

2023 IEEE Photonics Conference (IPC 2023)

**Orlando, Florida, USA
12-16 November 2023**



**IEEE Catalog Number: CFP23LEO-POD
ISBN: 979-8-3503-4723-4**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23LEO-POD
ISBN (Print-On-Demand):	979-8-3503-4723-4
ISBN (Online):	979-8-3503-4722-7
ISSN:	2374-0140

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Experimental Demonstration of Online Learning in Deep Photonic Neural Networks.....	1
<i>Xi Li, Disha Biswas, Peng Zhou, Wesley H. Brigner, Joseph S. Friedman, Qing Gu</i>	
Inverse Design of Silicon Photonics Components: A Study from Deep Learning Perspective	3
<i>Mohammad Jobayer Hossain, David Reitano, Adnan Siraj Rakin</i>	
Bilayer Silicon Nitride Based On-Chip Polarization Rotator for O-band Photonic Applications	5
<i>Mohammad Jobayer Hossain, Mohammad Rakib Uddin, Lewis G. Carpenter, Amit Dikshit, Jin Wallner, Javery A. Mann, Nicholas M. Fahrenkopf, David L. Harame</i>	
Compact Modeling of Key Passive Silicon Photonic Components for a Process Design Kit	7
<i>Mohammad Jobayer Hossain, Amit Dikshit, Jin Wallner, Mohammad Rakib Uddin, Yukta Timalcina, Lewis G. Carpenter, Javery Mann, Nicholas M. Fahrenkopf, David L. Harame</i>	
Effect of the Forming Gas Annealing on the Zinc Gallium Oxide Based Deep UV Photodetector Characteristics Grown by Metalorganic Chemical Vapor Deposition	9
<i>Siddharth Rana, Fu-Gow Tarntair, Jitendra Pratap Singh, Ray-Hua Horng</i>	
Design of Frequency Diverse Array Using Two Coherent Electro-Optic Frequency Combs.....	11
<i>Youngseok Bae, Sungjun Yoo, Seungbae Ahn, Sanghoon Jin, Inguen Lee, Yoonsun Choi, Jinwoo Shin</i>	
Spectropolarimetric Characterization of Vortex Optics	13
<i>Ella E. James, Don A. Gregory</i>	
Estimation of Spectral Spacing in Gridless Nyquist-WDM Systems Using Fuzzy Clustering and Deep Learning	15
<i>C. A. Montoya Ocampo, J. J. Granada Torres</i>	
Manufacturing of Cylindrical-Shaped CVD-SiC Mold Material for High-resolution Glass Lens	17
<i>T. Kumagai, T. Furuki, H. Suzuki, T. Fukuda, K. Fujii, Y. Ito</i>	
All-Optical High Performance Microwave Oscillator with Enhanced Modulation Efficiency Based on SOAs	19
<i>Yali Huang, Xiang Zhu, Xianbin Yu</i>	
Rational Selection of Metal Subwavelength Apertures for Sensing Aerosol Nanoparticles.....	21
<i>Sophia Judge, Hao Jiang</i>	
Wide-Bandwidth Photonic Assisted–RF Signal Measurement System for High-Power RF Sources.....	23
<i>Ingeun Lee, Yoon Seon Choi, Sungjun Yoo, Jinwoo Shin, Youngseok Bae</i>	
Enhancing Low Light Images with VEVid Algorithm Using Optical Systems Acceleration (ENVICE).....	25
<i>Zibo Hu, Haoyan Kang, Yiming Zhou, Jiachi Ye, Hamed Dalir, Bahram Jalali, Volker Sorger</i>	
Experimental Generation of Concentric Vortex Beams with Independent Topological Charges.....	27
<i>F. M. Muñoz-Pérez, V. Ferrando, W. D. Furlan, J. C. Castro-Palacio, J. R. Arias-Gonzalez, J. A. Monsoriu</i>	
Optimization of UV LED Design Using Evolutionary Algorithms	29
<i>L. Leguay, H. Maczko, A. Schliwa, S. Birner</i>	

Enhanced Photon Absorption in Subwavelength Mercury Cadmium Telluride Layer for Infrared Detectors Operating at Higher Temperature	31
<i>Md. Sojib, R. Sayeed, V. Avrutin, Ü. Özgür, N. K. Dhar</i>	
Multi-Step Pulse Conversion for Temporal Mode (De)Multiplexing	33
<i>S. Behzadfar, A. Fardoost, S. Smith-Dryden, G. Li</i>	
Imaging Window Optimization for Reflection-Mode Continuous-Wave Terahertz Imaging	35
<i>A. M. Marn, N. Arduino, M. Raley, P. Maguire</i>	
Synthesis and Properties of Ge-Based Metal Halide Perovskites for Sustainable Optoelectronic Devices	37
<i>Yang Yue, Hongyang Zhu, Saroj Thapa, Deverneton Saint Paul, Peifen Zhu</i>	
Impact of Epitaxial Oxygen on High Power Diode Performance	39
<i>E. McVay, R. J. Deri, S. Baxamusa, W. E. Fenwick, M. C. Boisselle, J. Li, J. Varley, R. B. Swertfeger, L. Gilmore, M. Crowley, P. Thiagarajan, J. Song, G. Thaler</i>	
Plug and Play Measurement Device Independent Quantum Secure Communication	41
<i>Anuj Sethia, Jordan Smith, Hanen Chenini, Ashutosh Singh, Amir Ahadi, Nick Kuzmin, Daniel Oblak</i>	
On the Characterization of PDL Distribution in Wavelength Selective Switches	43
<i>Giacomo Borraccini, Andrea D'Amico, Stefano Straullu, Francesco Aquilino, Stefano Piciaccia, Alberto Tanzi, Gabriele Galimberti, Vittorio Curri</i>	
Rapid Quantification of Nitrate in Murashige-Skoog (MS) Media Using Spontaneous Raman Spectroscopy	45
<i>Dipankar Sen, Ze-Tian Fang, Alma Fernández, Brian Henrich, Alexei V. Sokolov, Sakiko Okumoto, Aart J. Verhoef</i>	
High-Order Harmonic Generation from the Van Der Waals Layered Heterostructure Copper Indium Thiophosphate	47
<i>Aamir Mushtaq, Troie Journigan, Ryan Siebenaller, Chau Truong, Mohamed Yaseen Noor, Dipendra Khatri, Michael A. Susner, Enam Chowdhury, Michael Chini</i>	
Investigation on Étendue Expansion Property of the Lenslet Array with Converging Axes	49
<i>Minseok Chae, Chun Chen, Eunbi Lee, Yoonchan Jeong, ByoungHo Lee</i>	
Novel Lambert W-Kink Solitons in AC-Driven Non-Centrosymmetric Waveguides	51
<i>Sanjana Bhatia, C. N. Kumar</i>	
An All-Optical Neuron for Scaling Integrated Photonic Neural Networks	53
<i>Md Saiful Islam Sumon, Mihai Crisan, Weicheng You, Shrivatch Sankar, Imad I. Faruque, Sarvagya Dwivedi, Shamsul Arafin</i>	
Speckle Reduced Multi-Depth Hologram Generation Using an Optimized Rotating Mask	55
<i>Eunbi Lee, Youngjin Jo, Siwoo Lee, Yoonchan Jeong, ByoungHo Lee</i>	
Programmable Multiband Microwave Photonic Filters Based on Optical Frequency Comb with Varying the Gaussian Window	57
<i>Youngjin Jung, Minje Song, Hyunjong Choi, Taehyun Lee, Gyudong Choi, Minhyup Song</i>	
Experimental Demonstration of a Non-Mode Selective MPLC (de)Multiplexer	59
<i>Shree R. Thapa, Seth Smith-Dryden, Zheyuan Zhu, Sean Pang, Guifang Li</i>	

