

Best Student Paper Award Nomination

ACP2026-0701-146

High-Fidelity Integer Factorization by QUBO Optimization on a Photonic Ising Chip

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We demonstrate a hardware-assisted 32-bit integer factorization workflow that optimizes a QUBO-derived factorization energy model with a packaged photonic Ising chip.

The Ising machine enabled by a multichannel cascaded Mach-Zehnder modulators provides the 7-bit calibrated optical readouts used to evaluate energy differences in order for performing spin flipping, Metropolis updating, and candidate factors verification.

On a retained optimized five-instance set of 32-bit QUBO-derived block factorization models, the best optical-path annealing runs increase the aggregate factorization success count from 5/250 for direct bit flips and 22/250 for circuit annealing simulation to 91/250.

These results demonstrate that a calibrated photonic chip can serve as a practical and scalable accelerator for hardware-assisted QUBO factorization, paving the way toward photonic-enabled large-scale integer factorization.

ACP2026-0715-178

A 1.2 dB Insertion Loss on-Chip Mach-Zehnder Interferometer Type Optical Isolator Based on Stoichiometric Ce:YIG Magneto-Optical Thin Films

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We demonstrate a heterogeneously integrated Mach-Zehnder interferometer optical isolator on a silicon nitride platform. By eliminating intragranular defects in Ce:YIG films, the device achieves a record-low insertion-loss of 1.2 dB and 27.6 dB isolation ratio.

ACP2026-0626-10

Inverse-Designed Meta Processing Units for Task-aware Photonic Computing Systems

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Photonic matrix processors require compact, composable operators for task-aware computing. Here, we demonstrate inverse-designed meta processing units (MPUs) with coherent matrix cascading, hardware-in-the-loop dual-task learning, and neuron-level sharing, reducing programmable-mesh burden while preserving task-specific adaptation.

ACP2026-0701-205

Robust and Low-Complexity Duobinary-Encoded Out-of-Band Channel with Adaptive Equalization for Shared 200G Coherent Transceiver

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We demonstrate a Duobinary-encoded out-of-band channel sharing a 200-Gbps coherent PON transceiver over 20-km SSMF, recovered by low-complexity absolute-value operation tolerant to frequency offset, phase noise, and polarization rotation, reaching 1E-6 threshold at -40.5 dBm.

ACP2026-0715-47

Pulse-Synchronous Time-Domain Segmented Entropy Loading for Co-Wavelength Integrated sensing and communication Systems

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We propose a pulse-synchronous time-domain segmented entropy loading scheme for co-wavelength optical ISAC, achieving a 0.2-bit/symbol GMI improvement and 3-dB required OSNR reduction while preserving 1-kHz DAS over 10.91-km SSMF.

ACP2026-0713-4

Low Memory Target-Response MLSE Receiver for Absorption-Notch-Resilient Hollow-Core Fiber Coherent Links

Tianhong Zhang¹;Yutong Pan¹;Yixiao Zhu^{2*};Shikui Shen^{3*};Yu Qin^{4;5};Tianchi Zhong¹;Limin Xiao⁴;Yichun Shen⁵;Zelin Wang³;Shuailuo Huang³;Xian Zhou⁶;Fan Zhang^{1;7*}

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An absorption-aware TR-MLSE receiver is demonstrated for 64-GBaud 16QAM transmission over 25-km hollow-core fiber, using notch-matched target-response equalization to mitigate gas-line absorption, improve BER performance, and substantially reduce adaptive-equalization complexity without transmitter-side spectral shaping.

ACP2026-0723-4

Bidirectional High-Capacity Integrated Sensing and Communication Emulation Using Interconnected Counter-Propagating Recirculating Loops

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We demonstrate a bidirectional WDM integrated sensing and communication system using interconnected counter-propagating recirculating loops emulating long-haul fiber links, achieving 6.016-Tbps transmission over 2187.72 km, and DAS sensing with 1.85-km spatial resolution and over 15-dB sensing SNR.

ACP2026-0715-123

Thin-Film Lithium Niobate Reconstructive Spectrometer Based on Long-Period-Grating-Enabled Multimode Interference

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We demonstrate an electro-optic thin-film lithium niobate reconstructive spectrometer using cascaded long-period gratings and multimode phase shifters for low-correlation spectral encoding, achieving 165-nm bandwidth, 0.08-nm resolution, a 100-kHz scanning speed, and 0.12-mW average power consumption.

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