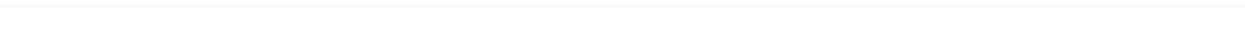


ADVANCED OPTICAL MATERIALS

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Simplified Deep Learning Driven Design of Blue Light Grating Couplers (Advanced Optical Materials 20(2026))

Lei hao Sun, Yiming Zhang, Chaowen Guan, Minghao Huang, Bohan Xiao, Yunkai Shao, Zengxin Li, Jianyang Shi, Zwei Li, Junwen Zhang, Nan Chi, Chao Shen

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CORRECTION

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Correction to "Donor-Acceptor Structure Induced Long-Persistent Luminescence and Application in Temperature Measurement at Cryogenic Environment"

e71275 | First Published: 11 May 2026

[This article corrects the following:](#)

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RESEARCH ARTICLE

Simplified Deep Learning Driven Design of Blue Light Grating Couplers

Lei hao Sun, Yiming Zhang, Chaowen Guan, Minghao Huang, Bohan Xiao, Yunkai Shao, Zengxin Li, Jianyang Shi, Zwei Li, Junwen Zhang, Nan Chi, Chao Shen

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Abstract | Full text | PDF | References | Request permissions

Effect of Quantum Well Thickness on Long-Range Exciton Transport in Two-Dimensional Layered Perovskites

Jiayu Tan, Yixuan Zhou, Yue Wu, Yang Wu, Xukun Feng, De Li, Yuanyuan Huang, Xinlong Xu

e03764 | First Published: 30 April 2026



Abstract | Full text | PDF | References | Request permissions

Tailoring High-Temperature Co-Precipitation Synthesis of Nanoscintillators for High-Performance Dynamic X-ray Imaging

Xiao Xu, Weixin Xu, Xiaofeng Liu, Renren Deng, Min Zhou, Zicheng Wen, Jianrong Qiu

e71269 | First Published: 05 May 2026

We report a facile strategy for the optimization of scintillation properties in NaLuF₄:Tb/Gd nanoscintillators (NSs). Elevating the reaction temperature from 300°C to 320°C yields an enhancement in XEOL intensity along with a significant reduction in X-ray excited persistent luminescence (XEPL). The optimized NaLuF₄:Tb/Gd NSs were fabricated into a film, which exhibits excellent stability and enables high-resolution dynamic X-ray imaging.

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Molecular Engineering of a Tetradentate Pt(II) Emitter Enables Deep-Blue PHOLED with Ultra-Low Efficiency Roll-Off and Exceptional Brightness Stability

Kewei Xu, Zhibin Li, Jia Zhao, Chengyao Zhang, Feng Zhan, Weiwei Lou, Yun-Fang Yang, Yuanbin She, Guojie Li

e71270 | First Published: 05 May 2026

A novel, rigid, and sterically hindered tetradentate Pt(II) emitter (PtHW2) was developed via strategic molecular engineering. The bottom-emitting PHOLED based on PtHW2 simultaneously achieved a high J₅₀ of 20.4 mA m⁻² and a record-high L₅₀ of 5091 cd m⁻² with CIE_y < 0.20, demonstrating ultra-low efficiency roll-off and outstanding brightness stability.

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Bio-Inspired Multicolor and Red Afterglow LiNbO₃ Phosphors for Environment-Interactive Anti-Counterfeiting and Ratiometric Thermometry

Zhouyang Xia, Jiawen Wang, Ange Zhu, Wasfa Zulficar, Yujie Cheng, Shenlei Shi, Karol Bartosiewicz, Yan Li, Gongxun Bai

e71276 | First Published: 07 May 2026

Biologically inspired co-doped LiNbO₃:Pr³⁺/Dy³⁺ phosphors exhibit tunable luminescence under varying excitation wavelengths, temperatures, and times, enabling multimodal applications. Dy³⁺-mediated energy transfer and trap-assisted afterglow prolong the Pr³⁺ emission lifetime, while temperature-dependent luminescence, excitation-dependent color modulation, and near-infrared responsiveness demonstrate a multimodal luminescent system capable of anti-counterfeiting authentication, and optical sensing, highlighting its potential for and multifunctional applications.