Mode Group Division Multiplexing Communication Using Graded-Index Plastic Optical Fiber	61
<i>Yuichiro Takimoto, Koichi Takiguchi</i>	
Enhanced Mode-Coupling: A Multi-mode Hollow-Core Anti-resonant Fiber Design	63
<i>Md Selim Habib</i>	
Polarization-Mode Dispersion of Different Core Types in Heterogeneous Multi-Core Fibers	65
<i>G. Ocampo, T. Sato, Y. Amma, K. Saitoh</i>	
Digital Signal Processing for 1.6 Tb/s+ Intra-Deta Center Networks	67
<i>S. Pachnicke, S. Oettinghaus, S. Calabrò, T. Wettlin, N. Stojanovic, T. Rahman</i>	
Detection of a 624 GHz, QPSK, 1.2 Tbit/s Rectangular Bandwidth Channel with 4 GHz Electronics.....	69
<i>Abhinand Venugopalan, Paulomi Mandal, Janosch Meier, Karanveer Singh, Thomas Schneider</i>	
Enhanced Physical-Layer Security in Visible Light Communications – a Joint Waveform Approach.....	71
<i>Jan Mietzner, Lutz Lampe, Robert Schober</i>	
Decision Trees-Based Demodulation in Gridless Nyquist-WDM Systems to Minimize ICI Effects	73
<i>Kevin D. Martinez Zapata, Jhon J. Granada Torres</i>	
Staircase Avalanche Photodiode with a Mid-Wave Infrared Absorber	75
<i>Adam A. Dadey, Andrew H. Jones, Stephen D. March, Seth R. Bank, Joe C. Campbell</i>	
Defect Spectroscopy of MBE-Grown GaAs _{0.51} Sb _{0.49} Pin Infrared Detectors on InP Substrates	77
<i>Rachel L. Adams, Hyemin Jung, Nathan Gajowski, Seunghyun Lee, Sanjay Krishna, Steven A. Ringel</i>	
Low-Noise InGaAs/AlInAsSb Avalanche Photodiodes on InP Substrates	79
<i>Bingtian Guo, Mariah Schwartz, Sri H. Kodati, Kyle M. McNicholas, Hyemin Jung, Seunghyun Lee, Jason Konowitch, Dekang Chen, Junwu Bai, Xiangwen Guo, Theodore J. Ronningen, Christoph H. Grein, Joe C. Campbell, Sanjay Krishna</i>	
Precise Control of Charge Carriers in Gallium Nitride Nanowires for Emerging Photodetectors.....	81
<i>Shi Fang, Danhao Wang, Yang Kang, Wei Chen, Haiding Sun</i>	
Online Training and Pruning of Photonic Neural Networks.....	83
<i>Weipeng Zhang, Tengji Xu, Jiawei Zhang, Bhavin J. Shastri, Chaoran Huang, Paul Prucnal</i>	
Physics-Informed Mode Decomposition Neural Network for Structured Light in Multimode Fibers	85
<i>Qian Zhang, Yuan Sui, Stefan Rothe, Jürgen Czarske</i>	
Noise Aware Design Enables Robust Diffractive Deep Neural Network Designs in Visible Wavelengths	87
<i>R. Hettiarachchi, H. Kariyawasam, D. Wadduwage</i>	
Complex-Valued Optical Neural Networks Enabled by Multimode Interferometers and Phase Shifters	89
<i>Weiwei Pan, Wanshu Xiong, Zhangwan Peng, Ruoyun Yao, Jinhua Chen, Chen Ji</i>	
Ultra-Bright Source of Coherent Single Photons	91
<i>A. Javadi, N. Tamm, N. Antoniadis, A. Korsch, D. Najer, M. C. Löbl, R. Schott, S. R. Valentin, A. D. Wieck, A. Ludwig, R. J. Warburton</i>	
Towards Mode-Division-Multiplexed Optical Fiber Communications Using Silicon Photonics.....	93
<i>Dan Yi, Xuotong Zhou, Hon Ki Tsang</i>	

Topology Optimized Integrated SiN Mode Converters	95
<i>Michael J. Probst, Alec M. Hammond, Stephen E. Ralph</i>	
Machine Learning Enabled the Design of Compact and Efficient Wavelength Demultiplexing Photonic Devices	97
<i>M. Turduev, E. Bor, O. Alparslan, Y. S. Hanay, H. Kurt, S. Arakawa, M. Murata</i>	
Ultra-Broadband Four-mode Waveguide Crossing Via Inverse Design Method	99
<i>Jinhua Chen, Weiwei Pan, Chen Ji</i>	
Synergistic Use of AI and Physics Models in Planning and Controlling Multi-Band Optical Networks	101
<i>Vittorio Curri</i>	
Experimental Test of a UWB Closed-Form EGN Model	103
<i>Yanchao Jiang, Gabriella Bosco, Antonino Nespola, Alberto Tanzi, Stefano Piciaccia, Mahdi Ranjbar Zefreh, Fabrizio Forghieri, Pierluigi Poggiolini</i>	
DNN-Based QoT Estimation Using Topological Inputs and Training with Synthetic-Physical Data	105
<i>Kayol S. Mayer, Luan C. M. Dos Santos, Rossano P. Pinto, Marcos P. A. Dal Maso, Christian E. Rothenberg, Dalton S. Arantes, Darli A. A. Mello</i>	
High-Wall-plug-efficiency InP-based Photonic-crystal Surface-emitting Lasers with Reflective Metal Mirror	107
<i>Y. Itoh, T. Aoki, K. Takada, K. Fujii, H. Yoshinaga, N. Fujiwara, M. Ogasawara, R. Tanaka, H. Yagi, M. Yanagisawa, M. Yoshida, T. Inoue, M. D. Zoysa, K. Ishizaki, S. Noda</i>	
Free Space Emission Spectra and Bandwidths of Vertical Cavity Surface Emitting Lasers (VCSELs) for Optical Wireless Communication	109
<i>N. Haghighi, P. Emtenani, M. Zorn, J. A. Lott</i>	
Frequency Response Characteristics of High-Power Photonic Crystal Surface-Emitting Lasers	111
<i>Mingsen Pan, Chhabindra Gautam, Akhil Kalapala, Yudong Chen, Thomas Rotter, Ming Zhou, Ricky Gibson, Robert Bedford, Shanhui Fan, Ganesh Balakrishnan, Weidong Zhou</i>	
Edge-Mode Lasing from a non-Hermitian Topological Bulk	113
<i>Dayang Lin, Zhitong Li, Xi-Wang Luo, Abouzar Gharajeh, Jiyoung Moon, Junpeng Hou, Chuanwei Zhang, Qing Gu</i>	
High-Speed VCSELs in the 650-nm Transmission Window of Polymer Optical Fibers	115
<i>Nawal Almaymoni, Omar Alkhazragi, Fabian Finkbeiner, Tien Khee Ng, Boon S. Ooi</i>	
Plasmonic Rainbow Chip for Super-Resolution Displacement Spectrometer and Surface Biosensor	117
<i>Lyu Zhou, Nan Zhang, Chang Chieh Hsu, Matthew Singer, Xie Zeng, Yizheng Li, Haomin Song, Josep Jornet, Yun Wu, Qiaoqiang Gan</i>	
Intersubband Cavity Polaritons in Single Quantum Well Systems on Flexible Substrate	119
<i>Puspita Paul, Sadhvikas J. Addamane, Peter Q. Liu</i>	
Metacrystal Structured Illumination Microscopy	121
<i>J. Haug, M. Palei, J. ShROUT, E. Narimanov, P. Bohn, A. J. Hoffman</i>	
High Speed Single Pixel Imaging with Advanced microLED Digital Light Projector	123
<i>G. E. Johnstone, S. Bennett, P. Murray, F. Dehkhoda, R. K. Henderson, J. Herrnsdorf, M. D. Dawson, M. J. Strain</i>	

Voronoi Weighting for Optical Diffraction Tomography Using Nonuniform Illumination Angles	125
<i>John A. B. Aziz, Seth Smith-Dryden, Guifang Li, Bahaa E. A. Saleh</i>	
Binary Grating and Deep Learning for Phase Reconstruction: Enhancing Normal Camera Imaging.....	127
<i>Redha H. Al Ibrahim, Shuiqin Zheng, Tien Khee Ng, Boon S. Ooi</i>	
Fully Integrated Photonic Tensor Core for Neural Network Applications.....	129
<i>X. Ma, R. L. T. Schwartz, B. Jahannia, B. Movahhed Nouri, H. Dalir, B. J. Shastri, N. Peserico, V. J. Sorger</i>	
Loss-Induced Transparency Based ITO Monolithic Modulator in Integrated Photonics	131
<i>Chandraman Patil, Hamed Dalir, Hao Wang, Volker J. Sorger</i>	
Compact and Low-Loss PCM-based Silicon Photonic MZIs for Photonic Neural Networks.....	133
<i>Amin Shafiee, Sanmitra Banerjee, Benoit Charbonnier, Sudeep Pasricha, Mahdi Nikdast</i>	
On-Chip Nonlinear Activation and Gradient Functions for Photonic Backpropagation Training and Inference.....	135
<i>F. Ashtiani, M. H. Idjadi</i>	
Dual-Functional Intelligent Spectrometer Using a Plasmonic Rainbow Chip.....	137
<i>Dylan Tua, Ruiying Liu, Wenhong Yang, Lyu Zhou, Haomin Song, Leslie Ying, Qiaoqiang Gan</i>	
Spanning the Green Gap Through On-Chip Kerr Optical Parametric Oscillation.....	139
<i>Yi Sun, Jordan Stone, Xiyuan Lu, Kartik Srinivasan</i>	
Singly-Resonant Four-Wave Mixing Based onanOn-Chip Fabry-Perot Bragg Grating Cavity	141
<i>Chaochao Ye, Yang Liu, Chanju Kim, Kresten Yvind, Minhao Pu</i>	
Theoretical Design for Broadband Parametric Amplification in Thin Film Lithium Niobate	143
<i>Pragati Aashna, Hong-Lin Lin, El Hadj Dogheche, Giacomo Benvenuti, Thanh N. K. Bui, Aaron J. Danner</i>	
Widely Tunable Frequency Conversion with Self-Pumped Bragg Reflection Photonic Crystal Lasers	145
<i>B. Janjua, Zacharie M. Leger, Meng Lon Iu, Arsalan Khan, Amr S. Helmy</i>	
A 56Gb/s PAM4 Optical Receiver Integrated with Si-Ge APD.....	147
<i>Ruida Liu, Yiwei Peng, Ankur Kumar, Yuan Yuan, Yang-Hang Fan, Yuanming Zhu, Tong Liu, Hyungryul Kang, Inhyun Kim, Peng Yan, Zhihong Huang, Marco Fiorentino, Raymond Beausoleil, Samuel Palermo</i>	
Real-Time Optical Monitoring of Telecom Data Signals Utilizing Dispersive Fourier Transformation	149
<i>Afsaneh Shoeib, Manuel P. Fernández, Connor Rowe, Reza Maram, Pasquale Ricciardi, José Azaña</i>	
Spurious-Free Spectral Identification Using Clock-Scanned Sampling Heterodyne Spectroscopy	151
<i>Hideto Takayasu, Shuhei Otsuka, Zheqing Sun, Tomoya Suzuki, Takahide Sakamoto</i>	
Adaptive Optimization of Analog-Circuit FIR Filters for High-Bandwidth Arbitrary Optical Spectrum Measurement	153
<i>Zheqing Sun, Shuhei Otsuka, Takahide Sakamoto</i>	
Optimal Node Design in Filterless Horseshoe Networks with Point-To-Multipoint Transceivers	155
<i>J. Pedro, M. M. Hosseini, N. Costa, A. Napoli, J. E. Prilepsy, S. K. Turitsyn</i>	

