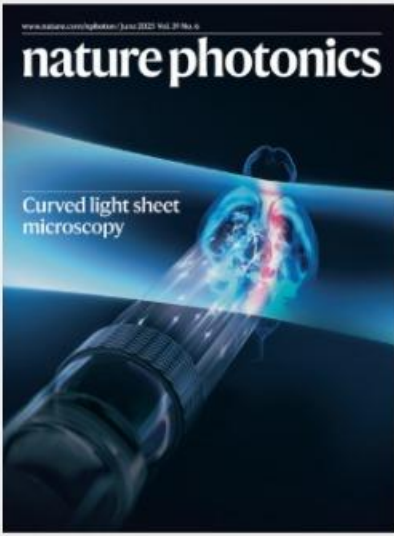


Volume 19 Issue 6, June 2025

← Previous issue | Volume 19



**Curved light sheet microscopy**

An artistic impression of curved light sheet microscopy of a mouse brain. The approach uses a curved light sheet as a source of illumination and a custom-designed objective lens to obtain image slices of cleared biological tissue that do not suffer from field curvature and provide diffraction-limited resolution over a wide field of view of 1 x 1cm<sup>2</sup>. The technique is applied to various mouse organs, enabling neuronal and vascular networks to be visualized.

See [Wu et al.](#)

Image: Jianglai Wu and Lijuan Tang, Chinese Institute for Brain Research, Beijing. Cover design: Bethany Vukomanovic

Subscribe

**Table of Contents**

[News & Views](#)

[Meeting Reports](#)

[Articles](#)

News & Views

News & Views  
05 Jun 2025

Splitting light pulses

Combining spatial and temporal modulation in aluminium zinc oxide metamaterials allows the fission of beams with distinct angles and frequencies, paving the way for advanced optical devices and applications like ultrafast beam steering and integrated neural networks.

Riccardo Sapienza

Advertisement

News & Views  
05 Jun 2025

Controlling magnetization dynamics in a single step

A new method that uses light-induced superconducting quenches to generate abrupt, sub-picosecond, local magnetic field steps has potential applications ranging from spintronics to spectroscopy of quantum materials.

Edoardo Baldini

News & Views  
05 Jun 2025

OLETs with narrowband emission

Giampaolo Pitruzzello

[Top of page](#)

Meeting Reports

Meeting Report  
05 Jun 2025

Pulsed lasers light up opportunities

Key advances included subcycle laser development, quantum vortex visualization, and terahertz-based analysis of solar cells — showcasing the benefit of pulsed lasers across a wide range of disciplines.

Noriaki Horiuchi

[Top of page](#)

Articles

Article

Open Access  
07 Mar 2025

Spatio-spectral optical fission in time-varying subwavelength layers

Nonlinear optical properties of transparent conducting oxides are explored through the full spatio-spectral fission of an ultrafast 93-fs pulse traversing a submicrometre time-varying aluminium zinc oxide layer in its near-zero-index region, providing insights into the use of these materials for integrated photonics, photonic time crystals and integrated neural networks.

Wallace Jaffray, Sven Stengel ... Marcello Ferrara

Article

Open Access  
03 Mar 2025

Fast, three-dimensional, live-cell super-resolution imaging with multiplane structured illumination microscopy

Three-dimensional multiplane structured illumination microscopy, combining three-beam interference, multiplane detection and a synergistically evolved reconstruction algorithm, enables 3D imaging at rates of up to 11 volumes per second in live cells with lateral and axial spatial resolutions of 120 and 300 nm, respectively.

Qian Chen, Wen Gou ... Xiaoshuai Huang

Article

11 Apr 2025

Curved light sheet microscopy for centimetre-scale cleared tissue imaging

Light sheet microscopy with curved light sheets enables tiling-free imaging of an entire intact cleared mouse brain with lateral and axial spatial resolutions of 1.0 µm and 2.5 µm, respectively, in less than 3 h.

Lijuan Tang, Jiayu Wang ... Jianglai Wu

Article

20 May 2025

Cross-polarized stimulated Brillouin scattering-empowered photonics

Cross-polarized stimulated Brillouin scattering and its integration with quadratic nonlinearity is studied in lithium niobate, which enhanced photonic device performance in a reconfigurable stimulated Brillouin laser with 0.7-Hz narrow linewidth and 40-nm tunability, an efficient coherent mode converter, and Brillouin-quadratic laser and frequency comb operational in near-infrared and visible bands.

Mingming Nie, Jonathan Musgrave & Shu-Wei Huang

Article

28 May 2025

Model-free estimation of the Cramér–Rao bound for deep learning microscopy in complex media

A convolutional network that approaches the fundamental Cramér–Rao bound is demonstrated to localize a reflective target hidden behind a dynamically fluctuating scattering medium, advancing algorithmic developments in the field of computational imaging.

