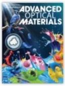
Advertisement

Ad closed by Google

ADVANCED OPTICAL MATERIALS



Advanced Optical Materials: Volume 13, Issue 6

February 24, 2025

‹ Previous Issue

GO TO SECTION

Export Citation(s) Download PDF(s)

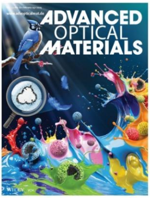
Cover Picture

Free Access

Bio-Inspired Bright Non-Iridescent Structurally Colored Nanopigments Featuring Additive Color Mixing Performance (Advanced Optical Materials 6/2025)

Wentao Wang, Wenzhen Zhang, Yicheng Zhou, Yuyuan Yao, Bingtao Tang, Liming Ding

2570059 | First Published: 24 February 2025



Photonic Pigments
Inspired by the Steller's jay, non-iridescent structurally colored nanopigments composed of hollow SiO_2 microspheres with amorphous carbon on the inner wall of the shell and disordered metasurfaces on the shell layer were created. Different from previous studies, each individual microsphere is an independent chromogenic unit and has additive color mixing performance. More details can be found in article 2402324 by Wentao Wang, Liming Ding, and co-workers.

Abstract | PDF | Request permissions

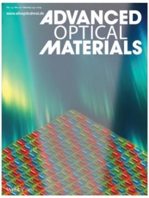
Inside Front Cover

Free Access

Exploring Strategies for Performance Enhancement in Micro-LEDs: a Synoptic Review of III-V Semiconductor Technology (Advanced Optical Materials 6/2025)

Driss Mouloua, Michael Martin, Miguel Beruete, Christophe Jany, Karim Hassan, Thierry Baron

2570060 | First Published: 24 February 2025



Semiconductor Technology
In article 2402777, Driss Mouloua, Thierry Baron, and co-workers explore various strategies to enhance the performance of Micro-light-emitting diode (Micro-LED) technologies, including passivation, distributed Bragg reflectors, metamaterials, plasmonics, and two-dimensional materials. The paper also examines fabrication and integration techniques, key factors such as external quantum efficiency, emission wavelength, and electrical injection, and discusses applications and future directions.

Abstract | PDF | Request permissions

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

ADVANCED SCIENCE NEWS

Advertisement

WILEY
Special issue call for papers!
Sustainable multi-functional materials for energy and environmental application
Learn more

Related Titles

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

Advertisement

WILEY
Streamline component identification with the power of KnowItAll LC Expert
Learn more

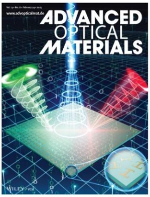
Back Cover

Free Access

Independent and Free Control of Multiple Beams Enabled by Wideband Spin-Decoupled Metasurface (Advanced Optical Materials 6/2025)

Fengxia Li, Xiaohan Yin, Jia-Yuan Yin, Jing-Ya Deng

2570061 | First Published: 24 February 2025



Spin-Decoupled Metasurface

In article 2401777, Jing-Ya Deng and co-workers propose a spin-decoupled strategy to generate multiple beams based on polarization conversion meta-atom by regulating its cross-polarized components. Combining propagation and PB phases, the deflection angles, polarizations, and topological charges can be independently and freely controlled in wideband, which can be utilized to polarization multiplexing and multichannel meta-devices in communication, imaging, and target detection.

Abstract | **PDF** | **Request permissions**

Issue Information

Free Access

Issue Information

2570062 | First Published: 24 February 2025

PDF | **Request permissions**

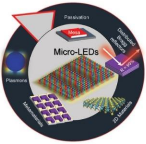
Review

Open Access

Exploring Strategies for Performance Enhancement in Micro-LEDs: a Synoptic Review of III-V Semiconductor Technology

Driss Mouloua, Michael Martin, Miguel Beruete, Christophe Jany, Karim Hassan, Thierry Baron

2402777 | First Published: 26 December 2024



III-V semiconductors, known for their exceptional optoelectronic properties, are critical in advancing Micro-light-emitting diode (Micro-LED) technologies. This review explores strategies to enhance performance, including passivation, distributed Bragg reflectors (DBRs), metamaterials, plasmonics, and two-dimensional (2D) materials. It also covers fabrication techniques and key factors such as external quantum efficiency (EQE), emission wavelength, and electrical injection, along with applications and future directions, spanning from deep-ultraviolet (DUV) to long-wavelength infrared (LWIR).