Estimation Accuracy of Polarization State from Coherent Receivers for Sensing Applications	157
<i>Saverio Pellegrini, Lorenzo Andrenacci, Leonardo Minelli, Dario Pileri, Gabriella Bosco, Luca Della Chiesa, Roberto Gaudino</i>	
Experimental Comparison of Single-Sided and Double-Sided Filtering in ROADM Networks.....	159
<i>S. Searcy, T. Richter, S. Tibuleac</i>	
Longitudinal Power Monitoring Performance with Subcarrier Multiplexing Transmission	161
<i>Lorenzo Andrenacci, Gabriella Bosco, Dario Pileri</i>	
Coexistence of 50 G TWDM with Current PON Infrastructures.....	163
<i>Miquel Masanas, Ana Tavares, Cláudio Rodrigues, João Santos, Josep Prat, Antonio Teixeira</i>	
Ion Implantation Effect on the Performance of Micro-Light Emitting Diodes Array.....	165
<i>Xin-Dai Lin, Yu-Hsuan Hsu, Yi-Hsin Lin, Ray-Hua Horng</i>	
Micro-LED Nanosecond Pulsed Structured Light Sources with 405 Nm – 510 Nm Wavelength.....	167
<i>J. A. Gray, J. J. D McKendry, J. H. Herrnsdorff, M. J. Strain, R. K. Henderson, M. D. Dawson</i>	
Efficient DUV micro-LED and Arrays for Various Applications	169
<i>Huabin Yu, Muhammad Hunain Memon, Shudan Xiao, Haiding Sun</i>	
Tunable Dual Wavelength Laser on Thin Film Lithium Niobate	171
<i>Isaac Luntadila Lufungula, Felix M. Mayor, Jason F. Herrmann, Taewon Park, Hubert S. Stokowski, Alexander Y. Hwang, Camiel Op De Beeck, Okan Atalar, Wentao Jiang, Bart Kuyken, Amir H. Safavi-Naeini</i>	
4H-SiC PIN Photodiode for VUV Detection Using an Enhanced Emitter Doping Design.....	173
<i>M. Schraml, N. Papathanasiou, A. May, M. Rommel, T. Erlbacher</i>	
Evaluation of Requirements for Phase-Shift Cavity Ring-down Spectroscopy Biosensing Using Integrated Microring Resonators	175
<i>Mohammad Hossein Motavas, Timothy Perrier, Andrew G Kirk</i>	
Two-Dimensional Material Based Optoelectronic Devices Rapid Prototyping Using 2D Material Transfer System (2DMTS)	177
<i>C. Patil, E. Heidari, N. Asadizanjani, V. Sorger, H. Dalir</i>	
A Gold-Coated FBG Sensor for Heat-Flux Measurement in Harsh Environment.....	179
<i>R. R. Burgess, S. A. Hulgan, S. J. Mog, A. N. Mazingo, O. G. Thome, A. R. Bruncz, L. Duan</i>	
Electrowetting Lens for Focus-Tunable Three-photon Excitation Microscopy.....	181
<i>S. D. Gilinsky, D. N. Jung, G. L. Futia, M. Zohrabi, T. A. Welton, E. A. Gibson, D. Restrepo, V. M. Bright, J. T. Gopinath</i>	
An Integrated Platform for Mesoscale Quantitative Phase Imaging and Hyperplex Fluorescence Microscopy	183
<i>Maomao Chen, Hongqiang Ma, Jianquan Xu, Xuejiao Sun, Yang Liu</i>	
Artificial Iris on Smart Contact Lens Using Twisted Nematic Cell for Photophobia Alleviation	185
<i>Chayanjit Ghosh, Adwait Deshpande, Mohit U. Karkhanis, Aishwaryadev Banerjee, Erfan Pourshaban, Md. Rabiul Hasan, Amirali Nikeghbal, Md. Golam Dastgir, Hanseup Kim, Carlos H. Mastrangelo</i>	
Plasmonics for Microwave Photonics	187
<i>J. Leuthold, J. Smajic, M. Baumann, H. Ibili, B. Vukovic, L. Kulmer, T. Blatter, Y. Horst, S. M. Koepfli, Y. Fedoryshyn, Y. Salamin, M. Burla</i>	

Near-Ballistic Uni-Travelling-Carrier Photodiodes with Undercut Collector for Enhancements in THz Output Power and Responsivity	190
<i>Yu-Cyuan Huang, Nan-Wei Chen, Ye-Kun Wu, Naseem, Jin-Wei Shi</i>	
Generation of 10.2 dBm Millimeter-Wave Power at 100 GHz Using Soliton Microcomb and Modified Uni-traveling Carrier Photodiode	192
<i>Fatemehsadat Tabatabaei, Jesse S. Morgan, Shuman Sun, Samin Hanifi, Ruxuan Liu, Steven Estrella, Madison Woodson, Steven M. Bowers, Xu Yi, Andreas Beling</i>	
Fabrication of Si/GaAs _{0.5} Sb _{0.49} Heterostructure Diodes Via Transfer Printing.....	194
<i>Yongkang Xia, Sk Shafaat Saud Nikor, Naga Swetha Nallamothe, Rachel L. Adams, Hyemin Jung, Nathan Gajowski, Seunghyun Lee, Ronald M. Reano, Sanjay Krishna, Steven Ringel, Shamsul Arafin</i>	
A-Si:H Layer Enabling a Sub-1.2 dB Loss SiN-III/V-SiN Transition for Evanescently Coupled Lasers at 920 Nm.....	196
<i>K. Akritidis, M. Billet, S. S. Saseendran, S. Poelman, G. Roelkens, P. Neutens, J. Brouckaert, P. Van Dorpe, B. Kuyken</i>	
Single-Photon Downconversion in GaAs, AlGaAs and InGaP-on-insulator.....	198
<i>Emil Zanchetta Ulsig, Magnus Linnet Madsen, Eric John Stanton, Dileep Venkatarama Reddy, Iterio Degli-Eredi, Richard Mirin, Nicolas Volet</i>	
Saturable Absorption in the C-Band Employing 2D 1T'-MoTe ₂	200
<i>Maria Carolina Volpato, Henrique G. Rosa, Pierre-Louis De Assis, Newton Cesário Frateschi</i>	
Coupled Resonators Optical Waveguide Based on Taiji Microresonators.....	202
<i>B. Aslan, R. Franchi, S. Biasi, S. Ali, L. Pavesi</i>	
Nonvolatile Switching in a Ring Resonator with Saturable Absorption.....	204
<i>I. Luntadila Lufungula, B. Kuyken</i>	
Free-Space Gigabit Data Transmission with a Directly Modulated Interband Cascade Laser Epitaxially Grown on Silicon	206
<i>S. Zaminga, P. Didier, H. Kim, D. A. Díaz-Thomas, A. N. Baranov, J. B. Rodriguez, E. Tournié, H. Knötig, O. Spitz, B. Schwarz, L. Cerutti, F. Grillot</i>	
OFDM Signal Transmission Using Distributed Fiber-Optic Acoustic Sensing.....	208
<i>Wataru Kohno, Jian Fang, Shuji Murakami, Giovanni Milione, Ting Wang</i>	
Gigabit Per Second UV-C LEDs for Communications.....	210
<i>H. Zimi, D. M. Maclure, C. Chen, J. J. D. McKendry, D. J. M. Stothard, J. Herrnsdorf, H. Haas, M. D. Dawson</i>	
Underwater Wireless Optical Communications Using Integrated Optical Phased Arrays.....	212
<i>D. M. Desantis, M. Notaros, M. R. Torres, J. Notaros</i>	
Nanoparticle-Doped Polymer Hybrid Material as Color Conversion Layer for Micro-LED Displays Technology	214
<i>Chen-Hsun Wu, Chih-Yuan Tsai, Jian-Hong Lin, Yen-Chia Cheng, Shan-Yu Chen, Chi-Shiang Chen, Ching-Fuh Lin</i>	
Dual-Wavelength Visible Light Communication Through Perovskite-Integrated InGaN Micro-LEDs.....	216
<i>Tae-Yong Park, Yue Wang, Omar Alkhazragi, Jung-Hong Min, Tien Khee Ng, Osman Bakr, Omar Mohammed, Boon S. Ooi</i>	

