

SPECIAL ISSUE

ACTIVE NANOPHOTONICS

Edited by A. Alù, H. V. Demir, and C. Jagadish

628 Active Nanophotonics

By A. Krasnok and A. Alù

| INVITED PAPER | This article reviews recent efforts in enabling active nanophotonic devices for lasing and optical sources, loss compensation, and to realize new optical functionalities at the nanoscale.

655 Two-Dimensional CdSe-Based Nanoplatelets: Their Heterostructures, Doping, Photophysical Properties, and Applications

By M. Sharma, S. Delikanli, and H. V. Demir

| INVITED PAPER | This article reviews the use of quasi-2-D CdSe-based colloidal quantum wells (nanoplatelets), covering their heterostructures, doping opportunities, and extraordinary photophysical properties, and extending the review to their applications in light-emitting diodes, lasers, and luminescent solar concentrators.

676 Optical Properties and Light-Emission Device Applications of 2-D Layered Semiconductors

By Y. Li, H. Sun, L. Gan, J. Zhang, J. Feng, D. Zhang, and C.-Z. Ning

| INVITED PAPER | This article reviews the use of 2-D layered semiconductors for light emission, optical gain, lasing, and enhanced resonances for nanophotonic applications.

704 Colloidal Plasmonics for Active Nanophotonics

By S. V. Gaponenko and D. V. Guzатов

| INVITED PAPER | This article reviews the use of plasmonic materials to confine light at the nanoscale and enable sensors and light-emitting and photovoltaic devices.

721 Integrated, Portable, Tunable, and Coherent Terahertz Sources and Sensitive Detectors Based on Layered Superconductors

By K. Delfanazari, R. A. Klemm, H. J. Joyce, D. A. Ritchie, and K. Kadowaki

| INVITED PAPER | This article reviews the use of stacks of intrinsic Josephson junctions as terahertz sources, with applications for spectroscopy, imaging, and tomography.

735 Physical Limits of NanoLEDs and Nanolasers for Optical Communications

By B. Romeira and A. Fiore

| INVITED PAPER | This article reviews nanoscale light sources for low-energy, high-density optical communication and sensing systems, comparing nano-light-emitting diodes and nanolasers, and examining their limits in performance as their size scales down.

DEPARTMENTS

615 POINT OF VIEW

DC Is the Future
N. Ertugrul and D. Abbott

625 SCANNING THE ISSUE

Active Nanophotonics
By A. Alù, H. V. Demir, and C. Jagadish

850 FUTURE SPECIAL ISSUE/SPECIAL SECTIONS



On the Cover:
Our cover image this month is an artist's rendition of a light radiating nucleus of an atom, which perfectly captures the topic of this special issue.

[Continued on page 614 ►]

SPECIAL ISSUE: Active Nanophotonics

749 Active and Tunable Nanophotonics With Dielectric Nanoantennas

By R. Paniagua-Domínguez, S. T. Ha, and A. I. Kuznetsov

| INVITED PAPER | This article reviews dielectric nanoantenna arrays to realize tunable and reconfigurable light manipulation, emission, and lasing.

772 Structured Semiconductor Interfaces: Active Functionality on Light Manipulation

By Y.-W. Huang, H.-X. Xu, S. Sun, Y. Wu, Z. Wang, S. Xiao, W. X. Jiang, T. J. Cui, D. P. Tsai, and C.-W. Qiu

| INVITED PAPER | This article presents tunable and reconfigurable metasurfaces based on semiconductor nanoparticles, discussing their potential impact in interface-based nanophotonics.

795 Lattice Resonances in Optical Metasurfaces With Gain and Loss

By R. Kolkowski and A. F. Koenderink

| INVITED PAPER | This article reviews the optical response of arrays of active scatterers to realize light-emitting metasurfaces with tailored emission properties and light-shaping functionalities.

819 Experimental Investigation of Lasing Modes in Double-Lattice Photonic-Crystal Resonators and Introduction of In-Plane Heterostructures

By M. Yoshida, M. Kawasaki, M. De Zoysa, K. Ishizaki, T. Inoue, Y. Tanaka, R. Hatsuda, and S. Noda

| INVITED PAPER | This article reports on light-emitting arrays of nanostructures to implement photonic-crystal surface-emitting lasers supporting large-area coherent lasing.

827 Electrically Pumped Microring Parity-Time-Symmetric Lasers

By W. E. Hayenga, H. Garcia-Gracia, E. Sanchez Cristobal, M. Parto, H. Hodaei, P. LiKamWa, D. N. Christodoulides, and M. Khajavikhan

| INVITED PAPER | This article presents the design and implementation of nanoscale electrically pumped lasers based on microring resonators obeying parity-time symmetry, offering ideal properties for active nanophotonic applications.

837 Topological Nanophotonics: Toward Robust Quantum Circuits

By A. Blanco-Redondo

| INVITED PAPER | This article reviews the field of topological photonics and its relevance for quantum photonic networks and systems.

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