

International Symposium on Physics and Applications of Laser
Dynamics 2024 (IS-PALD 2024)

CONFERENCE PROGRAM

Omiya Sonic City, Saitama City, Japan

November 5, 2024 (Tuesday)	
10:00 – 10:20	Opening A. Uchida 1) Saitama University, Japan.
Session 5-1 (Chair: A. Uchida)	
10:20 – 11:10	R. Roy (Keynote) <i>Optoelectronic oscillators in the single photon regime: dead time effects and polarization alignment with entangled photons</i> 1) University of Maryland, USA.
11:10 – 11:40	Coffee break
Session 5-2 (Chair: S.-K. Hwang)	
11:40 – 12:10	A. Skalli, A. Grabulosa, D. Brunner (Invited) <i>Physics, integration and training of scalable and autonomous photonic neural networks</i> 1) Institut FEMTO-ST, France.
12:10 – 12:40	S. Sunada, K. Kitagawa, T. Yamaguchi (Invited) <i>Photonic neuro-inspired sensor processing</i> 1) Institute of Science and Engineering, Kanazawa University, Japan.
12:40 – 14:00	Lunch
Session 5-3 (Chair: A. Locquet)	
14:00 – 14:30	M. Goldmann, M. C. Soriano (Invited) <i>Optimisation of laser dynamics for information processing</i> 1) Institute for Cross-Disciplinary Physics and Complex Systems, IFISC (CSIC-UIB), Spain.
14:30 – 15:00	M. Nakajima (Invited) <i>WDM-based programmable photonic processor for machine learning and optical communications</i> 1) NTT Device Technology Labs., Japan

15:00 – 15:20	P.-W. Hou, C.-T. Lee, F.-Y. Lin <i>A hybrid TDM/WDM real-time Multi-Input-Multi-Output (MIMO) pulsed chaos lidar system</i> 1) Institute of Photonics Technologies, Department of Electrical Engineering, National Tsing Hua University, Taiwan.
15:20 – 15:40	H.-W. W. Lin¹, C.A. Sung¹, Y.-H. Hung^{1,2} <i>Phase-locked P1 nonlinear laser dynamics for microwave photonic switch in RF-OFDM down-link</i> 1) Department of Photonic, National Sun Yat-sen University, Taiwan. 2) Miniaturized Photonic Gyroscope Research Center, National Sun Yat-sen University, Taiwan.
15:40 – 16:00	J. Mercadier, S. Bittner, D. Rontani, M. Sciamanna <i>Analysis of chaotic dynamics generated by free running BA-VCSELs</i> 1) Chaire Photonique, LMOPS, CentraleSupélec, France. 2) Université de Lorraine, CentraleSupélec, LMOPS, France.
16:00 – 16:30	Coffee break
Session 5-4 (Chair: D. Rontani)	
16:30 – 17:00	L. Zhang, J. Ruan, S.-C. Chan (Invited) <i>Residual side mode dynamics in semiconductor lasers</i> 1) Department of Electrical Engineering, City University of Hong Kong, China.
17:00 – 17:30	S. Abdollahi, M. Ladouce, P. M. Palomo, M. Virte (Invited) <i>Dynamics of multi-wavelength lasers for all-optical processing applications</i> 1) Brussels Photonics Team (B-PHOT), Dept. of Applied Physics and Photonics, Vrije Universiteit Brussel, Belgium.
17:30 – 17:50	C.-H. Tseng¹, R. Funabashi², K. Kanno², A. Uchida², C.-C. Wei³, S.-K. Hwang^{1,4} <i>High-entropy chaotic microwave generation using a semiconductor laser with modulated optical injection</i> 1) Department of Photonics, National Cheng Kung University, Taiwan. 2) Department of Information and Computer Sciences, Saitama University, Japan. 3) Department of Photonics, National Sun Yat-Sen University, Taiwan. 4) Meta-nanoPhotonics Center, National Cheng Kung University, Taiwan.
17:50 – 18:10	L. Oliverio, D. Rontani, M. Sciamanna <i>Nonlinear dynamics and timescales interplay in a laser diode under simultaneous optical injection and optical feedback</i> 1) Chaire Photonique, LMOPS, CentraleSupélec, France.
18:10 – 18:30	R. de Mey¹, S. W. Jolly², A. Locquet^{3,4}, M. Virte¹ <i>WDM-Based programmable photonic processor for machine learning and optical communications</i> 1) Brussels Photonics Team (B-PHOT), Vrije Universiteit Brussel, Belgium. 2) Service OPERA-Photonique, Université Libre de Bruxelles, Belgium. 3) Georgia Tech – CNRS IRL 2958, Georgia Tech Europe, France. 4) School of Electrical and Computer Engineering, Georgia Institute of Technology, USA.