Temperature and Strain Fiber Sensing Using Orbital Angular Momentum.....	218
<i>K. Wootten, M. Zohrabi, M. E. Siemens, J. T. Gopinath</i>	
Lumped Element Model for an Optomechanical Ultrasound Sensor	220
<i>C. Pieters, R. Haouri, F. R. Lamberti, G. Keulemans, J. Kjellman, X. Rottenberg</i>	
Liquid-Metal-Based SERS Sensors for Trace Analyte Detection.....	222
<i>Shreyan Datta, Xianglong Miao, Peter Q. Liu</i>	
An Optofluidic Nanoplasmonic Sensor for Aerosols	224
<i>Hao Jiang, Sophia Judge</i>	
Phase-Shifted Two-wire Waveguide Bragg Gratings for High Sensitivity Gas Detection in the Terahertz Range.....	226
<i>Y. Cao, K. Nallappan, G. Xu, M. Skorobogatiy</i>	
Large-Scale Label-free Morphological Profiling for Drug Screening by High-throughput Spinning Imaging.....	228
<i>Dickson M. D. Siu, Victor M. L. Wong, Kenneth K. Y. Wong, Kevin K. Tsia</i>	
All-In-one Multimodal Imaging Platform for Information-rich Spatial Biology	230
<i>Hongqiang Ma, Yang Liu</i>	
Noise Filtering of Narrowband Temporal Optical Waveforms by All-Fiber Talbot Processing	232
<i>Majid Goodarzi, Manuel P. Fernandez, José Azaña</i>	
Thermal-Noise-limited, Compact Optical Reference Cavity Operated Without a Vacuum Enclosure.....	234
<i>Yifan Liu, Charles A. McLemore, Megan Kelleher, Dahyeon Lee, Takuma Nakamura, Naijun Jin, Susan Schima, Peter Rakich, Scott A. Diddams, Franklyn Quinlan</i>	
High-Speed Electro-absorption Modulator Integrated DFB Laser Using Traveling-wave Electrodes.....	236
<i>Chen-Yu Yeh, Bo-Hong Chen, Chung-Wei Hsiao, Rih-You Chen, W. Lin, Yi-Jen Chiu</i>	
Machined Aluminum Electrowetting Lens.....	238
<i>R. Oroke, E. J. Micles, S. D. Gilinsky, M. Zohrabi, J. T. Gopinath, V. M. Bright</i>	
Optimization of a Cavity Soliton Dispersive Wave Through Kerr-Induced Synchronization	240
<i>Grégory Moille, Michal Chojnacky, Usman A. Javid, Curtis R. Menyuk, Kartik Srinivasan</i>	
Vernier Microcombs for Future Miniature Yb ⁺ Clocks	242
<i>Nathan P. O'Malley, Kaiyi Wu, Saleha Fatema, Cong Wang, Marcello Girardi, Mohammed S. Alshaykh, Zhichao Ye, Daniel E. Leaird, Minghao Qi, Victor Torres-Company, Andrew M. Weiner</i>	
Non-Volatile III-V/Si Photonic Charge-Trap Flash Memory	244
<i>Stanley Cheung, Yuan Yuan, Yiwei Peng, Yingtao Hu, Geza Kurczveil, Di Liang, Raymond G. Beausoleil</i>	
Robust Generation of Dark Soliton Combs in AlGaAs-On-Insulator Microresonators.....	246
<i>Yang Liu, Chaochao Ye, Yueguang Zhou, Yi Zheng, Yanjing Zhao, Leif Kasto Oxenløwe, Kresten Yvind, Minhao Pu</i>	
A Tutorial on Silicon Heterogeneous Integrated Photonic Integrated Circuits: from Data Centers to Sensors	248
<i>John E. Bowers</i>	

InAs/InP Quantum-Dash Mode-Locked Laser for Duplex Radio Over Fiber Links	250
<i>Jianping Yao, Long Huang, Zhenguo Lu, Ke Wu</i>	
A LEAF-FSO-5G NR/6G Converged System	252
<i>Jia-Lian Jin, Tsai-Man Wu, Yan-Zhen Xu, Chih-Hong Lin, Wei-Xiang Chen, Hai-Han Lu</i>	
Power-Efficient Radio-over-Fiber Aided Spatial Modulation	254
<i>Yichuan Li, Mohammed El-Hajjar</i>	
Enhanced Hybrid Asymmetrically Clipped Optical OFDM for IM/DD OWC Systems	256
<i>Zuhang Geng, Xinke Tang, Yuhan Dong</i>	
High-Efficiency, Superconducting Nanowire Single-photon Detectors from Ultraviolet to Infrared	258
<i>Richard P. Mirin, Benedikt Hampel, Adriana E. Lita, Adam McCaughan, Bakhrom Oripov, Dileep Reddy, Martin J. Stevens, Varun B. Verma, Sae Woo Nam</i>	
P-Doped Bilayer Graphene Based Photodetector with Colloidal Quantum Dots Absorber	260
<i>Md Fazle Rabbe, Volodymyr Sheremet, David Pate, Vitaliy Avrutin, Ümit Özgür, Nibir K. Dhar</i>	
Dynamics of Light-Induced Charge Transfer from Ferroelectric Crystal Surfaces to Metallic Nanoparticles.....	262
<i>Eric Asché, Riccardo Zamboni, Cornelia Denz, Jörg Imbrock</i>	
Analysis of Local Optimization Behavior: Toward a Novel Inverse Design Paradigm	264
<i>Robert P. Pesch, Arjun Khurana, Joel B. Slaby, Jacob Hiesener, Stephen E. Ralph</i>	
Differentiable Modeling of Nonlinear Dynamics in Multimode Fibers	266
<i>H. Kariyawasam, S. Jayasinghe, Y. Jayawardana, D. Wadduwage</i>	
Hardware-Accelerated Inverse Design of a Large-Area CMOS-compatible Grating Coupler.....	268
<i>Xinzhong Chen, Emerson G. Melo, Tyler W. Hughes, Momchil Minkov</i>	
Accelerate Inverse Design of Photonic Devices with GPUs	270
<i>Peng Sun, Andrew Michaels, Liron Gantz</i>	
TDMS: An Open Source Time Domain Maxwell Solver for Simulations in Biomedical Optics.....	272
<i>Peter R. T. Munro</i>	
Polarization-Diversity Optical Coherence Tomography Retinal Imaging of Laser-induced Choroidal Neovascularization in Small Animal Models	274
<i>Jun Song, Yusi Miao, Joanne A. Matsubara, Myeong Jin Ju</i>	
Pre-Transplantation Evaluation of Human Liver Using Polarization-Sensitive Optical Coherence Tomography.....	276
<i>Feng Yan, Chen Wang, Qinghao Zhang, Ebenezer Raj Selvarai Mercyshalinie, Zhongxin Yu, Kar-Ming Fung, Qinggong Tang</i>	
Increasing the Upward Radiation Efficiency of Optical Phased Arrays Using Asymmetric Silicon Horn Antennas.....	278
<i>H. Farheen, S. Joshi, J. C. Scheytt, V. Myroshnychenko, J. Förstner</i>	
Design and Optimization of a Thermal Emitter Using Automatic Machine Learning	280
<i>A. A Odebowale, Salah Abdo, Nusrat Alim, Khalil As'Ham, Haroldo T. Hattori, Andrey. E. Miroshnichenko</i>	

