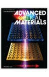
Advertisement
Find the right audiences for your ads. EXPLORE OUR REACH WILEY

ADVANCED OPTICAL MATERIALS



Advanced Optical Materials: Volume 14, Issue 37

9 October 2026

‹ Previous Issue

GO TO SECTION

Export Citation(s) | Download PDF(s)

COVER PICTURE

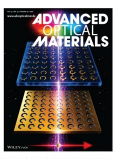
Free Access

Compact Terahertz Vortex Beam Source Based on Smith–Purcell Radiation and a Double-Layer Metasurface (Advanced Optical Materials 37/2026)

Pengtao Wang, Suguo Chen, Rui Wu, Gengyu Bai, Sunchao Huang, Xinmei Wang, Yue Wang

e71681 | First Published: 09 October 2026

This article relates to:



Smith–Purcell Radiation
The cover image depicts a double-layer C-ring metasurface under electron-beam excitation, where Smith–Purcell radiation generates terahertz vortex beams carrying orbital angular momentum. Layer I enhances radiation intensity via field superposition, while Layer II imparts dynamic and geometric phase modulation for precise OAM control. The design supports tunable frequencies and diverse polarizations, offering a promising platform for integrated terahertz photonic devices with multifunctional capabilities. More details can be found in the Research Article by Suguo Chen, Yue Wang, and co-workers (DOI: 10.1002/adom.71562).

Abstract | PDF | Request permissions

ISSUE INFORMATION

Free Access

Issue Information

e71682 | First Published: 09 October 2026

PDF | Request permissions

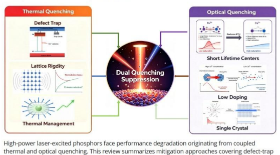
REVIEW

Full Access

Luminance Saturation in Luminescent Material: From Fundamental Mechanisms to Anti-Saturation Material Design

Yuhua Wang, Wenlei Cao, Yuhan Zhou, Runtian Kang

e71805 | First Published: 25 September 2026



High-power laser-excited phosphors face performance degradation originating from coupled thermal and optical quenching. This review summarizes mitigation approaches covering defect-trap engineering, lattice-rigidity tuning, thermal management, as well as optical-quenching suppression via lifetime modulation, doping optimization and single-crystal design for high-brightness laser-lighting phosphors. Illustration created in PPT combined with AI-generated elements (Doubao, ByteDance AI assistant; accessed September 2026). The final image was refined and annotated by the author. All figure details were cross-checked against the author's intended communication and reviewed for accuracy.

Abstract | Full text | ePub | PDF | References | Request permissions

RESEARCH ARTICLE

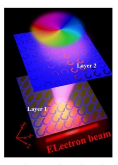
Full Access

Compact Terahertz Vortex Beam Source Based on Smith–Purcell Radiation and a Double-Layer Metasurface

Pengtao Wang, Suguo Chen, Rui Wu, Gengyu Bai, Sunchao Huang, Xinmei Wang, Yue Wang

e71562 | First Published: 08 August 2026

This article relates to:



In this work, the double-layer metasurface not only effectively enhances the Smith–Purcell radiation intensity, but also achieves modulation phase by designing the sorting method of the upper layer metasurface units. The purity of vortex rotation achieved by this method has been significantly improved.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

High-Performance Large-Format AlN-Based Vacuum Ultraviolet Imaging Detector

Zhengyi Yue, Lixin Zhang, Zhuogeng Lin, Kaikai Duan, Xin Zhang, Jun Wang, Wei Zheng, Chaofan Zhang

e71657 | First Published: 23 September 2026

VUV imaging enables clear observation of sub-100-nm objects without overcoming the diffraction limit. In this work, a high-performance 16 16 pixel AlN-based array detector is fabricated. In conjunction with a custom-designed readout circuit, VUV imaging is successfully achieved, and the visual quality of the images is further enhanced through algorithmic processing.

