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nature photonics Curved light sheet	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 ² . The technique is applied to various mouse organs, enabling neuronal and vascular networks to be visualized.	Table of Contents News & Views Meeting Reports Articles				
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Noriaki Horiuchi

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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 Ferrera
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	Model-free estimation of the Cramér-Rao bound for deep learning microscopy in complex media				
28 May 2025	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	Generation of ultrafast magnetic steps for coherent control				
Open Access 02 Apr 2025	Ultrafast magnetic field steps are generated by light-induced quenching of supercurrents in a YBa ₂ Cu ₃ O ₇ superconductor. They exhibit millitesla amplitude, picosecond rise times and slew rates approaching 1 GT s ⁻¹ .				
	G. De Vecchi, G. Jotzu A. Cavalleri				
Article 23 May 2025	<u>Stable, deep blue tandem phosphorescent organic light-emitting diode enabled by the double-sided</u> 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 ⁻² . These metrics are increased to 56% and 1,800 h with substrate light outcoupling.				
	Haonan Zhao, Claire E. Arneson & Stephen R. Forrest				
Article	Angular dispersion suppression in deeply subwavelength phonon polariton bound states in the continuum				
Open Access 16 May 2025	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	Dispersive-wave-agile optical frequency division				
Open Access 23 May 2025	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	Microresonator-referenced soliton microcombs with zeptosecond-level timing noise				
23 May 2025	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 ⁻¹ and timing noise below 546 zs Hz ^{-1/2} at a 10-kHz offset frequency.				
	Xing Jin, Zhenyu Xie Qi-Fan Yang				
Article	Microcavity Kerr optical frequency division with integrated SiN photonics				
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	Jieyuan Cui, Song Han Qi Jie Wang				
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	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 ⁻¹ m ⁻² .				
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