November 6, 2024 (Wednesday)	
Session 6-1 (Chair: S. Sunada)	
9:30 – 10:20	G. Tanaka (Keynote) <i>Recent progress in reservoir computing: methods and applications</i> 1) Nagoya Institute of Technology, Japan.
10:20 – 10:50	Coffee break
Session 6-2 (Chair: M. C. Soriano)	
10:50 – 11:20	L. Larger (Invited) <i>Delay dynamics as a virtual network: theory with chimera states, applications with reservoir computing</i> 1) FEMTO-ST institute, France.
11:20 – 11:50	H. Dong, L. Jaurigue, K. Lüdge (Invited) <i>Photonic reservoir computing with quantum dot lasers</i> 1) Institut für Physik, Technische Universität Ilmenau, Germany.
11:50 – 12:10	Y.-W. Shen¹, R.-Q. Li¹, G. Xu², J. Yu¹, X. He¹, L. Yi², C. Wang¹ <i>Deep photonic reservoir computer for the fiber nonlinearity compensation of 16-QAM signals</i> 1) ShanghaiTech University, China 2) Shanghai Jiao Tong University, China.
12:10 – 12:30	M. You¹, S. Sunada² <i>Photonic reservoir computing based on a ray-chaotic microcavity</i> 1) Waseda University, Japan. 2) Kanazawa University, Japan.
12:30 – 14:00	Lunch
Session 6-3 (Chair: T. Mihana)	
14:00 – 15:20	Poster session (See poster session program)
Session 6-4 (Chair: M. Virte)	
15:30 – 16:00	T. Harayama (Invited) <i>Wave chaos meets laser dynamics in chaotic billiard lasers</i> 1) Department of Applied Physics, School of Advanced Science and Engineering, Waseda University, Japan
16:00 – 16:20	T. Yamagami¹, M. Hasegawa², T. Mihana¹, R. Horisaki¹ <i>Stochastic process model for decision-making acceleration by negatively autocorrelated time sequences</i> 1) The University of Tokyo, Japan. 2) Tokyo University of Science, Japan.

16:20 – 16:40	S. Kotoku, T. Mihana, A. Röhm, R. Horisaki <i>Chaotic leader-laggard cluster synchronization in delay-coupled semiconductor lasers for multi-agent reinforcement learning</i> 1) Department of Information Physics and Computing, Graduate School of Information Science and Technology, The University of Tokyo, Japan.
16:40 – 17:10	Coffee break
Session 6-5 (Chair: A. Röhm)	
17:10 – 17:40	P. Li, Y. Wang (Invited) <i>Parallel random bit generation based on optical chaos</i> 1) Institute of Advanced Photonics Technology, School of Information Engineering, Guangdong University of Technology, China. 2) Key Laboratory of Photonic Technology for Integrated Sensing and Communication, Ministry of Education of China, Guangdong University of Technology, China. 3) Guangdong Provincial Key Laboratory of Information Photonics Technology, Guangdong University of Technology, China.
17:40 – 18:00	T. Niiyama, S. Sunada <i>Self-organized criticality induced by long delayed feedback in semiconductor lasers</i> 1) Kanazawa University, Japan.
18:00 – 18:20	Y. Tsurumi, S. Kudo, K. Kanno, A. Uchida <i>Physical random number generation using complex electric-field amplitude with bandwidth enhancement</i> 1) Saitama University, Japan.