Abstract | Full text | ePub | PDF | References | Request permissions

Open Access

A Layered Two-Dimensional Hydrogen-Bonded Organic Framework Based on 2,5,8,11-Tetrakis(4-Carboxyphenyl)Perylene Diimide: Structural Nature, Optical and Photophysical Properties

Mario de la Hoz Tomás, Taito Hashimoto, Boiko Cohen, Yuzuki Murata, Kazuki Shiga, Ryota Hanyu, Ryusei Oketani, Norimitsu Tohnai, Ichiro Hisaki, Abderrazzak Douhal

e71719 | First Published: 11 September 2026

A novel hydrogen-bonded organic framework (HOF) based on perylene diimide (PDI) is synthesized, structurally and spectroscopically characterized. Its photophysical behavior highlights how supramolecular organizations govern the optical properties, including emission from monomers, aggregates, and excimer-like species. Structural transformations induced by solvent removal modify the luminescent properties of the material.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Fast-Responding Thermal Hydrogel Smart Windows for Energy-Efficient Buildings

Kegui Lu, Guang Chen, Wenshuo Zhang, Jiahao Ni, Yong Hao, Yezi You, Chongwen Zou, Gang Pei, Bin Zhao

e71723 | First Published: 25 September 2026

A fast-response strategy is developed for PNIPAm hydrogel window by doping cesium-tungsten oxide nanoparticles, which selectively absorbs near-infrared light and thereby enable a solar-thermal synergistic response mechanism. This yields superior response accuracy and marked building energy savings, offering a promising pathway for next-generation building envelopes.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Metal Ions Selectively Activate Emissive Centers in Carbon Dots, Triggering Color-Tunable Phosphorescence for Visual Detection

Jing Tan, Longtao Liu, Dian Wu, Yi Li, Peng Sha, Xingyu Gu, Songnan Qu, Zhiwen Jin, Haibo Zeng, Qijun Li, Jianning Ding

e71734 | First Published: 27 September 2026

A novel CD-based phosphorescent test paper with color-tunable "off–on" phosphorescence was developed through the competitive interplay between the heavy-atom effect and aggregation-induced quenching. This unique mechanism triggers a vivid color transition from orange to green, enabling precise and smartphone-assisted quantitative detection of trace Pb^{2+}.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Intrinsic Electric Field Driven High Sensitive Photodetection in Alloy TMDC MoSSe

Chumki Nayak, Suvadip Masanta, Shubhadip Moulick, Manotosh Pramanik, Atanu Kabiraj, Subhajit Mahapatra, Satchidananda Rath, Sukanya Ghosh, Atindra Nath Pal, Bipul Pal, Achintya Singha

e71740 | First Published: 21 September 2026

This study demonstrates that monolayer MoSSe, a polar TMDC with an inherent out-of-plane dipole moment confirmed by piezoelectric force microscopy and first-principles calculations, exhibits improved optoelectronic performance. The prolonged exciton lifetime facilitates enhanced charge separation. Furthermore, MoSSe exhibits broadband photodetection with tunable response speed via the photogating effect, highlighting its potential for future nanodevice applications.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Multimodal Synergistic Optical Encryption Using Holographic Cholesteric Liquid Crystal Polymer Composite Films

Songlan Zhao, Shuqi Ren, Aotian Li, Xuan Zhou, Ji-Liang Zhu

e71748 | First Published: 25 September 2026

A monolithic holographic cholesteric liquid crystal composite film enables cooperative multidimensional optical encryption by coupling thermally programmable structural color, dynamic holographic phase modulation, and stimulus-responsive fluorescence within a unified material platform. Thermal deformation of the polymer network simultaneously drives cholesteric pitch evolution and holographic grating deformation, enabling coordinated wavelength tuning and phase modulation, while the embedded fluorescent system provides an independent temperature- and stimulus-time-dependent authentication channel. The cooperative evolution of these complementary optical responses enables hierarchical, sequential decoding with enhanced information capacity and resistance to optical replication, offering a promising strategy for high-security anti-counterfeiting and optical information storage.

Abstract | Full text | ePub | PDF | References | Request permissions

Open Access

Freeform Light Routing in Nearly-Hyperuniform Slabs: Toward a General-Purpose Design Platform for Integrated Photonics

Timothy Amoah, Ali Vafa, Georgios Gkantzounis, Chenglong Wan, Kapil Debnath, Frédéric Gardès, Milan Milosevic, Weining Man, Marian Florescu

e71768 | First Published: 25 September 2026

Nearly hyperuniform disordered photonic slabs guide light along prescribed freeform pathways without relying on lattice symmetry. A pathway-first design embeds curved channels within a photonic bandgap hyperuniform network, maintaining high transmission through freeform bends. Simulations, silicon near-infrared measurements, and 3D-printed ceramic sample's field maps establish that the pathway-first HUD design preserves low-loss, confined guidance along prescribed freeform interconnects.

Abstract | Full text | ePub | PDF | References | Request permissions

Open Access

Turning Light Into Matter: Programmable Microstructures Via Dose Control in Two-Photon Polymerization

Michał Ziemczonok, Koen Vanmol

e71770 | First Published: 25 September 2026

This work augments two-photon polymerization with point-wise dose control, enabling structures with heterogeneous material properties such as refractive index. An open source toolbox and superior calibration methodology for the refractive index pave the way for bio-mimicking or numerically optimized structure designs, and enhance the synergy between 3D microfabrication and tomography.