Optimal Design of Omni-Directional Optical Cloaking by Annular Sectorized Unit-cells.....	282
<i>M. Turdueva, M. Ayik, B. K. Yildirim, O. V. Minin, I. V. Minin, H. Kurt</i>	
Polarization Independent Add-Drop Filter	284
<i>L. Sabri, F. Nabki, M. Ménard</i>	
Quantum Interference of Identical Photons from Remote GaAs Quantum Dots.....	286
<i>A. Javadi, G. N. Nguyen, L. Zhai, C. Spinnler, J. Ritzmann, M. C. Löbl, A. D. Wieck, A. Ludwig, R. J. Warburton</i>	
Screening and Deterministic Integration of Nanodiamond-Based Color Centers for High-Bandwidth Quantum Photonics.....	288
<i>S. I. Bogdanov, S. Sahoo, J. Jiang, H. Azzouz, K. Loehr, C. Germany, J. Zhou, B. K. Clark, V. N. Agafonov, V. A. Davydov</i>	
Toward Engineering 2D Atomic Arrays in Solids	290
<i>Trevor Kling, Haechan An, Mahdi Hosseini</i>	
Stable CW Operation of III-V/Si Hybrid Lasers by Chip-on-wafer Direct Bonding Technique Using UV-ozone Hydrophilization.....	292
<i>Naoko Inoue, Takehiko Kikuchi, Naoki Fujiwara, Munetaka Kurokawa, Takuo Hiratani, Toshiyuki Nitta, Akira Furuya, Chang-Yong Lee, Yuhki Itoh, Nobuhiko Nishiyama, Hideki Yagi</i>	
Designs of Resonant-Characteristics-Monitorable Si Wavelength Filters for Heterogeneously Integrated Tunable Lasers.....	294
<i>T. Sato, T. Fujisawa, Y. Sawada, T. Mitarai, T. Hiratani, T. Okimoto, T. Ishikawa, N. Fujiwara, H. Yagi, K. Saitoh</i>	
Optically-Pumped Semiconductor Optical Amplifier with Low Noise Figure.....	296
<i>Dhruvkumar Desai, Aneesh Sobhanan, Inwoong Kim, Olga Vassilieva, Youichi Akasaka, Paparao Palacharla, Xun Li, Sethumadhavan Chandrasekhar, Patrick Likamwa, Guifang Li</i>	
Er-Doped Fiber Design for FM-SDM Amplification	298
<i>P.-O. Janvier, L. A. Rusch, S. Laroche</i>	
Neuromorphic Photonics for Digital Signal Processing	300
<i>L. De Marinis, I. Roumpos, N. Andriolli, M. Moralis-Pegios, N. Pleros, G. Contestabile</i>	
An All-Optical Delayed Complex Perceptron for Signal Equalization in IMDD Fiber Transmission	302
<i>Emiliano Staffoli, Mattia Mancinelli, Paolo Bettotti, Lorenzo Pavesi</i>	
Secure Optical Hashing for Information Compression in a Convolutional Neural Network	304
<i>Haoyan Kang, Maria Solyanik-Gorgone, Jiachi Ye, Behrouz Movahhed Nouri, Hao Wang, Hamed Dalir, Volker J. Sorger</i>	
All-Optical Wavelength Conversion in Optically-Pumped Semiconductor Optical Amplifiers.....	306
<i>Aneesh Sobhanan, Dhruvkumar Desai, Guifang Li</i>	
Spread-Photon Architecture for Quantum-secure Communications.....	308
<i>Michael S. Bullock, Wesley Webb, Samuel H. Knarr, Timothy C. Burt, James A. Drakes, Victor G. Bucklew, Saikat Guha, Boulat A. Bash</i>	
On-Chip Lasers in Silicon Photonics: Pathways to Integration and Applications	310
<i>Xiangpeng Ou, Zhican Zhou, William He, Artem Prokoshin, Ying Shi, Emad Alkhazraji, Yating Wan</i>	

Comparison of InP QDs and GaAsP QW Lasers Grown by MOCVD	312
<i>Wen Gu, Liying Lin, Jie Huang, Wei Luo, Kei May Lau</i>	
In-Plane 1.5 μm DFB Lasers Laterally Grown on SOI	314
<i>Ying Xue, Jie Li, Yi Wang, Ke Xu, Zengshan Xing, Kam Sing Wong, Hon Ki Tsang, Kei May Lau</i>	
Low-Loss III-V Photonics and High Efficiency Grating Couplers Incorporating Low-index AlOx Layers	316
<i>F. T. Albeladi, S. Gillgrass, J. Nabialek, C. Hodges, M. Tang, H. Deng, H -Y. Liu, S. Shutts, P. M. Smowton</i>	
980 Nm QW Lasers with GaAsP Barriers Monolithically Grown on (001) Si by MOCVD	318
<i>Jie Huang, Qi Lin, Wei Luo, Wen Gu, Liying Lin, Kei May Lau</i>	
Optical Tweezing of Microspheres and Cells Using Integrated Optical Phased Arrays	320
<i>T. Sneh, S. Corsetti, M. Notaros, K. Kikkeri, J. Voldman, J. Notaros</i>	
Real Valued Models for Verification of Silicon Photonic Systems.....	322
<i>D. Cross</i>	
Programmable Photonics for Free Space Optics Communications and Computing.....	324
<i>A. Melloni, A. Martinez, G. Cavicchioli, S. Seyedinnavadeh, F. Zanetto, D. A. B. Miller, F. Morichetti</i>	
Near-Petahertz Femtosecond Fieldoscopy: A Leap in Liquid Phase Spectroscopy	326
<i>Anchit Srivastava, Andreas Herbst, Francesco Tani, Hanieh Fattahi</i>	
Measurement of Capillary Wave Phase Velocity Using Orbital Angular Momentum (OAM) and the Doppler Effect	328
<i>E. Robertson, T. Cramer, V. Holsenback, J. Wiley, J. K. Miller, E. G. Johnson</i>	
Ultrafast Dynamic Pulsed Beam Steering Using Virtually Imaged Phased Array.....	330
<i>Suparna Seshadri, Jie Wang, Andrew M. Weiner</i>	
High Throughput Arrayed Waveguide Grating with Resolving Power Over 100,000.....	332
<i>Yang Zhang, Wei-Lun Hsu, Pradip Gatkine, Sylvain Veilleux, Mario Dagenais</i>	
Experimental Determination of the Green's Function with Double Probe THz Near-Field Microscopy	334
<i>J. Gómez Rivas, S. E. T. Ter Huurne, N. J. J. Van Hoof, D. B. L. Peeters, J. L. M. Van Mechelen</i>	
Sub-Terahertz Plasma Wave Generation by Dyakonov-Shur Instability in p-Diamond TeraFET	336
<i>Muhammad Mahmudul Hasan, Nezh Pala, Michael Shur</i>	
Counter-Propagating Scalar and Vector Beams for Subwavelength Shaping and Particle Manipulation	338
<i>Eric Asché, Eileen Otte, Cornelia Denz, Jörg Imbrock</i>	
A Hole Charging Layer of Co ₃ O ₄ Stabilizes the GaN Nanowires and Promotes Efficient Carrier Transport with Record-High Photo-response	340
<i>Yang Kang, Danhao Wang, Xin Liu, D. Haiding Sun</i>	
Nanofabrication of EGaIn Liquid Metal Near-Infrared Photonic Structures.....	342
<i>Md Abdul Kaium Khan, Peter Q. Liu</i>	

Cascaded Quantum Well Structure Emitting Entangled Multiphoton States.....	344
<i>Amir Sivan, Meir Orenstein</i>	
Monolithic InAs QDs Based Active-Passive Integration for Photonic Integrated Circuits	346
<i>A. Enderson, P. Mishra, Z. Cao, F. T. Albeladi, S. Gillgrass, B-P. Ratiu, N. Peng, M. Tang, H-Y. Liu, S. Shutts, P. M. Smowton</i>	
Cavity Quantum Electrodynamics Based on Lifetime-Limited Emission in Hexagonal Boron Nitride.....	348
<i>Sanchaya Pandit, Yanan Wang</i>	
152 Gbaud Transmission Using Strong Ferroelectric Mach-Zehnder Interferometer Modulator	350
<i>Shiyoshi Yokoyama, Jiawei Mao, Futa Uemura, Hiromu Sato, Guo-Wei Lu</i>	
Effects of Junction Doping Profile on the Performance of Traveling-Wave Silicon Modulators.....	352
<i>A. Mohammadi, A. Geravand, L. A. Rusch, W. Shi</i>	
A 160 Gb/s Two-Segment Silicon Microring Modulator with Z-Shape Doping Profile	354
<i>Yuan Yuan, Yiwei Peng, Wayne V. Sorin, Stanley Cheung, Zhihong Huang, Di Liang, Marco Fiorentino, Raymond G. Beausoleil</i>	
50Gb/s Transmission in Short-Reach Distance Using Silicon Photonics Negative-Chirp SiGe EAM.....	356
<i>Ya-Han Chang, Rih-You Chen, Po-Wei Huang, Yi-Jen Chiu</i>	
Variation-Aware Layout and Design Optimization of Silicon Photonic Mach-Zehnder Interferometers	358
<i>Zahra Ghanaatian, Amin Shafiee, Mahdi Nikdast</i>	
Crosstalk Suppression by Mid-Span Isolators in Bidirectional Multi-core Fiber Transmission Systems.....	360
<i>W. Klaus, P. J. Winzer, M. Koshiba</i>	
Digital Few-Mode Fiber Multiplexer Using Multiplane Light Conversion.....	362
<i>Dennis Pohle, Fabio A. Barbosa, Filipe M. Ferreira, Stefan Rothe, Juergen W Czarske</i>	
Statistical Dependence of Average Intercore Crosstalk on Random Loss in Long-Haul Uncoupled MCF Links	364
<i>João L. Rebola, Adolfo V. T. Cartaxo</i>	
On the Degree of Polarization of the Intercore Crosstalk in Weakly-Coupled Multicore Fibers	366
<i>Tiago M. F. Alves, João L. Rebola, Adolfo V. T. Cartaxo</i>	
Slope Efficiency Suppression at High Current Densities in Broad Area AlGaAs Diode Lasers	368
<i>R. J. Deri, W. E. Fenwick, J. Li, D. L. Pope, M. C. Boisselle, D. M. Dutra, L. Martin, M. Crowley, P. Thiagarajan, G. Thaler</i>	
Thermal Lens Engineering for High Brightness Edge Emitters	370
<i>M. J. Miah, D. Martin, A. Ginolas, M. Elattar, P. Della Casa, S. Grützner, S. Strohmaier, A. Knigge, G. Tränkle, P. Crump</i>	
Determination of Laser Diode Nonradiative Carrier Lifetimes Using Subthreshold Power-Current-Voltage Characteristics	372
<i>R. J. Deri, E. McVay, W. E. Fenwick, S. H. Baxamusa, J. Li, N. P. Allen, D. Mittelberger, R. B. Swertfeger, S. J. Telford, M. C. Boisselle, D. L. Pope, D. M. Dutra, L. Martin, L. Gilmore, G. Thaler, M. Crowley, P. Thiagarajan, J. Song</i>	

