ICOP 2022

Italian Conference on Optics and Photonics

Trento, June 15-17, 2022

PROGRAM

Organizers

Sponsored by

15TH JUNE

09.00 – 13.00	**Registration**
10.30 – 11.00	**Opening**
11.00 – 12.30	Plenary session: **Photonics in the PNRR (MUR)**

12:30 - 14:30 LUNCH BREAK

14.30 – 16.00	Parallel Sessions: **Quantum Photonics** **Special Fibers Exploitation for TLC** **Optical Imaging and Sensing: Novel Approaches**

16:00 - 16:30 COFFEE BREAK

16.30 – 18.15	Parallel Sessions: **Emerging technologies** **Laser and NL optics** **Biophotonics**

16TH JUNE

09.00 – 10.30	Plenary Session Session Chair: To be defined P.1 **Intra membrane molecular opto transducers for bio-hybrid systems and human-machine symbiosis** Guglielmo Lanzani P.2 **…** …

10:30 - 11:00 COFFEE BREAK

11.00 – 12.30	Parallel Sessions: **Optical Networks and TLC Systems** **Nanomaterials and Nanotechnology in Optical Sensing** **Applications of Photonics Technology**

12:30 - 14:30 LUNCH BREAK

14.30 – 16.00	Parallel Sessions: **Photonic Devices and Integrated Circuits** **Deep learning and processing for TLC** **Optical Fibre Sensors**

16:00 - 16:30 COFFEE BREAK

16.30 – 18.00	**Poster Section**

18.30 - 22:30 SOCIAL EVENT (MUSE)

18.30 – 22.30	**MUSE Tour** **Social Dinner** **Show: Medicine of the Future** Andrea Brunello (Compagnia Arditodesìo | Jet Propulsion Theatre)

17TH JUNE

09.00 – 10.30	Plenary Session **Photonics in Europe** Session Chair: Luca Mion (HIT) P.3 **Photonics 21** Sebastien Bigo (Nokia Bell Labs) P.4 **Photonics within the European Horizon program** Stefano Selleri (DG connect) P.5 **PhotonHub Europe** Hugo Thienpont (UV Bruxel)

10:30 - 10:50 COFFEE BREAK

10.50 – 11.25	Plenary Session **PhotonSTART –Photonic Innovation lead by Italian Sartup** Session Chair: Marco Senigalliesi (HIT) **Pitches by photonics Italian startups**
11.25 – 12.40	Plenary Session **Italian Photonics Initiatives** Session Chair: Luca Mion (HIT) **Experience in Lombardia** Andrea Meloni (PoliMi) **Experience in Tuscany** Roberto Pini (distretto toscano GATE 4.0) **Experience in Campania** tbd
12.40 – 13.00	**Plenary Session** Award Ceremony and closings

Parallel Sessions

QUANTUM PHOTONICS

15TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.01	**POLIQI: Milano Quantum Infrastructure** Mario Martinelli
15.00 - 15.15	O.01	**Expanding the information content of spin-to-orbit conversion by means of a photonic crystal slab supporting bound states in the continuum** Edoardo De Tommasi
15.15 - 15.30	O.02	**Generation of single-photon entangled states with a Silicon oxynitride integrated photonic chip** Nicolò Leone
15.30 - 15.45	O.03	**Coexistence of QKD and production channels in a deployed WDM network** Alberto Gatto
15.45 - 16.00	O.04	**An entangled photons source in the silicon platform for Mid-infrared Ghost spectroscopy** Matteo Sanna

SPECIAL FIBERS EXPLOITATION FOR TLC

15TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.02	**MIMO-free transmission system exploiting mode group division multiplexing in FMF** Alberto Gatto
15.00 - 15.15	O.05	**MMF-based data center interconnect using commercial coherent transceiver** Roberto Gaudino
15.15 - 15.30	O.06	**Forward Raman amplification in few-mode fibers with modal coupling due to stress birefringence and core ellipticity** Marco Santagiustina

15.30 - 15.45	O.07	**On the interplay between cross-phase modulation and spatial mode dispersion** Chiara Lasagni
15.45 - 16.00	O.08	**Backscattering coefficient measurement in Hollow Core Inhibited Coupling Fibers** Federico Melli