Abstract | Full text | ePub | PDF | References | Request permissions

Open Access

Electrically Reconfigurable Optical Initialization of Spin Valley Polarization in Monolayer WS_2 Enabled by Switchable Dual-Mode Liquid Crystal Lasers

Yu-Chuan Tsao, Ya-Ping Hsieh, Yang-Fang Chen, Hui-Yu Chen

e71781 | First Published: 15 September 2026

This work presents an electrically controllable approach to spin–valley polarization in monolayer WS2 by integrating it with a dual-mode liquid crystal laser. Applying an external field triggers phase transitions that switch the laser emission between helicity-defined band-edge lasing and unpolarized random lasing. This reversible control directly governs valley polarization, enabling new possibilities for programmable valleytronic and quantum devices.

Abstract | Full text | ePub | PDF | References | Request permissions

Open Access

Wavelength-Multiplexed 2D Beam Steering via a Passive Diffractive Network

Che-Yung Shen, Yuhang Li, Çağatay Işıl, Tianyi Gan, Mona Jarrahi, Aydogan Ozcan

e71782 | First Published: 14 September 2026

Illustration of a wavelength-multiplexed diffractive beam steering system, which is composed of K cascaded diffractive layers, each containing phase-modulating elements that are jointly optimized using deep learning–based optimization. When illuminated with a set of wavelengths , the system projects N_w optical beams toward distinct and programmable angular positions at the output. An initial version of this artistic illustration was created using ChatGPT with the authors' text prompt, which was subsequently modified by the authors.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Harnessing Ultralong-Lived Triplet Excitons in Color-Tunable Carbon Dots for Multilayer Security Platform

Satendra Kumar, Pradip Pattanayak, Pradipta Purkayastha

e71783 | First Published: 12 September 2026

Precursor engineering strategy enables excited-state modulation in carbon dots derived from a single benzenic core. Controlled co-pyrolysis of urea with benzoic acid and methoxy-substituted derivatives systematically tunes the electron-donating character of the carbonizing precursor, thereby regulating electronic structure and triplet energy levels.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

A Water-Resistant Bi-Based Optoelectronic Synapse for Underwater Neuromorphic Vision

Yinghui Bai, Xinmiao Li, Yaqian Yang, Dan Kuang, Ying Li

e71784 | First Published: 11 September 2026

A water-resistant optoelectronic synapse is developed for underwater neuromorphic vision. The hydrophobic Rubrene layer suppresses water infiltration, preserving device integrity and performance. The device exhibits multi-spectral response, synaptic plasticity, and conditioned-reflex learning. Integrated with a neural network, the optoelectronic synaptic array achieves 95.89% accuracy in classifying aquatic organism motion trajectories, enabling intelligent visual perception in complex underwater environments.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Mixed-Dimensional GaN/AlN Microwires/Graphene/u-GaN Van der Waals Heterojunctions for High-Performance Hot-Electron Transistors and Ultraviolet Photodetectors

Guoxin Li, Zihan Deng, Shuaiqi Ding, Zhengdong Wu, Huan Wu, Wenrui Wu, Chao Liu, Fangliang Gao, Shuti Li

e71785 | First Published: 12 September 2026

Mixed-dimensional GaN/AlN microwire/graphene/u-GaN van der Waals heterojunctions are constructed for hot-electron transistors and ultraviolet photodetectors. The AlN tunneling barrier realizes effective cold-electron filtering. The device exhibits competitive ultraviolet photodetection performance, offering a feasible route for wide-bandgap optoelectronic-electronic integrated devices.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Decoupling Power and Polarization via Bipolar BP/MoS_2 Heterojunctions for Multidimensional Imaging

Kuanxin Chen, Qingguo Xu, Hongshun Zhang, Xiao Wang, Zhangcheng Liu, Zhiwei Chen, Jie You, Yang Li, Jinping Ao

e71786 | First Published: 24 September 2026

A compact, single-pixel near-infrared photodetector based on a bipolar BP/MoS_2 van der Waals heterojunction is developed. By engineering interfacial energy band alignments and leveraging an elliptical fitting algorithm, this device successfully decouples optical power from polarization states, enabling high-responsivity, low-power, and multidimensional polarimetric imaging at 1550 nm without complex optical components.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Resonance Energy Transfer-Driven Lasing Mode Switching Visualizes DNA Zippering in Real Time

Yiqian Fu, Jiahui Zhang, Jinping Zhang, Zunyi Qian, Hao Wang, Xiu-Hong Wang, Pu Wang

e71788 | First Published: 12 September 2026

This work develops a coupler-free microlaser platform that integrates resonance energy transfer (RET) with whispering-gallery-mode lasing. DNA hybridization recruits fluorescent acceptors to the microcavity interface, redistributing the donor–acceptor gain balance and triggering quantized mode hopping between adjacent WGM resonances. The resulting spectral signatures enable real-time kinetic tracking and mismatch discrimination in short oligonucleotides.