Ilya Starshynov, Maximilian Weimar ... Dorian Bouchet

Article

Open Access  
02 Apr 2025

Generation of ultrafast magnetic steps for coherent control

Ultrafast magnetic field steps are generated by light-induced quenching of supercurrents in a YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> superconductor. They exhibit millitesla amplitude, picosecond rise times and slew rates approaching 1 GT s<sup>−1</sup>.

G. De Vecchi, G. Jotzu ... A. Cavalleri

Article

23 May 2025

Stable, deep blue tandem phosphorescent organic light-emitting diode enabled by the double-sided polariton-enhanced Purcell effect

Exploiting the polariton-enhanced Purcell effect in tandem organic light-emitting diodes enables deep-blue-emitting devices with an external quantum efficiency of 36.8% and an LT90 lifetime of 830 h at an initial luminance of 500 cd m<sup>−2</sup>. These metrics are increased to 56% and 1,800 h with substrate light outcoupling.

Haonan Zhao, Claire E. Arneson & Stephen R. Forrest

Article

Open Access  
16 May 2025

Angular dispersion suppression in deeply subwavelength phonon polariton bound states in the continuum metasurfaces

Phonon polariton quasi-bound states in the continuum realized in a dielectric metasurface patterned with a subwavelength lattice of elliptical holes in a commercially available free-standing, large-area 100-nm-thick silicon carbide membrane is demonstrated, attractive for applications in mid-infrared optics, such as molecular sensing and thermal radiation engineering.

Lin Nan, Andrea Mancini ... Stefan A. Maier

Article

Open Access  
23 May 2025

Dispersive-wave-agile optical frequency division

Using two-point optical frequency division based on a frequency-agile single-mode dispersive wave, a microwave signal source with record-low phase noise using a microcomb is demonstrated, offering over tenfold lower phase noise than state-of-the-art approaches.

Qing-Xin Ji, Wei Zhang ... Kerry Vahala

Article

23 May 2025

Microresonator-referenced soliton microcombs with zeptosecond-level timing noise

A compact optical frequency division system with magnesium-fluoride-microresonator-based frequency references and silicon-nitride-microresonator-based comb generators is reported, offering a soliton pulse train at 25-GHz microwaves with an absolute phase noise of −141 dBc Hz<sup>−1</sup> and timing noise below 546 zs Hz<sup>−1/2</sup> at a 10-kHz offset frequency.

Xing Jin, Zhenyu Xie ... Qi-Fan Yang

Article

23 May 2025

Microcavity Kerr optical frequency division with integrated SiN photonics

By leveraging microcavity-integrated photonics and Kerr-induced optical frequency division, an integrated photonic millimetre-wave oscillator with low phase noise is demonstrated, achieving −77 dBc Hz<sup>−1</sup> and −121 dBc Hz<sup>−1</sup>, respectively, at 100-Hz and 10-kHz offset frequencies, corresponding to −98 dBc Hz<sup>−1</sup> and −142 dBc Hz<sup>−1</sup> when scaled to a 10-GHz carrier.

Shuman Sun, Mark W. Harrington ... Xu Yi

Article

Open Access  
28 Apr 2025

Ultracompact multibound-state-assisted flat-band lasers

A laser design that exploits multiple bound states on a flat band to tightly confine light in three dimensions yields an ultracompact terahertz quantum cascade laser cavity with a lateral size of ~3λ.

Jieyuan Cui, Song Han ... Qi Jie Wang

Article

13 May 2025

Ultrahigh-radiance near-infrared organic light-emitting diodes

An acceptor–donor–acceptor organic semiconductor enables near-infrared organic light-emitting diodes with reduced efficiency roll-off over six orders of magnitude of excitation current density, enabling a maximum luminance of 2,000 W sr<sup>−1</sup> m<sup>−2</sup>.

Wansheng Liu, Wanyuan Deng ... Yong Cao

[Top of page](#)

Nature Photonics (*Nat. Photon.*) | ISSN 1749-4893 (online) | ISSN 1749-4885 (print)

About Nature Portfolio

[About us](#)  
[Press releases](#)  
[Press office](#)  
[Contact us](#)

Discover content

[Journals A-Z](#)  
[Articles by subject](#)  
[protocols.io](#)  
[Nature Index](#)

Publishing policies

[Nature portfolio policies](#)  
[Open access](#)

Author & Researcher services

[Reprints & permissions](#)  
[Research data](#)  
[Language editing](#)  
[Scientific editing](#)  
[Nature Masterclasses](#)  
[Research Solutions](#)

Libraries & institutions

[Librarian service & tools](#)  
[Librarian portal](#)  
[Open research](#)  
[Recommend to library](#)

Advertising & partnerships

[Advertising](#)  
[Partnerships & Services](#)  
[Media kits](#)  
[Branded content](#)

Professional development

[Nature Careers](#)  
[Nature Conferences](#)

Regional websites

[Nature Africa](#)  
[Nature China](#)  
[Nature India](#)  
[Nature Italy](#)  
[Nature Japan](#)  
[Nature Middle East](#)