OPTICAL IMAGING AND SENSING: NOVEL APPROACHES

15TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.03	**Label-free biosensing by topological light confinement** Silvia Romano
15.00 - 15.15	O.09	**Gold nanorods and machine learning for paper-based genetic assays** Claudia Borri
15.15 - 15.30	O.10	**Towards the realisation of an integrated Exceptional Point Sensor** Riccardo Franchi
15.30 - 15.45	O.11	**Multiphoton Microscopy: a new tool for drug delivery applications and polymer science** Cristina Sissa
15.45 - 16.00	O.12	**A Machine Learning approach to the classification of chemo-structural determinants in label-free SERS detection of proteins** Andrea Barucci

EMERGING TECHNOLOGIES

15TH JUNE 16.30 – 18.15 SESSION CHAIR: TO BE DEFINED

16.30 - 17.00	I.04	**Leveraging Lithium Niobate on Insulator Technology for Photonic Analog Computing** Lorenzo De Marinis
17.00 - 17.15	O.13	**On the interplay between strain and temperature in germanium microstructures** Costanza L. Manganelli
17.15 - 17.30	O.14	**Optical nanocavity enabling hyper resolution in 2D and 3D two photon direct writing lithography** Giuseppe E. Lio
17.30 - 17.45	O.15	**Low-phase noise frequency-stabilized laser against a fiber Fabry-Pérot cavity**

		Francesco Canella
17.45 - 18.00	O.16	**Plasmonic-based nanodevice to induce effective thrust on nanoparticle**
		Sergio Balestrieri
18.00 - 18.15	O.17	**Soliton Channels in Space-Division Multiplexed Systems**
		Mario Zitelli

LASER AND NL OPTICS

15TH JUNE 16.30 – 18.15 SESSION CHAIR: TO BE DEFINED

16.30 - 17.00	I.05	**Lanthanide-Doped Nanocrystals-Engineered Photonic Crystal Metasurface Allows Massive Radiance Enhancement of Upconversion Luminescence via Strongly-Coupled Bound States in the Continuum**
		Chiara Schiattarella
17.00 - 17.15	O.18	**A Compact Terahertz Time-Domain Spectrometer**
		Jacopo Manzolli
17.15 - 17.30	O.19	**Thermodynamics of Fiber Optics: Thermalization of Multimode Beams**
		Fabio Mangini
17.30 - 17.45	O.20	**Experimental study of coupling between multimode/singlemode Vertical Cavity Surface Emitting Lasers and Standard G.652 fiber for future green Radio-over-Fiber Infrastructures**
		Jacopo Nanni
17.45 - 18.00	O.21	**Fiber Optics in The Multiphoton Ionization Regime**
		Mario Ferraro
18.00 - 18.15	O.22	**Multimode soliton interactions in GRIN fibers**
		Yifan Sun

BIOPHOTONICS

15TH JUNE 16.30 – 18.15 SESSION CHAIR: TO BE DEFINED

16.30 - 17.00	I.06	**Development of two platforms for single cell optogenetics on in-vitro neuronal cultures**
		Clara Zaccaria
17.00 - 17.15	O.23	**Towards continuous near-patient therapeutic drug monitoring by an integrated optical device**

		Francesco Baldini
17.15 - 17.30	O.24	**Plasmonic sensor for the determination of SARS-CoV-2 exploiting molecularly imprinted polymers** Chiara Perri
17.30 - 17.45	O.25	**Functionalization of a Surface-Enhanced Raman Scattering substrate in a microfluidic chip for biochemical detection** Federica Granata
17.45 - 18.00	O.26	**Application of Surface-Enhanced Raman Spectroscopy for the detection of miRNA-based cancer biomarkers** Annamaria Cucinotta (Aizhan Issatayeva)
18.00 - 18.15	O.27	**Silicon-On-Insulator 1.3µm-Wavelength Optical Phased Array for Optical Coherence Tomography applications** Manuel Reza

OPTICAL NETWORKS AND TLC SYSTEMS

16TH JUNE 11.00 – 12.30 SESSION CHAIR: TO BE DEFINED

11.00 - 11.30	I.07	**Terabit direct-detection optical engines and switching circuits in multi-chip modules for Data-center networks and the 5G optical fronthaul** Annachiara Pagano
11.30 - 11.45	O.28	**Applicability of a new generation of photonic devices in backbone network scenarios** Anna Chiadò Piat
11.45 - 12.00	O.29	**Coexistence of VCSEL-based DMT transmission and standard OTN channels in the metropolitan area network scenario** Paola Parolari
12.00 - 12.15	O.30	**Optimization of 50G-PON APD-based receivers** Leonardo Minelli
12.15 - 12.30	O.31	**FTTH Optical Networks: Construction of infrastructures and evolution of optical cables** Massimo Tarsi