Enhancing Imaging Performance in Electrowetting Prism Scanners Through Electrode Gap Reduction	374
<i>E. J. Micles, M. Zohrabi, J. T. Gopinath, V. M. Bright</i>	
Transfer-Printing of GeSn Membranes for Broadband Photodetection in the Extended Short-wave Infrared	376
<i>C. Lemieux-Leduc, M. R. M. Atalla, S. Assali, P. Daoust, G. Daligou, J. Brodeur, S. Kéna-Cohen, Y.-A. Peter, O. Moutanabbir</i>	
PZT Micro-Transfer Printing for Photonic MEMS	378
<i>I. Ansari, K. De Geest, J. De Witte, T. Vandekerckhove, H. Rijckaert, E. Picavet, E. Lievens, G. F. Feutmba, T. Van De Veire, B. Kuyken, J. Beeckman, D. Van Thourhout</i>	
Inductively Coupled Plasma Etching of Orthorhombic Gallium Oxide Films Grown by Mist Chemical Vapor Deposition.....	380
<i>Yara Banda, Seong-Ho Cho, Yanqing Jia, Si-Young Bae, Tien Khee Ng, Boon S. Ooi</i>	
Fabrication of Stretchable PDMS Filaments Coupled to Optical Fibers for Elongation Monitoring	382
<i>Diego Ortega-Picazo, Rodolfo A. Carrillo-Betancourt, Juan Hernández-Cordero</i>	
Increasing the Sensitivity of Fabry-Perot Ultrasound Sensors by Multi-channel Averaging.....	384
<i>James A. Guggenheim, Nam Trung Huynh, Edward Z. Zhang, Paul C. Beard</i>	
Design and Development of Plantar Pressure Measurement Device Using Optical Sensor.....	386
<i>Preeta Sharan, Anup M Upadhyaya, Sandip Kumar Roy, Debpriyo Roy</i>	
Automated Photonic Resonator Absorption Microscope for Point of Care Biomarker Detection	388
<i>Weinan Liu, Ayupova Takhmina, Weijing Wang, Shepherd Skye, Xiaojing Wang, Manish Kohli, Utkan Demirci, Brian T. Cunningham</i>	
Photonic Crystal Enhanced Fluorescence with DNA-Based Nano-gripper for Ultrasensitive SARS-CoV-2 Biosensing.....	390
<i>Yanyu Xiong, Lifeng Zhou, Laura Cooper, Skye Shepherd, Tingjie Song, Abhisek Dwivedy, Lijun Rong, Tong Wang, Xing Wang, Brian T. Cunningham</i>	
Microwave and Millimeter-Wave Photonic Imaging Systems	392
<i>Dennis W. Prather, Christopher Schuetz, Shouyuan Shi, Charles Harrity</i>	
Using Free Space Optics for Beamsteering of 5G Metasurface Antenna	394
<i>A. Bilal, A. Quddious, M. A. Antoniadis, A. Kanno, P. T. Dat, K. Inagaki, T. Kawanishi, S. Iezekiel</i>	
System Performance Analysis of a Photonics-Based Wireless Signal Receiver for Terahertz Communication	396
<i>K. Miyake, T. Kaji, A. Kanno, I. Morohashi, A. Otomo, H. Kishikawa, T. Yasui, S. Hisatake</i>	
Ultra-Wideband Microwave Photonic Spectrometer for Planetary Boundary Layer Sensing.....	398
<i>Mehmet Ogut, Shannon Brown, Sidharth Misra, Eric Kittlaus, Pekka Kangaslahti, Janusz Murakowski, Michael Gehl</i>	
Frequency Hopping Communications Link Enabled by Microwave Photonics.....	400
<i>A. Voshell, S. R. O'Connor, T. Clark</i>	
Tomography of Ultrabroadband Polarization-Frequency Hyperentangled Photons	402
<i>Hsuan-Hao Lu, Muneer Alshowkan, Karthik V. Myilswamy, Andrew M. Weiner, Joseph M. Lukens, Nicholas A. Peters</i>	

Procrustean Entanglement Concentration in Dense Wavelength-Division Multiplexing	404
<i>Hsuan-Hao Lu, Muneer Alshowkan, Jude Alnas, Joseph M. Lukens, Nicholas A. Peters</i>	
Tailoring the Brillouin Scattering Spectrum by Thermal Annealing of Acoustically Antiguiding Fiber	406
<i>S. Wang, B. Meehan, T. Hawkins, J. Ballato, P. Dragic</i>	
The Potential for Span Length Increase with NANF	408
<i>Pierluigi Poggiolini, Gabriella Bosco, Yanchao Jiang, Francesco Poletti</i>	
Ultra-Long-Haul WDM PM-16QAM Transmission in a Reduced Inter-Modal Interference NANF.....	410
<i>A Nespola, S R Sandoghchi, L Hooper, M Alonso, T D Bradley, H Sakr, G T Jasion, E Numkam Fokoua, S Straullu, G Bosco, A Carena, Y Jiang, A M Rosa Brusin, Y Chen, J R Hayes, F Forghieri, D J Richardson, F Poletti, P Poggiolini</i>	
Fiber Bragg Grating in Dual Ring Hollow-Core Fiber.....	412
<i>Charu Goel, Yuxi Wang, Seongwoo Yoo, Wonkeun Chang</i>	
Thermal Properties of a Hollow-Core Optical Fiber Spooled onto a Drum with Negative Coefficient of Thermal Expansion.....	414
<i>Irene Barbeito Edreira, Meng Ding, Bo Shi, Zitong Feng, Giuseppe Marra, Ian A. Davidson, Jaroslaw Rzegocki, Seyed Mohammad Abokhamis Mousavi, Gregory T. Jasion, Francesco Poletti, Radan Slavik</i>	
Single-Mode Single-Polarization Hollow-Core Fiber Design at 2 μm	416
<i>Herschel Herring, Md Selim Habib</i>	
Integrated Optical Phased Arrays: AR Displays, 3D Printing, Biophotonics, and Beyond	418
<i>J. Notaros</i>	
SiN-Based Integrated Optical Phased Array for 2D Beam Steering at 905nm.....	420
<i>D. Fowler, S. Guerber, J. Faugier-Tovar, O. Castany, B. Szelag, M. Krakowski</i>	
Machine Learning Aided Nondestructive IC Testing by THz Response	422
<i>Muhammad Mahmudul Hasan, Nezh Pala, Michael Shur</i>	
Avalanche Photodiode with Multiple Multiplication-Layers and Flip-Chip Bonding Package for 4-D FMCW LiDAR Applications	424
<i>Yan-Chieh Chang, Yu-Xiang Lin, Zohauddin Ahmad, Chia-Chien Wei, You-Chia Chang, Jin-Wei Shi</i>	
Entomological Lidar: Where Lasers and Insects Meet	426
<i>Yiyun Li, Robert Brick, Alexei V. Sokolov, Marlan O. Scully</i>	
Power Efficiency of Multi-Channel Silicon Modulators for Coherent Detection	428
<i>Arman Safarnejadian, Leslie A. Rusch, Wei Shi, Ming Zeng</i>	
Bias-Stable Sub-Volt Visible Electro-optic Modulator in Thin-Film Lithium Niobate	430
<i>Oguz Tolga Celik, Nancy Yousry Ammar, Hubert S. Stokowski, Taewon Park, Amir Safavi-Naeini</i>	
Integrated Liquid-Crystal-Based Modulators: Packaging Processes and Evaluation Techniques	432
<i>A. Garcia Coletto, M. Notaros, J. Notaros</i>	
Hybrid III-V/Si High-confinement Lateral-current Injection Optical Waveguide in Si Photonics.....	434
<i>Chih-Min Liao, Wei-Chen Lin, Yang-Jeng Chen, Rih-You Chen, Yi-Jen Chiu</i>	