Abstract | Full text | ePub | PDF | References | Request permissions

Full Access

Ortho-Diboron Blue Multiple Resonance Thermally Activated Delayed Fluorescence Material

Yu Wang, Jia-Qi Xi, Si-Wei Wei, Yi Wei, Jia-Zhen Zhu, Shuai Xing, Li Yuan, You-Xuan Zheng

e71789 | First Published: 15 September 2026

The isolated *ortho*-diboron strategy with partially offset frontier molecular orbitals is successfully employed to develop a blue multi-resonance thermally activated delayed fluorescence material. The fabricated thermally activated sensitized fluorescence organic light-emitting diode demonstrates blue emission with a peak at 464 nm, accompanied by a remarkable maximum external quantum efficiency of 34.9% with low efficiency roll-off at 1000 cd m^{-2}.

Abstract | Full text | ePub | PDF | References | Request permissions

1 2 3 ›

Sign up for email alerts

Enter your email to receive alerts when new articles and issues are published.

Email address
Enter email
Continue

Submit an article
Subscribe to this journal
Journal Metrics

Advertisement
WILEY Reach target audiences where they go for knowledge CONNECT WITH US

Related Titles

- Advanced Science
- Laser & Photonics Reviews
- Nanophotonics
- physica status solidi (RRL)
- Advanced Quantum Technologies
- Advanced Physics Research
- Advanced Photonics Research
- Advanced Electronic Materials
- Annalen der Physik
- Crystal Research and Technology
- Fortschritte der Physik - Progress of Physics

Advertisement

pro-physik Stellenmarkt
d-fine Recruiting Events Deutschland Stellenanbieter: d-fine GmbH
Als Physiker*in ins München (Stadt), Bayern Stellenanbieter: Basycon
PhD Student or Postdoc Göttingen (Stadt), Stellenanbieter: Max-Planck-
PostDoc Position (f/m/d) in München (Stadt), Bayern Stellenanbieter: Technische
Distinguished PKS Deutschland Stellenanbieter: Max-Planck-
Mehr Jobs ▶

WILEY ADVANCED
Contact the Advanced Team

All Journals
Multidisciplinary
Advanced Science
Physical Sciences
Broad Scope Materials Science
Advanced Materials
Advanced Functional Materials
Advanced Materials Interfaces
Energy & Sustainability Science
Advanced Energy Materials
Advanced Sustainable Systems
Advanced Energy and Sustainability Research
Advanced Synthesis and Catalysis
Advanced Chemical Engineering
Engineering & Technology
Advanced Engineering Materials
Advanced Materials Technologies
Advanced Sensor Research
Physics, Photonics & Electronics
Advanced Optical Materials
Advanced Quantum Technologies
Advanced Physics Research
Advanced Photonics Research
Advanced Electronic Materials

AI, Robotics & Theory
Advanced Intelligent Systems
Advanced Computing
Advanced Robotics Research
Advanced Intelligent Discovery
Advanced Theory and Simulation
Biomedical Engineering & Therapeutics
Advanced Healthcare Materials
Advanced Therapeutics
Advanced NanoBiomed Research
Life & Health Science
Advanced Biology
Advanced Genetics
Advanced Oncology
Advanced Brain
Advanced Immunology
Advanced Healthy Aging
Advanced Medicine

ABOUT WILEY ONLINE LIBRARY
Privacy Policy
Terms of Use
About Cookies
Manage Cookies
Accessibility
Wiley Research DE&I Statement and Publishing Policies

HELP & SUPPORT
Contact Us
Training and Support
DMCA & Reporting Piracy
Sitemap

OPPORTUNITIES
Subscription Agents
Advertisers & Corporate Partners

CONNECT WITH WILEY
The Wiley Network
Wiley Press Room

WILEY

Copyright © 1999-2026 John Wiley & Sons, Inc or related companies. All rights reserved, including rights for text and data mining and training of artificial intelligence technologies or similar technologies.