS-Based Tomographic Analysis on OH Radical Distributions in Premixed Flames with irregular Structures
27	**Aran Song**	Korea Institute of Industrial Technology (KITECH), Korea	Development of Calibration-free Wavelength Modulation Spectroscopy for Precise Measurement of HF, HCl, and NH3 Emissions in the Semiconductor Industry
28	**Silvano Spagnolo**	Polysense Innovations s.r.l., Italy	GC-MS-Based Breath Analysis for Early Detection of Colorectal Cancer: A Non-Invasive Diagnostic Approach
29	**Daphne Spagnolo**	Polysense Innovations s.r.l., Italy	ATR-FTIR Spectroscopy of Blood Serum for Early, Non-Invasive Detection of Gastrointestinal Cancers

TUESDAY SEPTEMBER 16 – Afternoon

POSTER SESSION

#	Poster Presenter	Affiliation	Poster Title
30	**Bo Sun**	Taiyuan University of Technology, China	Advanced Spectroscopic Approaches for Trace Gas Detection in Challenging Matrices
31	**Panna Végh**	University of Szeged, Hungary	Photoacoustic instruments for the detection and localization of leaks in refrigeration systems
32	**Alex Weitnauer**	Empa, Switzerland	ASPIRE: An airborne QCLAS for atmospheric water vapor isotopologues measurements
33	**Vincenzina Zecchino**	Technical University of Bari, Italy	Quartz Tuning Fork Front-end Circuits and Optimal Laser Modulation Frequency in QEPAS Sensors