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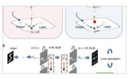
Bio-inspired backpropagation-free training for optical neural networks

Tingxuan Li, Yibo Dong ... Jing Wang



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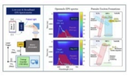
Investigating degradation mechanisms in organic light-emitting diodes using operando electrically pumped spectroscopy

An integrated operando EPS-based spectroscopic framework enables layer-resolved visualization of exciton dynamics in OLEDs, providing direct insight into degradation pathways under electrical bias.

Chang Min Lee, Hyun Jae Lee ... Seung Yoon Ryu



Review Article
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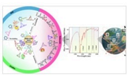
Spin-photon qubits for scalable quantum network

Spin-photon qubits from solid-state quantum emitters, especially telecom-band silicon color centers, combine matured fabrication with low-loss fiber links, enabling scalable quantum computing, memories, repeaters, and global secure quantum communication networks.

Md Sakibul Islam, Kuldeep Singh ... Wayesh Qarony



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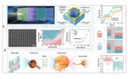
Quasi-bound states in the continuum driven photoresponse in multiple quantum wells for machine vision

Wenjuan Zhou, Jun Deng ... Junhao Chu



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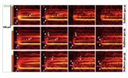
Two-photon 3D imaging of optically stimulated neural activity at 100 Hz

Dual-view Bessel two-photon projection microscopy imaged 3D calcium signals in brain tissue at 100 Hz, revealing 5–40 Hz neuronal calcium transients traveling bi-directionally along the dendrite following two-photon glutamate uncaging.

Dongli Xu, Fuu-Jiun Hwang ... Leilei Peng



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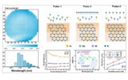
Weak polarization electric field III-N LEDs on polar plane with enhanced efficiency and strong lateral carrier confinement

Wafer-scale weak-PEF LEDs on polar c-plane exhibit the highest EQE of its kind through optimized digital-alloy barrier growth, with great wavelength stability and strong lateral carrier confinement.

Jingkai Zhao, Changcai Zuo ... Yuantao Zhang



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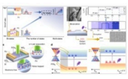
Dual-mode switchable and reconfigurable Van der Waals phototransistor for multi-state image encryption

Yuanfang Yu, Senyao Tang ... Li Gao



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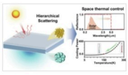
Bi-layer photonic random meta-composite for cryogenic thermal control by ultra-broadband scattering matched reflectance

A bi-layer meta-composite enables cryogenic space thermal control via hierarchical scattering in an ultra-broadband wavelength range.

Hongchao Li, Hexiang Han ... Di Zhang



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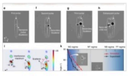
Interferometric scattering for optical tomoslicing of transparent solids

Yuan Chai, Hong-Hua Fang ... Hong-Bo Sun



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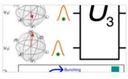
Experimental observation of counter-intuitive features of photonic bunching

Giovanni Rodari, Carlos Fernandes ... Fabio Sciarrino



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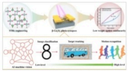
Two-terminal β-Ga_2O_3 photo-synapse for diversified in-sensor computing via self-trapped holes engineering

β-Ga_2O_3 photo-synapses based on self-trapped holes engineering exhibited a low weight update nonlinearity of 0.42, thereby enabling multiple machine vision tasks from low-level image classification to high-level motion recognition.

Yiyin Nie, Shujie Jiao ... Liancheng Zhao



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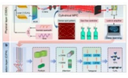
High-speed and high-sensitivity multi-gas detection based on parallel heterodyne LITES sensor

Haiyue Sun, Shunda Qiao ... Yufei Ma



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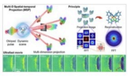
Multi-dimensional spatial-temporal projection ultrafast compressed imaging

An ultrafast compressed imaging technique utilizing multi-dimensional spatial-temporal projection can achieve isotropic reconstruction, successfully observing complex transient phenomena with sub-micron resolution and ultra-high sequence depth.

Yizhao Meng, Pengfei Zhang ... Feng Chen



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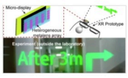
Expanded field of view light-field extended-reality displays with metalens array

XR 3D display prototype achieves VAC-free experience via unique heterogeneous metalens array, offering extended FOV for next-gen AI glasses and outdoor navigation in smart wearables.

Wen-Long Lu, Yang Yi ... Jian-Wen Dong



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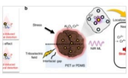
Dopant-localized mechanoluminescence in simple oxides

Ankoji Parvathala, Soo Ha Lee ... Hyosung Choi



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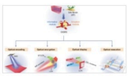
Reading, decrypting, and actuating with light in soft-robotic materials

Sieun Jeon & Dong Ki Yoon



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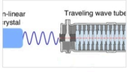
Surpassing kilometer-scale terahertz wireless communication beyond 300 GHz enabled by hybrid photonic–electronic synergy

Mikhail Gorbun & Georgy Fedorov



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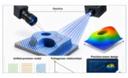
Towards theoretical foundation for high-precision fringe projection profilometry system design and optimization

Song Zhang



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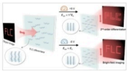
Reconfigurable ferroelectric chiral nanostructures enable fast-switchable optical spatial differentiation

We propose a reconfigurable space-variant ferroelectric chiral nanostructure to dynamically control the optical differentiation. Via switching the polarity of external electric field, spatial differentiation or bright-field imaging can be actively selected with an ultra-short response time. This work advances the ingenious building of ferroelectric nanostructures, and offers an important glimpse into their potential in neuromorphic photonics, biomedical microscopy and artificial intelligence.

Wen Chen, Dong Zhu ... Peng Chen



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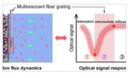
Operando tracking of ion kinetics and state-of-charge via multiresonant fiber-optic grating sensors in sodium-ion batteries

Operando monitoring of interfacial ion kinetics and real-time accurate state-of-charge quantification in sodium-ion batteries has been achieved using a compact multiresonant fiber-optic grating sensor.

Xile Han, Jinliang Li ... Tuan Guo



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