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Near-Infrared Light-Responsive and Programmable Thermosensitive Crystal-Based MXene-Polymer Multilayers Composites as Water-Surface Bionic Insects

Haoqiang Qi, Wenbo Wu, Jiaxuan Zhi, Xue Bai, Hui Yu, Xin Huang, Dongyang Zhu, Na Wang, Ting Wang, Hongxun Hao

e71277 | First Published: 05 May 2026

A new paradigm for high-performance light-driven actuators is presented based on a hybrid strategy combining MXene with thermosensitive crystals. Remote near-infrared control over motion with tunable precision is achieved through photothermal conversion. Complex bioinspired motions—including self-spinning and helical trajectory following—emerge from the synergistic interplay of the Marangoni effect and thermosensitive strain, opening new avenues for programmable soft microrobotics, adaptive optics, and environmental sensing.

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High-Performance ε-Ga₂O₃ Photodetectors Based on Two-Step Growth to Expand Carrier Transport Paths for Solar-Blind Imaging Applications

Mengfan Xu, Qianqian Zhan, Linkai Yue, Yiyuan Liu, Xinrui Zhao, Wensiang Mu, Xiaohu Hou, Zhital Jia, Yang Li

e71278 | First Published: 08 May 2026

We have fabricated high-performance Ge-doped ε-Ga₂O₃ SBPD arrays by the two-step growth. Ge-doped ε-Ga₂O₃ SBPDs exhibit remarkable optical response performance photo-to-dark current ratio = 6.11 × 10⁷, Responsivity = 407.5 A/W, specific detectivity = 2.79 × 10¹⁴ Jones. Furthermore, a photodetector array (5 × 5) based on 2-rich Ge-doped ε-Ga₂O₃ epitaxial wafer is constructed with a clear image, high responsiveness, and significant uniformity of the array.

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Selective Reflection of Chiral Ferroelectric Nematic Liquid Crystals Tuned by Electric Field Along the Helix Axis

Md Sakawat Hossain Himel, Rohan Dharmarathna, James T. Gleeson, Robert J. Twieg, Samuel Sprunt, Antal Jákli

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It is demonstrated that in chiral ferroelectric nematic liquid crystals sandwiched between electrically conducting transparent plates, the reflection color can be reversibly tuned by electric fields applied along the helix axis. The proposed theoretical model, assuming field-induced coiling of the helix axis, accounts for all observations. These findings suggest potential applications in both tunable reflectors and energy-efficient smart windows.

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Photocyclization of Cationic Bay-Substituted Perylene Dimide Derivatives to Coronene Analogs Used as Lysozyme Targeted Type-II Photosensitizer

Lalmohan Das, Antara Panja, Ankan Kumar Sarkar, Nayana Mukherjee, Sourav Satapathi, Biman Jana, Nikhil Ranjan Jana, Sudip Malik

e71280 | First Published: 07 May 2026

In this work, we report the successful design of cationic perylene derivatives which transform to a coronene diimide-like backbone via light induced cyclization in the aqueous medium. These are non-toxic and localized into lysosome organelle. Generating extracellular or intracellular reactive oxygen species are demonstrating their potential as a novel photosensitizer in photodynamic therapy.

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Charge Compensation via Heterovalent Cation Disorder for Birefringence Modulation to Design UV Nonlinear Optical Crystal

Wenbin Zhang, Wenzhi Jin, Xiangcong Ma, Zhihua Yang, Fangfang Zhang, Shujuan Han, Shille Pan

e71281 | First Published: 05 May 2026

By employing a heterovalent cation-disorder strategy with Rb⁺/Ba²⁺ co-occupation, the packing of (B₂O₃) units is tuned from parallel into a unique zigzag arrangement. This structural modulation balances a moderate birefringence (0.075@532 nm) with a phase-matching SHG response and a short UV cutoff edge below 196 nm, offering a new approach to tailor borate-based UV nonlinear optical crystals.