Liquid Crystal-Based Electrically Controlled Polarization Beam Splitter for Controlling the Logic Gate Operations	436
<i>Vaibhav Sharma, Aloka Sinha</i>	
Refractive Index Modification in Thin Film Barium Titanate-On-Insulator and Dry Etch Free Fabrication of Waveguide Devices	438
<i>Yu Cao, Hong-Lin Lin, Haidong Liang, Andrew Bettioli, Elhadj Dogheche, Aaron Danner</i>	
Inverse Engineering of Absorption and Scattering in Nanoparticles: A Machine Learning Approach.....	440
<i>Alex Vallone, Nooshin M. Estakhri, Nasim Mohammadi Estakhri</i>	
Unitary Control of Optical Absorption and Emission	442
<i>Cheng Guo, Shanhui Fan</i>	
Resonance Properties of Simple and Topological Optical Lattice Slabs	444
<i>Yeong Hwan Ko, Ivan Richer, Robert Magnusson</i>	
Synchronization of Forced Pulses in an Array of Semiconductor Lasers Subject to Optical Feedback.....	446
<i>Olivier Spitz, Suyesh Koyu, Mark Berrill, Yehuda Braiman</i>	
All-Silicon Quantum Light Source by Embedding a Single Color Center in a Nanophotonic Cavity	448
<i>W. Qarony, W. Redjem, Y. Zhiyenbayev, V. Ivanov, C. Papapanos, W. Liu, K. Jhuria, Z. Y. Al Balushi, S. Dhuey, A. Schwartzberg, L. Z. Tan, T. Schenkel, B. Kanté</i>	
Towards Single-Pixel Quantum Thermal Imaging	450
<i>Haechan An, Hamza Ather, Ali Shakouri, Mahdi Hosseini</i>	
Passive Alignment of Fiber Array to InP Photonic Integrated Circuit Using Suspended Waveguides	452
<i>W. Tian, R. Dekker, J. Van Kerkhof, K. Williams, X. Leijtens</i>	
Asymmetric Metasurface Couplers for Silicon Photonic Integrated Circuits.....	454
<i>Sang-Yeon Cho, Weimin Zhou, Justin Bickford</i>	
Bandwidth-Adaptive Single- and Double-Channel Silicon Photonic Contra-Directional Couplers	456
<i>Mohammad Amin Mahdian, Lorenzo Tunesi, Paolo Bardella, Mahdi Nikdast</i>	
Proposal of Dual-Mode Adiabatic 3-dB Coupler Via Shortcuts to Adiabaticity at Wavelength 2.1 μm	458
<i>Taichi Muratsubaki, Takeshi Fujisawa, Takanori Sato, Kunimasa Saitoh</i>	
Remotely Controllable All-Optical MZI-based Thermo-Optic Switch	460
<i>Zhu Liang, Yuya Shoji</i>	
Development and Demonstration of Cutting-Edge Technologies for Time-domain Diffuse Optics	462
<i>L. Di Sieno</i>	
Improvement of Thermal Dissipation of High-Power Photodiodes	464
<i>Junwu Bai, Yang Shen, Peng Yao, Dekang Chen, Matthew Konkol, Xiangwen Guo, Bingtian Guo, Victoria Carey, Joe C. Campbell, Dennis Prather</i>	
Saturation Effects in Heterogeneously Integrated High-Speed Photodiodes on Thin-film Lithium Niobate	466
<i>Xiangwen Guo, Lingyan He, Mian Zhang, Andreas Beling</i>	
Analysis of Silicon Nitride Trampoline Resonators for Ultrasensitive Infrared Detection	468
<i>Yuncong Liu, Connor A. Watkins, Philip X.-L. Feng</i>	

Self-Powered Flexible Broadband Photodetector Enabling Detection Across Visible to Near Infrared Wavelengths.....	470
<i>Hao Wang, Jiachi Ye, Haoyan Kang, Chaobo Dong, Chandraman Patil, Volker J. Sorger, Hamed Dalir</i>	
Photonic VCSEL-Based Time-Delay Reservoir Computer for Classification of RADAR Signals.....	472
<i>J. Robertson, M. Hejda, D. Owen-Newns, C. Clemente, A. Hurtado</i>	
Multiplexed OAM Beams Classification Via Fourier Optical Convolutional Neural Network	474
<i>Jiachi Ye, Haoyan Kang, Hao Wang, Salem Altaieb, Elham Heidari, Navid Asadizanjani, Volker J. Sorger, Hamed Dalir</i>	
Impact of Free-Carrier Nonlinearities on Silicon Microring-based Reservoir Computing	476
<i>Bernard. J. Giron Castro, Christophe Peucheret, Darko Zibar, Francesco Da Ros</i>	
Application-Specific Photonic Integrated Chip for Partial Differential Equations.....	478
<i>C. Shen, B. Jahannia, B. Movahhed Nouri, H. Dalir, N. Peserico, V. J. Sorger</i>	
Ultra Broadband Anti-Reflection by Multi-layer Resonant Metasurfaces.....	480
<i>D. Arad, J. Scheuer</i>	
Reflective Color Filter Using Series Connection of Semiconductors in Asymmetric Fabry-Perot Nanocavity.....	482
<i>Kirtan P. Dixit, Zachary B. Houtman, Don A. Gregory</i>	
Impact of Glass Composition on Visible Nonlinear Emission in Nanostructured Barium Aluminum Fluorosilicate Fibers	484
<i>A. R. Pietros, T. Hawkins, M. Cavillon, J. Ballato, P. D. Dragic</i>	
Continuous Blood Lactate and Potassium Monitoring Via Intravascular Catheter Fiber Optic Sensors	486
<i>Lawrence A. Renna, Narciso Guzman, Emily Vuu, George Harea, Gerardo Ico, Teryn Roberts, Andriy Batchinsky</i>	
Myocardial Tissue Characterization Using Mueller Matrix-Based Optical System.....	488
<i>A. Twinkle, B. Seema Patel, C. Poojasree M, D. Prasanna Simha Mohan Rao, E. Hardik J. Pandya</i>	
Highly Sensitive PCF-SPR Biosensor for Glioblastoma Brain Cancer Detection.....	490
<i>Atiqul Alam Chowdhury, Md Rezaul Hoque Khan, Obydullah, Mohammed Imamul Hassan Bhuiyan, Mohammad Rakibul Islam, Mirza Muntasir Nishat</i>	
Reconfigurable Microwave Photonic Filter with Linear Amplitude Response Based on Quantum Dash Mode-Locked Laser for Instantaneous Frequency Measurement.....	492
<i>Yuxuan Xie, Mostafa Khalil, Jiaren Liu, Zhenguo Lu, Philip J. Poole, John Weber, Lawrence R. Chen</i>	
A 16-32GHz RF Silicon Photonic Receiver with 22nm FD-SOI CMOS Driver.....	494
<i>Yu-Lun Luo, Dharma Paladugu, Ramy Rady, Kamran Entesari, Samuel Palermo</i>	
Broadband Electro-Optic Comb Generation Using a Stable and Low Noise Photonically Filtered Optoelectronic Oscillator.....	496
<i>Lawrence Robert Trask, Srinivas Varma Pericherla, Chinmay Shirpurkar, Peter J. Delfyett</i>	
Self-Referenced Full-field Acquisition of Optical Signals Via a Real-time Photonics Spectrogram	498
<i>B. Crockett, C. M. L. Rowe, J. Azaña</i>	

Enhancing THz Chemical Sensing with Elliptical Cladding Elements in Negative Curvature Fibers	500
<i>Ethan Howard, Julia Ward, Bradley King, Ahmet E. Akosman</i>	
Bipolar Photoresponse in P–n Heterojunction for Spectrally Distinctive Photodetection.....	502
<i>Wei Chen, Danhao Wang, Dongyang Luo, Yang Kang, Shi Fang, Haiding Sun</i>	
Titanium Dioxide Modified Optical Fiber Refractometer	504
<i>Moutusi De, Nirmal Punjabi, Soumyo Mukherji</i>	
Wearable UV Photodetectors with Sol-Gel-based Metal-oxide Films Operating at sub-V	506
<i>Sang-Joon Park, Tae-Jun Ha</i>	
Ultra-Low Tuning Power Electro-optically Tunable Laser for Coherent WDM Systems	508
<i>Y. Ueda</i>	
Second-Order Optical Nonlinearities in Ferroelectric ScAlN for Quantum Photonics	510
<i>Jiangnan Liu, Pierre-Luc Thériault, Shuai Liu, Ding Wang, Wade Wu, Qiannan Wen, Zheshen Zhang, Moe Soltani, Mackillo Kira, Stéphane Kéna-Cohen, Zetian Mi</i>	
Mid-Infrared All-ZBLAN Optical Fiber Couplers	512
<i>G. T. Zeweldi, Y. F. Li, M. Laparé, J. C. Li, J. Xu, M. Rezaei, H. M. Shamim, M. Rochette</i>	
ITO-Based Spatial Light Modulators for Potential Integration with VCSELs and Photonic Integrated Circuits	514
<i>Hao Wang, Martin Thomaschewski, Jiachi Ye, Haoyan Kang, Yaliang Gui, Chaobo Dong, Chandraman Patil, Elham Heidari, Volker J. Sorger, Hamed Dalir</i>	
VO ₂ -Based All-optical Reflection Modulator for 2 μ m Wave Band	516
<i>Md Asif Hossain Bhuiyan, Shamima Akter Mitu, Sajid Muhaimin Choudhury</i>	
Improved Current Injection for Resonant Leaky-Wave Coupled Arrays of Mid-Infrared Quantum Cascade Lasers	518
<i>Shuqi Zhang, Jae Ha Ryu, Jeremy D. Kirch, Dan Botez, Luke J. Mawst, Tom Earles, Steven Ruder</i>	
Active-Region Design of Mid-Infrared Quantum Cascade Lasers Via Machine Learning	520
<i>Y. Hu, S. Suri, J. D. Kirch, B. Knipfer, S. Jacobs, S. K. Nair, Z. Zhou, Z. Yu, D. Botez, L. J. Mawst</i>	
Development of Novel far-UVC Light Source for High Germicidal Effects and Low Human Health Risk.....	522
<i>K. Shinoda, K. Mawatari, T. K. N. Bui, H. Hirakawa, K. Awamoto, M. Wakitani, T. Shinoda, A. Takahashi</i>	
All-Fiber Erbium-doped ZBLAN Ring Cavity Laser.....	524
<i>N. Karampour, G. T. Zewedi, M. Rochette</i>	
Micro Ring-Structured Deep Ultraviolet LEDs with Enhanced Light Extraction Efficiency	526
<i>Muhammad Hunain Memon, Huabin Yu, Hongfeng Jia, Shudan Xiao, Haiding Sun</i>	
Multi-Mode Interference Reflector for Integrated Photonics	528
<i>F. T. Albeladi, S. Gillgrass, J. Nabialek, P. Mishra, R. Forrest, T. R. Albiladi, C. P. Allford, S. Shutts, P. M. Smowton</i>	
Selection of Illumination Angles for Object Rotation and Illumination Scanning Configurations in Optical Diffraction Tomography	530
<i>John A. B. Aziz, Seth Smith-Dryden, Bahaa E. A. Saleh, Guifang Li</i>	