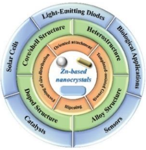
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Colloidal Zn-based Semiconductor Nanocrystals: Recent Advances and Challenges

Chao Li, Shuping Zhang, Yang Yang, Cuifang Wang, Bing Bai, Hsien-Yi Hsu, Zongyou Yin, Mark A. Buntine, Zongping Shao, Huabin Zhang, Ziyun Wang, Guohua Jia

2402510 | First Published: 30 December 2024



Zn-based semiconductor NCs with isotropic and anisotropic morphologies, such as quantum dots, nanorods, and nanoplatelets, can be achieved by growth mechanisms, such as oriented attachment, templated-assisted growth, ripening, and focusing of size distribution. By the constructions of core–shell, hetero-, alloy, and doped structures, the photoelectric properties of Zn-based NCs can be mediated, which inspires various novel applications.

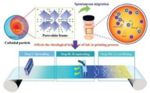
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Research Progress of Colloidal Chemistry and Rheological Dynamics for Printable Perovskite Photovoltaics

Chenxiang Gong, Cong Wang, Baojin Fan, Xiangchuan Meng, Siyi Shi, Ting Hu, Xiaotian Hu, Yiwang Chen

2402521 | First Published: 31 December 2024



The rheological behavior of perovskite colloidal particles in the ink and printing process is elucidated to comprehend the impact of changes in rheological behavior on the crystal quality of perovskite films, and summarized are specific mechanisms underlying the rheological behavior of perovskite colloidal particles. Ultimately, a future process improvement concept is put forward based on the perovskite ink's printing rheology.

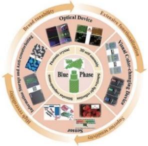
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Self-Assembled 3D Blue Phase Liquid Crystals for Intelligent Photonic Crystals and Functional Devices

Meng Wang, Hui Yang, Xiaosong Li, Xia Zhang, Huai Yang

2402581 | First Published: 17 January 2025



Blue phase liquid crystals (BPLCs), with their distinctive 3D self-assembly and stimulus-responsive properties, are driving innovation in smart materials. This review details key advancements in BPLC photonic crystals, focusing on applications in intelligent color changing devices, adaptive optical devices, visual sensors, and anti-counterfeiting technologies, offering valuable insights for interdisciplinary researchers.

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

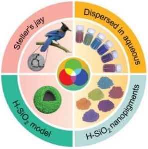
Research Article

Full Access

Bio-Inspired Bright Non-Iridescent Structurally Colored Nanopigments Featuring Additive Color Mixing Performance

Wentao Wang, Wenzhen Zhang, Yicheng Zhou, Yuyuan Yao, Bingtao Tang, Liming Ding

2402324 | First Published: 13 November 2024



Inspired by the Steller's jay, non-iridescent structurally colored nanopigments composed of hollow SiO_2 microspheres with amorphous carbon on the inner wall of the shell and disordered metasurfaces on the shell layer are created. Different from previous studies, every individual microsphere is the independent chromogenic unit and without any assembly process.

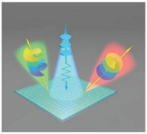
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Independent and Free Control of Multiple Beams Enabled by Wideband Spin-Decoupled Metasurface

Fengxia Li, Xiaohan Yin, Jia-Yuan Yin, Jing-Ya Deng

2401777 | First Published: 29 November 2024



A spin-decoupled strategy is proposed by Fengxia Li and co-workers, it is used to generate multiple beams based on polarization conversion meta-atom by regulating its cross-polarized components. The deflection angles, polarization, and modes can be independently and freely controlled in wideband, which can be utilized for polarization multiplexing and multichannel meta-devices in communication, imaging, and target detection.

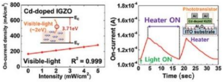
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Heater-Embedded Visible-Light Phototransistor Based on Cd-Doped IGZO Film Fabricated through Microwave-Assisted Sol–Gel Process

Eun-Ha Kim, Tae-Jun Ha

2402171 | First Published: 29 November 2024



A heater-embedded visible-light phototransistor with a Cd-doped IGZO sensing channel on a dual-purpose ITO substrate is demonstrated via a one-step microwave-assisted sol–gel process. Cd doping results in reduced bandgap and increased density of subgap states, enabling visible-light absorption. The embedded Joule heater significantly improves the recovery characteristics upon heating.