November 7, 2024 (Thursday)	
Session 7-1 (Chair: F. Köster)	
9:30 – 10:00	C.-H. Tseng¹, C.-T. Lin², and S.-K. Hwang^{1,3} (Invited) <i>Two mutually coupled semiconductor lasers for broadband tunable terahertz-wave generation with high spectral purity</i> 1) Department of Photonics, National Cheng Kung University, Taiwan. 2) Department of Photonics, National Sun Yat-Sen University, Taiwan. 3) Meta-nanoPhotonics Center, National Cheng Kung University, Taiwan.
10:00 – 10:30	A. Wang (Invited) <i>Hybrid integrated chaos photonic circuits</i> 1) Institute of Advanced Photonics Technology, School of Information Engineering, Guangdong University of Technology, China. 2) Key Laboratory of Photonic Technology for Integrated Sensing and Communication, Ministry of Education of China, Guangdong University of Technology, China. 3) Guangdong Provincial Key Laboratory of Information Photonics Technology, Guangdong University of Technology, China.
10:30 – 11:00	Coffee break
Session 7-2 (Chair: K. Kanno)	
11:00 – 11:30	H. Huang¹, H. Kim¹, T. Poletti¹, D. A. D.-Thomas², M. Fagot², A. N. Baranov², L. Cerutti², F. Grillot^{1,3} <i>Optical pulse package generation using interband cascade lasers subjected to optical feedback</i> 1) LTCI, Telecom Paris, Institut Polytechnique de Paris, France. 2) Institut d'Electronique et des Systèmes, Université de Montpellier, France. 3) Center of High Technology Materials, University of New-Mexico, USA.
11:30 – 12:00	M. S. Islam, G. Danilenko, A. Kovalev, D. S. Citrin, E. Viktorov, A. Locquet (Invited) <i>Nonlinear dynamics of laser diodes with optoelectronic feedback revisited</i> 1) Georgia Tech-CNRS IRL 2958, France 2) School of Electrical and Computer Engineering, Georgia Institute of Technology, USA. 3) ITMO University, Russia.
12:00 – 12:20	Best Student Paper Award Ceremony
12:20 – 13:30	Lunch
13:30 – 18:00	Discussion and meeting

Poster Session

November 6, 2024 (Wednesday)

14:00 – 15:20

P-1	F. Kuwashima¹, M. Jarrahi², S. Cakmakyapan², K. Wada³, M. Haraguchi⁴, Y. Kawakami⁵, T. Moriyasu⁶, O. Morikawa⁷, K. Kurihara⁸, H. Kitahara⁹, T. Furuya⁹, M. Nakajima¹⁰, M. Tani⁹ <i>Highly efficient and Wide range THz wave using chaotic supremacy</i> 1) Department of Electrical, Electronic and Computer Engineering, Faculty of Engineering, Fukui University of Technology, Japan. 2) Electrical and Computer Engineering Department, University of California Los Angeles, USA. 3) Department of Physics and Electronics, Osaka Metropolitan University, Japan. 4) Graduate School of Technology, Industrial and Social Science, Tokushima University, Japan. 5) Department of Electronics and Information Engineering, National Institute of Technology (KOSEN), Japan. 6) Faculty of Engineering, University of Fukui 3-9-1 Bunkyo, University of Fukui, Japan. 7) Chair of Liberal Arts, Japan Coast Guard Academy, Japan. 8) School of Education., University. of Fukui, Japan. 9) Research Center for Development of Far-Infrared Region, University of Fukui, Japan. 10) Institute of Laser engineering, Osaka Univ., Japan.
P-2	F. Köster, K. Kanno, A. Uchida <i>Attention-enhanced reservoir computing predicting multiple attractors</i> 1) Saitama University, Japan.
P-3	M. Arai¹, T. Yamagami², T. Mihana², R. Horisaki², M. Hasegawa¹ <i>A study on optimal beam selection using a multi-armed bandit algorithm based on a five-state quantum walk</i> 1) Department of Electrical Engineering, Faculty of Engineering, Tokyo University of Science, Japan 2) Department of Information Physics and Computing, Graduate School of Information Science and Technology, The University of Tokyo, Japan.
P-4	H. Shiratori¹, A. Röhm¹, T. Yamagami¹, E. Segawa², T. Mihana¹, R. Horisaki¹ <i>Conflict avoidance in two-walker quantum walk through entanglement</i> 1) Department of Information Physics and Computing, Graduate School of Information Science and Technology, The University of Tokyo, Japan. 2) Graduate School of Environment and Information Sciences, Yokohama National University, Japan.
P-5	K. Takabayashi¹, T. Maruyama², T. Niiyama³, S. Sunada³ <i>Real-time image anomaly detection using all-photon reservoir chip with integrated readout layers</i> 1) Graduate School of Natural Science and Technology, Kanazawa University, Japan. 2) Faculty of Electrical, Information and Communication Engineering, Institute of Science and Engineering, Kanazawa University, Japan. 3) Faculty of Mechanical Engineering, Institute of Science and Engineering, Kanazawa University, Japan.