Deeply Subwavelength Terahertz Solid Immersion Microscopy Using Rutile Optics	532
<i>V. A. Zhelnov, N. V. Chernomyrdin, G. M. Katyba, A. A. Gavdush, V. V. Bukin, S. V. Garnov, I. E. Spektor, V. N. Kurlov, M. Skorobogatiy, K. I. Zaytsev</i>	
Characterizing Optical Randomness of the Surface and Bulk in Multiply Scattering Media.....	534
<i>S. Dawda, A. Dogariu</i>	
Ultrafast Visible Light Imaging: 100 Gigavoxels/sec Time-Stretch 4D-Optical Coherence Tomography.....	536
<i>H. Asghari</i>	
40-Nm Widely Tunable Laser with Mach-Zehnder Interferometer Based Intra-cavity Filter	538
<i>T. Kabir, S. Tondini, J. Hazan, M. J. R. Heck</i>	
Active and Passive Mode-Locking of a Laser Using a Graphene Modulator on an SOI Chip.....	540
<i>T. Reep, C. Wu, S. Brems, D. Yudistira, J. Van Campenhout, M. Pantouvaki, D. Van Thourhout, B. Kuyken</i>	
Low Phase Noise InP-SiN Hybrid Mode-Locked Laser Working at 3.64 GHz.....	542
<i>F. Duport, S. Boust, Y. Ibrahimi, G. Baili, G. Dande, Q. Wilmart, S. Garcia, C. Fortin, A. Garreau, J-F. Paret, K. Mekhazni, H. Gariah, P. Charbonnier, F. Blache, F. Van Dijk</i>	
Broadband Quantum-Dot Frequency-Modulated Comb Laser Induced by Kerr Nonlinearity.....	544
<i>Bozhang Dong, Mario Dumont, Osama Terra, Heming Wang, Andrew Netherton, John E. Bowers</i>	
Fabricating and Testing AlGaInAs Multiple Quantum-Well Laser Diodes for Space Application.....	546
<i>Di Huang, Bryant Colin, Kellen P. Arnold, Enxia Zhang, Sharon M. Weiss, Robert A. Reed, Peter J. Delfyett</i>	
External Cavity Optical Filtering and Self-Injection Locking a Chip-scale Mode-locked Laser Using a Fabry-Perot Etalon.....	548
<i>Srinivas Varma Pericherla, Lawrence Trask, Chinmay Shirpurkar, Ashish Bhardwaj, Gloria E. Hoefler, Peter J. Delfyett</i>	
Towards System-On-chip Integration of Photonic-based Coherent Distributed Synthetic Aperture Radar	550
<i>L. Rinaldi, F. Camponeschi, H. Amir, S. Maresca, M. Reza, G. Pandey, M. Imran, M. Scaffardi, A. Bogoni</i>	
Integrated Microwave-To-Optical Converters on Thin- Film Lithium Niobate	552
<i>Farzaneh A. Juneghani, Milad G. Vazimali, Ectis Velazquez, Kim F. Lee, Xun Gong, Gregory S. Kanter, Sasan Fathpour</i>	
Compact and High-Extinction-ratio Integrated Optical Switch for Optical True Time Delay	554
<i>Jianfu Wang, Shijie Song, Liwei Li, Linh Nguyen, Xiaoke Yi</i>	
A Multi-Layer Topologically Reconfigurable Broadcast-and-Weight Photonic Neural Network.....	556
<i>Joshua C. Lederman, Yusuf Jimoh, Simon Bilodeau, Weipeng Zhang, Eric C. Blow, Thomas Ferreira De Lima, Bhavin J. Shastri, Paul R. Prucnal</i>	
Sparse Coherent Photonic Processor for Solving Eigenmode Problems	558
<i>Zheyuan Zhu, Andrew B. Klein, Dewan Saiham, Guifang Li, Shuo Pang</i>	
Optical Freespace Michelson Interferometric Reconfigurable Full Complex Convolution Module.....	560
<i>Haoyan Kang, Jiachi Ye, Hao Wang, Hamed Dalir, Volker J. Sorger</i>	

Thermal Crosstalk Modeling and Compensation for Programmable Photonic Processors	562
<i>Ali Cem, David Sanchez-Jacome, Daniel Pérez-López, Francesco Da Ros</i>	
Single-Shot Waveform Measurement of Shortwave Infrared Pulses for Nonlinear Propagation Detection	564
<i>T.-C. Truong, Y. Liu, D. Khatri, B. Shim, M. Chini</i>	
Efficient Supercontinuum Generation in a Filter-Less Cascade of Silica, Fluoride, and Chalcogenide Fibers	566
<i>Md Hosne Mobarok Shamim, Martin Rochette</i>	
Integrated Photonic with Divacancy Defects in 4H-SiC-on-Insulator Platform.....	568
<i>B. Huang, B. Yurash, S. Whiteley, X. Bai, L. Yang, T. Wang, S. Wang, T. Ladd, S. Cui</i>	
Enhancing the Luminescence Efficiency of Colloidal Quantum Dots in Compound Supraparticles	570
<i>Pedro Urbano Alves, Dimitars Jevtics, Michael J. Strain, Martin D. Dawson, Nicolas Laurand</i>	
Photocatalytic-Ready Supraparticle Lasers	572
<i>C. J. Eling, N. Laurand</i>	
Rate-Adaptive Geometric Shaping for BICM with Off-the-shelf Component Blocks	574
<i>Metodi P. Yankov, Smaranika Swain, Francesco Da Ros</i>	
Record Photon Information Efficiency with Optical Clock Transmission and Recovery of 12.5 Bits/photon After 77 dB of Optical Path Loss	576
<i>C. Guo, S. K. Dacha, R. J. Essiambre, A. Ashikhmin, A. Blanco-Redondo, F. R. Kschischang, K. Banaszek, Matthew Weiner, R. Kopf, I. Crawley, M. H. Idjadi, A. A. Sayem, J. Zhao, J. D. Sandoz, N. Fontaine, N. Menkart, R. Ryf, J. Cloonan, M. Vasilyev, T. E. Murphy, E. C. Burrows</i>	
Surface Acoustic Wave Brillouin Scattering in a Photonic Integrated Circuit.....	578
<i>Govert Neijts, Choon Kong Lai, Maren Kramer Riseng, Duk-Yong Choi, Kunlun Yan, David Marpaung, Stephen J. Madden, Benjamin J. Eggleton, Moritz Merklein</i>	
High-Speed Physical Random Number Generation Using Self-Chaotic Broad-Area VCSEL.....	580
<i>Hang Lu, Omar Alkhazragi, Tien Knee Ng, Boon S. Ooi</i>	
Foundry-Fabricated Silicon Source of Broadband Polarization Entanglement	582
<i>Alexander Miloshevsky, Lucas M. Cohen, Karthik V. Myilswamy, Saleha Fatema, Muneer Alshowkan, Hsuan-Hao Lu, Andrew M. Weiner, Joseph M. Lukens</i>	
Ultra Low Density and High Performance InAs Quantum Dot Single Photon Emitters	584
<i>C. Shang, M. De Gregorio, Q. Buchinger, S. Hoefling, J. E. Bowers</i>	

Author Index