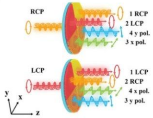
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Spin Decoupling Metasurfaces for Four-Channel Terahertz Wavefront Shaping

Qianyun Zhang, Guibin Li, Liang Wu, Zhen Yue, Fan Yang, Qiankun Zhang, Hui Li, Chenglong Zheng, Quan Xu, Jiaguang Han, Yan Zhang, Li Li, Jianquan Yao

2402265 | First Published: 06 December 2024



The proposed spin decoupling metalens can achieve four-channel terahertz wavefront shaping. The scheme of chip-integrated multi-section metalens geometries operates simultaneously with efficient focusing and orthogonal polarization manipulation. The co-polarized and cross-polarized components conversion can be independently engineered under circularly polarized incidence. The metalens realize the polarization conversion in four independent channels under either left- or right-handed circular incidence. The results suggest promising applications for high-capacity and high-security terahertz communication.

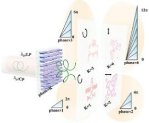
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Multi-fold Phase Metasurface Holography Based on Frequency and Hybrid Decoupling Polarizations

Hongqiang Zhou, Chongli Zhao, Cong He, Qiang Jiang, Hongbo Wang, Ruizhe Zhao, Tianlong Man, Yuhong Wan, Guangzhou Geng, Lingling Huang

2402303 | First Published: 28 January 2025



Multi-fold phase holography can be achieved by ingeniously integrating metasurface-based optical frequency switching with hybrid decoupled circular and linear polarization states. Through an adaptive momentum algorithm, the original holographic phase distribution can be precisely inverse-optimized. This innovative technology holds significant potential for advancing dynamic multi-fold beam directional refraction, vortex beam communication, optical encryption and camouflage, light switching, and beam shaping.

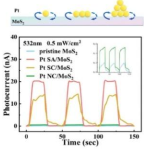
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Manipulating Carrier Behavior by the Size Effect of Decoration in MoS_2 Photodetectors

Xinzi Xu, Ran Duan, Weihong Qi, Xuqing Liu, Weimin Liu

2402368 | First Published: 04 February 2025



Pt single atoms, Pt single-layer clusters, and Pt nanoclusters are prepared to decorate MoS_2 photodetectors. The decorations adjusted the band structures of the MoS_2 photodetectors. Pt nanostructures play a role in suppressing carrier recombination, which enables devices to achieve good performance. Pt nanostructures also triggered the photogating effect, which improved carrier utilization.

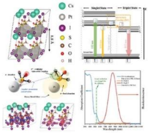
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Open Access

Stabilizing 2D Pt-Based Halide Perovskites via Solvent Lone Pair Donation

Huilong Liu, Maitreyo Biswas, Walter J. Smith, Edward Barnard, Thomas Beechem, Arun Mannodi-Kanakkithodi, Shubhra Bansal

2402435 | First Published: 24 October 2024



A simple method for synthesizing 2D platinum-based halide perovskite is introduced. Within this structure, the distinctive DMSO-Pt coordination (via k-s mode) confers stability in the 2D form, contrasting with the 0D and unstable 3D structures reported. Furthermore, this unique coordination promotes intersystem crossing (ISC), enabling the transition of singlet to triplet excitons and the resultant triplet exciton generation and emission.

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

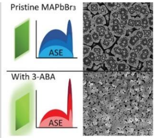
Open Access

Ligand-Induced Crystallization Control in $MAPbBr_3$ Hybrid Perovskites for High Quality Nanostructured Films

Markus W. Heindl, Michael F. Lichtenegger, Tim Kodalle, Shangpu Liu, Nasrin Solhtalab, Jonathan Zerhoch, Andrii Shcherbakov, Milan Kivala, Carolin M. Sutter-Fella, Alexander S. Urban, Felix

Deschler

2402441 | First Published: 05 February 2025



A bifunctional amino acid is used to slow down the formation process of perovskite thin films while simultaneously suppressing luminescence-quenching agglomeration effects, allowing for a much more controlled crystallization process. The result are highly crystalline thin films with cube-shaped grains in the nanometer-scale that display both bright emission and reduced thresholds for amplified spontaneous emission.