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Multilayer Q-BIC-Like Optical Filters with High Throughput Direct-Write Multilayer Lithography

Ayse Bilgehan Baspinar, Philippe Pearson, Andrei Faraon

e71282 | First Published: 08 May 2026

A high-throughput direct write fabrication platform based on an antimony precursor is introduced for multilayer resonant metasurfaces. Multilayer q-BIC metasurfaces with independently tunable resonances are demonstrated, enabling compact multi-resonant optical filters. Decorrelated filter arrays are realized for compressive sensing and hyperspectral reconstruction, surpassing existing metasurface-based approaches.

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Fluorine-Free Colorless Polyimides with High Thermal Stability for Advanced Flexible Color Filters and Dye-Based Photolithography

Dongqian Wang, Qingze Pan, Jianwei Li, Wannian Zhang, Xiuchen Li, Xinyan Huang, Lingfeng Zheng, Junxiang Huang, Saran Long, Pengzhong Chen, Jiangli Fan

e71283 | First Published: 07 May 2026

A sustainable fluorine-free strategy is reported for developing colorless polyimides by engineering isomeric diamines with meta-substitutions and bulky fluorenyl groups. The resulting PI-1 exhibits 92.8% transmittance and a high T_g of 320°C. Combined with exceptional 200 000-cycle folding durability, it enables high-fidelity RGB pixel arrays via dye-based photolithography, offering a high-performance paradigm for flexible displays.

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Unlocking Controllable Multi-Band Emission from a Mn-Doped Spinel: Ranging from Narrow-Band Green to Efficient NIR

Shuwen Yin, Chuansheng Zhong, Xibao Zhang, Chenxue Wang, Qingtao Yang, Hongpeng You, Liang Zhou

e71284 | First Published: 08 May 2026

In a single MgAlGaO₄ spinel host, the manganese valence-state interionic interactions are regulated to achieve tunable multimode luminescence. Low doping produces a narrow-band green emission (FWHM = 27 nm). High doping induces Mn²⁺-Mn²⁺ dimers via exchange coupling, yielding broadband near-infrared emission with an external quantum efficiency of 56.8%.

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Efficient Broadband Short-Wave Infrared Luminescence at 1400 nm Enabled by Cr³⁺-Yb³⁺ Energy Shuttle Design

Lipeng Huang, Ruiqi Shi, Kaihui Zhang, Xulong Lv, Xihui Shan, Shihai Miao, Tao Wang, Yanjie Liang

e71285 | First Published: 08 May 2026

An efficient broadband short-wave infrared (SWIR) phosphor Yb₃Ga₅O₁₂:Cr³⁺, Ni²⁺ has been successfully developed, which delivers intense SWIR luminescence peaking at 1400 nm upon blue-light excitation with high internal/external quantum efficiency of 43.1%/23.1%, respectively.

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Full-Color Circularly Polarized Organic Afterglow Enabled by Tunable Triplet-State Chirality via a Cascade Confinement Strategy

Yonghui Sun, Li Zheng, Yuqing Shu, Yufei Song, Haohua Chen, Lingyu Zhao, Junbiao Chang, Pengyang Xin

e71286 | First Published: 08 May 2026

This study presents a cascade confinement strategy for constructing organic afterglow materials that simultaneously achieve high-efficiency phosphorescence, tunable circular polarization, and full-color emission. By integrating a fluorene-functionalized chiral phosphor with β-cyclodextrin host-guest complexation and polymer-matrix immobilization, the study demonstrates a hierarchical confinement approach that effectively suppresses nonradiative decay while enabling controlled modulation of triplet-state chirality.

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