P-6	T. Ito¹, K. Kanno¹, S. Kawakami², A. Uchida¹ <i>Performance evaluation of approximate reservoir computing with a semiconductor laser</i> 1) Saitama University, Japan. 2) Kyushu University, Japan.
P-7	K. Kase, A. Kawakami, A. Uchida <i>Replication of chaotic laser dynamics with noise by reservoir computing</i> 1) Saitama University, Japan.
P-8	N. Honjo, K. Kanno <i>Improvement of memory capacity in photonic reservoir computing based on digital micromirror devices</i> 1) Department of Information and Computer Sciences, Saitama University, Japan.
P-9	S. Park, K. Takehana, A. Uchida <i>Decision making for multi-armed bandit problem using dynamics in photonic complex networks</i> 1) Saitama University, Japan.
P-10	Y. Nagatsuka¹, T. Niiyama², S. Sunada², A. Uchida¹, K. Kanno¹ <i>Impact of alternative functions for augmented DFA in delay-based physical deep learning</i> 1) Department of Information and Computer Sciences, Saitama University, Japan. 2) Faculty of Engineering, Institute of Sciences and Engineering, Kanazawa University, Japan.
P-11	Y. Fujii, A. Uchida <i>Secure computation with optical pass-gate logic using three optical switches</i> 1) Saitama University, Japan.
P-12	K. Ishimine, A. Uchida <i>Common-signal-induced synchronization using a semiconductor laser driven by broadband noise light</i> 1) Department of Information and Computer Sciences, Saitama University, Japan.
P-13	F. Kumagai, T. Kimura <i>A probability routing strategy using gravitational centrality for various topologies of communication networks</i> 1) Graduate School of Electronics, Information and Media Engineering, Nippon Institute of Technology, Japan. 2) Department of Electrical Electronics and Communication Engineering, Nippon Institute of Technology, Japan.
P-14	G.-T. Lu, C.-H. Tseng, S.-K. Hwang <i>Optically injected semiconductor lasers at period-one dynamics for microwave generation over multiple bands</i> 1) Department of Photonics, National Cheng Kung University, Taiwan. 2) Meta-nanoPhotonics Center, National Cheng Kung University, Taiwan.
P-15	R. Ito, R. Iwami, A. Uchida <i>Dynamics of a semiconductor laser with gain switching by sinusoidal modulation</i> 1) Saitama University, Japan.
P-16	D. Saito, Y. Tsurumi, R. Iwami, A. Uchida <i>Random number generation in a chaotic multimode semiconductor laser with bandwidth enhancement</i> 1) Saitama University, Japan.