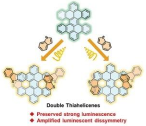
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Hexabenzoperylene-Cored Double Thiahelicenes with Strong Luminescence

Yuying Ma, Long Zhou, Jingyun Tan, Wang Sun, Yingping Zou, Yunbin Hu

2402446 | First Published: 16 December 2024


Double Thiahelicenes
◆ Preserved strong luminescence
◆ Amplified luminescent dissymmetry

A novel strategy to design highly luminescent thiahelicenes by fusing thiophene-containing moieties with a hexabenzoperylene (HBP) core, synthesizing two isomeric HBP-cored double thiahelicenes is developed. These molecules achieve exceptionally high fluorescence quantum yields and enhance luminescence dissymmetry factors, establishing a new pathway for high-performance circularly polarized luminescence materials based on thiahelicenes.

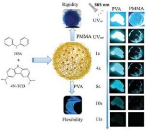
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Achieving Efficient Blue Room-Temperature Phosphorescence Through Self-Doping of Similar Structures and Polymer Assistance

Xiaoqiang Zhao, Xiao He, Yide Gao, Song Liang, Guangyu Wen, Bo Wang, Kun Gong, Wenhui Feng, Denghui Ji

2402452 | First Published: 28 January 2025



The blue room-temperature phosphorescence material which can be excited by 365 nm ultraviolet light was constructed by self-doping of similar structure strategy. More importantly, the flexibility and rigidity of the materials are improved through polymer assistance.

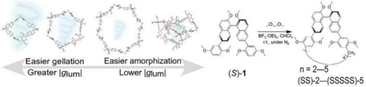
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Chiral Binaphthyl[n]arene Gel: Controlled Gelation Ability and Stepwise Amplification of Circularly Polarized Luminescence

Zhihong Sun, Jintian Zhong, Hao Tang, Lingyun Wang, Derong Cao

2402460 | First Published: 31 December 2024



A series of binaphthyl-based macrocycles with different cavity size are synthesized by one-pot reaction. Larger macrocyclic homologs of binaphthyl[4]arene and binaphthyl[5]arene behave similar to the monomer (*R*)/(*S*)-**1**, whereas the smaller macrocyclic homologs of binaphthyl[2]arene and binaphthyl[3]arene exhibit distinct behaviors including chiral amplification in CPL and gelation ability.

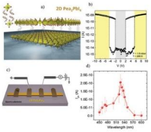
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Open Access

Photoconduction in 2D Single-Crystal Hybrid Perovskites

Valeria Demontis, Ofelia Durante, Daniela Marongiu, Sebastiano De Stefano, Selene Matta, Angelica Simbula, Carlotta Ragazzo Capello, Giovanni Pennelli, Francesco Quochi, Michele Saba, Antonio Di Bartolomeo, Andrea Mura, Giovanni Bongiovanni

2402469 | First Published: 06 December 2024



The photoconductive properties of 2D hybrid perovskite thin-film single crystals grown via spaceconfinement are investigated. The study reveals an ultralow dark current and suppressed ion migration, with exciton dissociation identified as a primary mechanism influencing photoconduction. Additionally, the device exhibits notable stability in performance under prolonged air exposure and illumination.

Abstract | Full text | PDF | References | Request permissions

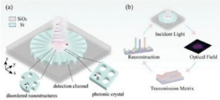
---

Full Access

Monolithic Integrated Multi-Parameter Light-Field Sensor Based on Tailored Disordered Nanostructures

Yingli Ha, Lijun Wang, Yinghui Guo, Mingbo Pu, Senwei She, Zhenyu Liu, Mingfeng Xu, Fei Zhang, Xiangang Luo

2402509 | First Published: 30 January 2025



This work proposes and validates a compact multi-parameter on-chip light-field sensor based on disordered nanostructures, enabling precise detection of incident angle, wavelength, and polarization with a single device. It measures multiple optical parameters without altering device form, equipment, or optical path alignment, significantly extending existing methods. The integrated design enhances system efficiency and flexibility, enabling advanced applications with a single device.