NANOMATERIALS AND NANOTECHNOLOGY IN OPTICAL SENSING

16TH JUNE 11.00 – 12.30 SESSION CHAIR: TO BE DEFINED

11.00 - 11.30	I.08	**SERS detection of polyciclic aromatic hydrocarbons using coral-like nanostructured Ag-films** Angela Capaccio
11.30 - 11.45	O.32	**Hydrogel-based Plasmonic Nanocomposites for Biochemical Sensing** Bruno Miranda
11.45 - 12.00	O.33	**Hydrogel doped by silver nanoparticles: employment in environmental remediation** Luca Burratti
12.00 - 12.15	O.34	**Polymer-based Nanoplasmonic Chemical Sensors and Biosensors** Francesco Arcadio
12.15 - 12.30	O.35	**Nanofabrication of smart plasmonic transducers for biosensing purposes** Maria Grazia Manera

APPLICATIONS OF PHOTONICS TECHNOLOGY

16TH JUNE 11.00 – 12.30 SESSION CHAIR: TO BE DEFINED

11.00 - 11.30	I.09	**All-glass flexible 1D photonic crystals fabricated via RF-sputtering as dichroic mirrors** Alice Carlotto
11.30 - 11.45	O.36	**Integrated optofluidic Fabry-Perot resonator for sensing applications** Romeo Bernini
11.45 - 12.00	O.37	**Reservoir computing with a single microring: isolated response to nonlinear and memory tasks** Davide Bazzanella
12.00 - 12.15	O.38	**Light at work at nanoscale: Tip-Enhanced Raman Spectroscopy** Giulia Rusciano
12.15 - 12.30	O.39	**Organic light emitting devices (OLED): a playground for multidisciplinary research** Anna Painelli

PHOTONIC DEVICES AND INTEGRATED CIRCUITS

16TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.10	**Low Noise 2.6 to 26 GHz Tenfold Frequency Multiplication by an InP Optical Comb** Giampiero Contestabile
15.00 - 15.15	O.40	**Commuted Mode SiGe Phototransistors for Time Modulated Array Applications** Andrea Giovannini
15.15 - 15.30	O.41	**On-chip wireless interconnection through reconfigurable optical phased arrays** Gaetano Bellanca
15.30 - 15.45	O.42	**Monitoring Visible Light in Silicon Nitride Waveguides** Christian De Vita
15.45 - 16.00	O.43	**Mitigating Polarization Rotation Effects in Thin-Film Lithium Niobate Waveguides** Gabriele Cavicchioli

DEEP LEARNING AND PROCESSING FOR TLC

16TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.11	**Deep learning-based Phase Retrieval Scheme for Minimum Phase Signal Recovery** Daniele Orsuti
15.00 - 15.15	O.44	**End-to-end Deep Learning for VCSEL's Nonlinear Digital Pre-Distortion** Leonardo Minelli
15.15 - 15.30	O.45	**Deep Learning Regression vs. Classification for QoT Estimation in SMF and FMF Links** Andrea Carena
15.30 - 15.45	O.46	**Solitonic neuromorphic hardware for pattern recognition and memorization** Alessandro Bile
15.45 - 16.00	O.47	**Chaotic lasers provide physical unclonable functions for network authentication** Lorenzo Lombardi

OPTICAL FIBRE SENSORS

16TH JUNE 14.30 – 16.00 SESSION CHAIR: TO BE DEFINED

14.30 - 15.00	I.12	**Unconventional optical fibers for biosensing** Sara Tombelli
15.00 - 15.15	O.48	**A microstructured fiber for Streptavidin detection** Foroogh Khozeymeh
15.15 - 15.30	O.49	**Toward the Development of Optical fibre-based Dosimeters and Radiation Sensors** Aurora Bellone
15.30 - 15.45	O.50	**Higher-order mode optical fiber tapers for refractive index sensing based on Brillouin scattering** Ester Catalano
15.45 - 16.00	O.51	**Evaluation of strain sensing cables for Brillouin optical time domain analysis through Swept Wavelength Interferometry** Gabriele Bolognini