Abstract | Full text | PDF | References | Request permissions

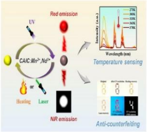
---

Full Access

Visible to Near-Infrared Luminescence and Reversible Photochromism in Mn^{2+}/Nd^{3+} Co-Doped Double Perovskite for Versatile Applications

Ruichen Xu, Biao Zheng, Xiaochen Fang, Xiaolong Sun, Jinquan Hong, Hai Huang, Weiguo Wang, Jun Wang

2402515 | First Published: 28 January 2025



Mn^{2+}/Nd^{3+} co-doped $Cs_2AgInCl_6$ (CAIC) double perovskites exhibit visible to near-infrared (NIR) luminescence and reversible photochromic properties. Utilizing the different temperature-dependent Mn^{2+} and Nd^{3+} luminescence, the sample demonstrates precise temperature sensing with high sensitivity based on the fluorescence intensity ratio method. Besides, the integration of photochromic color change, visible red emission, and NIR luminescence in a single material offers a multilevel anti-counterfeiting strategy.

Abstract | Full text | PDF | References | Request permissions

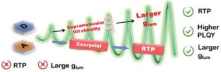
---

Full Access

A Chiral Cocrystal Strategy Producing Room-Temperature Phosphorescence and Enhancing Circularly Polarized Luminescence

Chenfei Yang, Siyao Fu, Shouzhen Li, Fei Li, Yi Su, Tingting Li, Huapeng Liu, Xiaotao Zhang, Wenping Hu

2402522 | First Published: 06 December 2024



Cocrystals with circularly polarized room-temperature phosphorescence (CP-RTP) emission are prepared, and simultaneous enhancement of phosphorescence photoluminescence quantum yield (PLQY) and luminescence dissymmetry factor (g_{lum}) is achieved. Polyvinyl alcohol (PVA) films doped with these cocrystals show the potential for multilevel information encryption.

Abstract | Full text | PDF | References | Request permissions

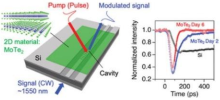
---

Open Access

Hybrid Silicon All-Optical Switching Devices Integrated with 2D Material

Daiki Yamashita, Nan Fang, Shun Fujii, Yuichiro K. Kato

2402531 | First Published: 25 December 2024



Hybrid all-optical switching devices combining silicon nanocavities and 2D molybdenum ditelluride ($MoTe_2$) are demonstrated. By exploiting refractive index modulation caused by photo-induced carriers in $MoTe_2$, these devices overcome the switching speed limitation imposed by the carrier lifetime of silicon, achieving switching speeds of tens of picoseconds with low switching energies of a few hundred femtojoules.

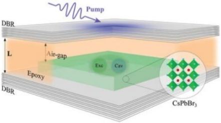
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Room Temperature Broadband Polariton Lasing from a $CsPbBr_3$ Perovskite Plate

Maksim D. Kolker, Ivan I. Krasionov, Anton D. Putintsev, Ekaterina D. Grayfer, Tamsin Cookson, Dmitry Tatarinov, Anatoly P. Pushkarev, Denis A. Sannikov, Pavlos G. Lagoudakis

2402543 | First Published: 31 December 2024



Tunable polariton lasing is demonstrated from a $CsPbBr_3$ perovskite microcrystal plate, spanning 23 nm in the green spectrum at room temperature. Simultaneous polariton condensation is observed into two orthogonally polarized branches, driven by the crystal's anisotropy, whilst by adjusting a multi-lambda planar microcavity, spectral tuning of the polariton emission is controlled.

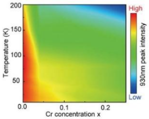
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Optical Detection of Weak Magnetic Transitions via Photoluminescence in Cr-Doped Van Der Waals Antiferromagnets

Yuntong Xing, Hongjing Chen, Aoyu Zhang, Qinghua Hao, Menghao Cai, Wenzhanhong Chen, Longde Li, Ding Peng, Anji Yi, Manman Huang, Xia Wang, Junbo Han

2402549 | First Published: 13 December 2024



This work shows the change of luminescence of Crdoped $MnPS_3$. The correlation between luminescence and magnetism is revealed by comparison with $MnPS_3$ luminescence and magnetic measurements. Even at very weak magnetism (cannot be detected by magnetic moment measurements), the luminescence shows a significant shift.

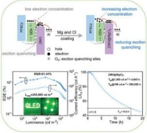
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

High-Efficiency and Stable Green InP-QLED Enabled by Lowering Electron Injection Barrier

Mengyuan Chen, Qian Li, Yangyang Bian, Shuaibing Wang, Binbin Hu, Aiwei Tang, Fei Chen, Yanbing Lv, Huaibin Shen

2402555 | First Published: 30 December 2024


low electron concentration
PFBCz
QDs
ZMO
Al
Mg and Cl coating
increasing electron concentration
ZMO@MgCl2
reducing exciton quenching
exciton quenching
hole
electron
Oₕ: exciton quenching sites
EQE=21.43%
EQE (%)
Current efficiency (cd A⁻¹)
Luminance (cd m⁻²)
QLED
L/L₀ (%)
Time (h)
ZMO@MgCl2

The large electron injection barrier and severe exciton quenching caused by defect states of ZMO nanoparticles (NPs) lead to lower electron concentration in the emitting layer. In this study, with the $MgCl_2$ surface passivation on ZMO, a high peak EQE of 21.43% and a long T_{50}@1000 cd m^{-2} of over 4 600 h is achieved for green InP-based QLEDs.

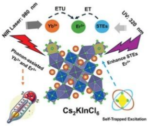
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Lanthanides-Induced Enhancement in Self-Trapped Excitons Emission and Anti-Thermal Quenching of Cs_2KInCl_6 for Highly Sensitive Optical Thermometry

Yihan Liu, Zhichao Zhang, Yingjie Mao, Kai Liu, Denghui Xu, Dan Liu, Xiong Li, Jun Zhou

2402556 | First Published: 29 December 2024



Using lanthanide ions doping strategy, Cs_2KInCl_6:Yb^{3+},Er^{3+} double perovskites are fabricated with improved self-trapped excitons emission, anti-thermal quenching performance as well as high sensitivity, and reproducibility for optical thermometry.

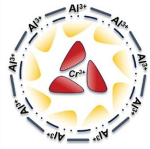
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Persistent Luminescence for Night-Time Individual Identification Based on Quantum Tunneling

Zaisheng Wen, Shengqiang Liu, Yuchen Zhang, Ting Wang, Zhen Song, Quanlin Liu

2402557 | First Published: 18 November 2024



By co-doping lanthanide ions and constitutional modulation, the afterglow signal can be clearly traced in the night-time device over 144 h. This work aims to accelerate the applications in night-time monitoring and recognition.

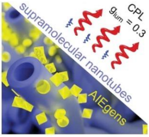
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Highly Dissymmetric Circularly Polarized Luminescence via Multimode Chirality Enhancement in Hierarchically Ordered Liquid Crystal Films

Mateusz Pawlak, Adam Pierzchała, Elie Benchimol, Jacopo Tessarolo, Lukas Rebholz, Marjan Krstić, Benedikt Zerulla, Ivan Fernandez-Corbaton, Tamás Jávorfi, Giuliano Siligardi, Guido H. Clever, Carsten Rockstuhl, Wiktor Lewandowski

2402483 | First Published: 26 December 2024



Highly circularly polarised luminescence (CPL) is achieved by combining achiral aggregation-induced emission fluorogens (AIEgens) with chiral, supramolecular nanotubes. This phenomenon is enabled by the hierarchical enhancement of chiroptical properties from single molecules to individual nanotubes and, finally, superstructures formed by nanotubes in the thin film. The matrix-induced CPL of dyes reached g_{lum} values of the order of 0.3.

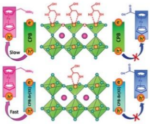
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Mapping Binding Sites for Efficient Hole Extraction in Lead Halide Perovskites through Sulfur-Based Ligand Engineering

Soumyadeep De, Siddharth Singh, Pooja Aggarwal, Vishal Govind Rao

2402562 | First Published: 16 December 2024



Lead halide perovskite nanocrystals (NCs) show promise for photovoltaics, but efficient charge extraction is limited by unclear acceptor molecule interaction sites. This study identifies and maps these sites. The pivotal role of surface chemistry in dictating charge transfer dynamics within $CsPbBr_3$ (CPB) NCs through ligand engineering with 2,3-Dimercaptopropanol (DMP) is demonstrated.