POSTER SESSION

16TH JUNE 16.30 – 18.00

16.30 - 18.00	PS.01	**Novel generation schemes for stable soliton states in optical microcavities** Francesco Rinaldo Talenti
	PS.02	**Design of a Ho:Nd-codoped fluoroindate fiber for Mid-IR laser emission** Antonella Maria Loconsole
	PS.03	**Design of an erbium-doped fluoroindate fiber laser pumped at 635 nm** Mario Christian Falconi
	PS.04	**Numerical analysis of a 16-core fiber for high power applications** Seyyedhossein Mckee
	PS.05	**Optical bench for multi-lane high-rate transceiver testing** Annachiara Pagano
	PS.06	**Plasmonic metastructures tailored to stimulate high local heating** Giuseppe E. Lio
	PS.07	**Surface-enhanced Raman spectroscopy (SERS) for sensitive determination of catechol moieties fraction in chamomile extract** Chiara Amicucci
	PS.08	**Innovative optical system for online monitoring sag, rotation and ice accretion for AT and AAT lines** Elena Golinelli

PS.09 **Optical Voltage Sensor for Embedded operation in equipment of Medium Voltage network under different environmental condition**

Letizia De Maria

PS.10 **UV-C LED sources design and characterization**

Sarah Bollanti

PS.11 **Single silicon microring resonator for time delay reservoir computing: from theory to preliminary experimental results**

Giovanni Donati

PS.12 **The influence of photoinitiator concentration on the two-photon polymerization threshold of pentaerythritol triacrylate (PETIA) monomer**

Seyyedhossein Mckee

PS.13 **Fiber-based Microwave Interferometer for monitoring the fiber-induced delay of antenna downlink in radioastronomic scenarios**

Jacopo Nanni

PS.14 **The analysis and design of a Variational Quantum Eigensolver on a silicon photonics chip**

Alessio Baldazzi

PS.15 **QUANTEP: the QUANtum Technologies Experimental Platform**

Andrea Salamon

PS.16 **Raman Efficiency estimation for integrated quantum-classical communication systems**

Alessandro Gagliano

PS.17 **Transverse roughness effects on loss and modal content in hollow-core tube lattice fibers**

Federico Melli

PS.18 **Conventional and un-conventional lithographic techniques for high precision nano-device manufacturing**

Adriano Colombelli

PS.19 **Direct writing femtosecond-pulse fiber Bragg gratings for sensing and laser applications**

Martha Segura

PS.20 **2-FAL sensor system for industrial application**

Letizia De Maria

PS.21 **Experimental Evaluation of the Birefringence Effect on Fiber Optic Current Sensors**

Andrea Madaschi

PS.22 **A Raman spectroscopy ex vivo study of the potential role of Er:YAG laser and fluoride in the dental enamel remineralization**

Annamaria Cucinotta (Aizhan Issatayeva)

PS.23 **Hybrid Strain Sensors based on Hydrogel Plasmonic Nanocomposites**

Bruno Miranda

PS.24 **Linewidth narrowing and stabilization from a short cavity Brillouin ring laser source design for fiber sensing applications**

Leonardo Rossi

PS.25 **Analysis of a silicon subwavelength grating ring resonator as a refractometric sensor**

Foroogh Khozeymeh

PS.26 **Optoelectronics on fiber: towards all-in-fiber autonomous optrodes**

A. Ricciardi

PS.27 **Multifunctional lab-on-fiber smart cavity for biochemical sensing**

M. Giaquinto

PS.28 **Hierarchical binary structures as SERS-active substrates**

M. A. Cutolo, G. Quero, V. Calcagno, S. Spaziani, F. Galeotti, M. Pisco, A. Irace, G. Breglio, A. Cusano

PS.29 **Towards Advanced Lab-on-Fiber Optrodes based on All-Dielectric Fluorescence Enhancing Metasurfaces**

Hiba Alhalaby

PS.30 **Machine-learning assisted OFDR-based acoustic distributed sensing for restoration of information lost at fading point**

Arman Aitkulov

PS.31 **Photon harvesting in large-area flat-optics nanoarrays**

G. Ferrando, M. Barelli, M.C. Giordano, M.Gardella, D. Chowdhury, F. Buatier de Mongeot

PS.32 **Near-field spectroscopy investigation of the strong coupling between an infrared nanoantenna and a semiconductor quantum well**

S.Sotgiu, M. Malerba, A. Schirato, L. Baldassarre, R. Gilibert, V.Giliberti, M.Jeannin, J-M. Manceau, L. Li, A.G. Davies, E.H. Linfield, A. Alabastri, M. Ortolani, R. Colombelli

PS.33 **Tailored Epsilon Near Zero Metamaterials for Hyper Resolute Direct Laser Writing**

G.E.Lio, A. De Luca, M. Giocondo , R. Caputo