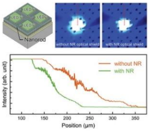
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

Optical Crosstalk Reduction via Nanorod Optical Shield for Light-Emitting Diode Displays

Hyeongtaek Lim, Hyerim Heo, Dong Yeong Kim, Jaehee Cho

2402574 | First Published: 20 December 2024



This study proposes a simple, cost-effective approach to mitigating optical crosstalk in LED displays by utilizing nanorod arrays fabricated from self-assembled Ni nanoparticles through solid-state dewetting. These nanorod arrays effectively redirect and absorb lateral light, shielding adjacent LED devices from light overflow and significantly reducing optical crosstalk.

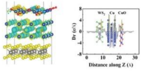
Abstract | **Full text** | **PDF** | **References** | **Request permissions**

Full Access

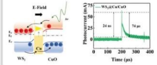
Cu-Plasma-Induced Interfacial Engineering for Nanosecond Scale WS_2/CuO Heterojunction Photodetectors

Tianze Kan, Kaixi Shi, Fujun Liu, Jinhua Li, Xuan Fang

2402572 | First Published: 20 December 2024



A WS_2@Cu/CuO heterojunction is designed with a gradient band arrangement, where the separation efficiency of the photogenerated carriers is enhanced by plasmon-induced charge transfer. As a result, WS_2@Cu/CuO PD achieves ultrafast response speed and high photoresponse.



Abstract | Full text | PDF | References | Request permissions

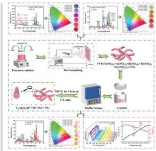
---

Full Access

Tunable Multicolor Luminescence, Full-Spectrum White-Light Emission and Optical Temperature Sensing Based on Bi^{3+}, Tb^{3+} and Eu^{3+} Doped $Y_4Al_2O_9$ Nanofibers

Xiaohan Liu, Hong Shao, Ning Li, Xue Teng, Dan Li, Xiangting Dong, Hongbo Zhang

2402585 | First Published: 21 November 2024



Bi^{3+} and Tb^{3+} are selected as luminescent centers and sensitizers with the help of energy level matching engineering of Bi^{3+} and Tb^{3+} having matching energy levels with Eu^{3+} to prepare $Y_4Al_2O_9$:Bi^{3+}/Tb^{3+}/Eu^{3+} nanofibers by electrospinning, and $Y_4Al_2O_9$:Bi^{3+}/Tb^{3+}/Eu^{3+} nanofibers achieve multicolor luminescence, full-spectrum white-light emission and excellent temperature sensing via double energy transfer effect, realizing dual functions of luminescence and temperature sensing.

Abstract | Full text | PDF | References | Request permissions

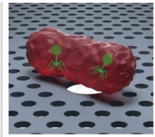
---

Open Access

Monitoring of Single-Cell Bacterial Lysis by Phages Within Integrated Optical Traps

Enrico Tartari, Nicolas Villa, Hugues de Villiers de la Noue, Simon Glicenstein, Emmanuel Picard, Pierre R. Marcoux, Marc Zelsmann, Emmanuel Hadji, Grégory Resch, Romuald Houdré

2402586 | First Published: 25 January 2025



The bacterial ecosystem is naturally regulated by viruses called bacteriophages. This study uncovers phage-bacteria interactions with homemade integrated resonant optical nanotweezers, whose electromagnetic field transduces the bacterial state at the single-cell level. These optical nano traps allow us to unveil bacterial viability, decipher the onset of bacterial bursts, and characterize the post-lytic state of dead bacteria.

Abstract | Full text | PDF | References | Request permissions

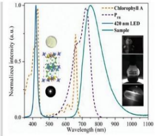
---

Full Access

Efficient Near-Infrared Luminescence in Cr^{3+} Activated *β*-Alumina Structure Phosphor via Multiple-Sites Occupancy

Kai Li, Dandan Wang, Dan Wu, Xiaoling Dong, Yue Wang, Yifan Liu, Guojun Zheng, Wenping Zhou, Liangliang Zhang

2402587 | First Published: 29 November 2024



Multiple crystallographic sites engineering is exploited to achieve high-performance NIR phosphor. *β*-alumina structure $Ba_{0.2}La_{0.55}Mg_{0.55}Al_{2.45}Ga_8O_{17.25}$:$0.10Cr^{3+}$ exhibits an efficient NIR emission peaking at 746 nm with a high internal (external) quantum efficiency of 97% (42.6%) and superior thermal stability of 90% @150°C by controlling the local crystal environment of Cr^{3+}.

Abstract | Full text | PDF | References | Request permissions

Copyright © 1999-2025 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.