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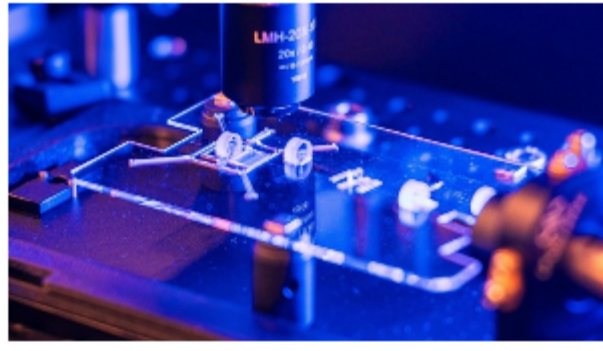
OPTICS NEWSLETTER

The latest news, features, and product developments in optics and optical fabrication – brought to you by Photonics Media. Manage your Photonics Media membership at [Photonics.com/subscribe](https://www.photonics.com/subscribe).

Femtosecond Laser Integrates Optics in Single Glass Substrate for Easy Manufacture

The short, regular pulses of femtosecond lasers are put to effective use in numerous applications, including laser surgery, micromachining, microscopy, and spectroscopy. Free-space optics offers substantial freedom in femtosecond laser design — but this comes at the cost of limited miniaturization and manufacturability. A new approach, developed at École Polytechnique Fédérale de Lausanne (EPFL), makes the free-space optical components of a femtosecond laser easier to align, thus making the laser easier to manufacture.

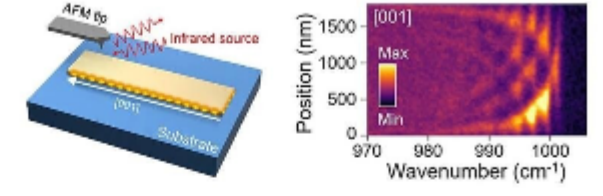
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Synthesized Nanoresonators Harness Power of IR for Optics and Electronics

To make high-quality crystals that resonate strongly with IR light, researchers at Stanford University and Lawrence Berkeley National Laboratory (LBNL) developed a bottom-up, self-assembly approach to synthesize nanostructures with crystal qualities consistent with bulk single crystals. The ultrathin nanostructures act as ultrahigh-quality, nanoscale resonators of lattice vibrations at IR frequencies, to provide a high-performance, low-loss platform for IR applications.

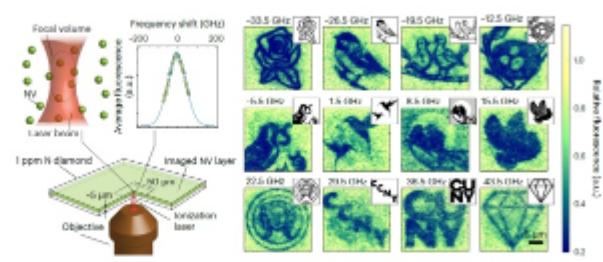
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Optical Data Storage Dips Below the Diffraction Limit

Physicists at The City College of New York have developed a technique with the potential to enhance optical data storage capacity in diamonds. This is possible by multiplexing the storage in the spectral domain.

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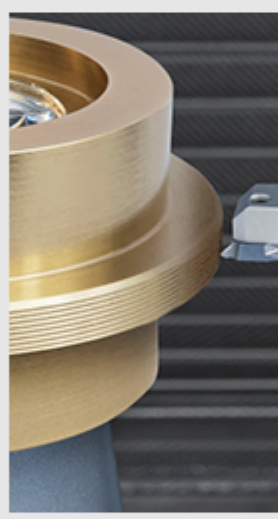
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.:More News

Low-Power Optical Tweezers Shield Trapped Bioparticles from Damage

Researchers at the University of Texas at Austin (UT) developed a way to overcome the intense laser heating that causes optical tweezers to scorch biological objects. The approach, called hypothermal opto-thermophoretic tweezers (HOTTs), achieves low-power — and noninvasive — trapping of diverse biological cells and colloids in their native fluids. The tweezers combine environmental cooling and localized laser heating to realize low-power, thermophoretic trapping of target objects, while simultaneously avoiding optical and thermal damage.

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Virtual Superlens Exceeds Diffraction Limit Without Image Distortion

The diffraction limit enforces physical restrictions on how closely an object can be examined using traditional optical methods. Previous attempts to develop superlenses that image beyond the diffraction limit have met with extreme visual losses, to the point of making the lenses opaque. A virtual superlensing approach developed by researchers at the University of Sydney has broken through the diffraction limit by a factor of nearly four times. The researchers' innovative approach to superlensing could improve superresolution microscopy for fields as varied as medical imaging, archaeology, and forensics.

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Birefringent All-Glass Metasurface Could Transform Waveplate Tech

Lawrence Livermore National Laboratory researchers have adapted their novel metasurface process, which creates a thin layer on the surface of an optic, to create an all-glass metasurface with birefringence, or dual refraction, properties. This achievement could transform waveplate technology for high-power laser systems such as the National Ignition Facility.

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Barrier to Optical Wireless Broken with Photonic Chip

Researchers from Politecnico di Milano, Scuola Superiore Sant'Anna, the University of Glasgow, and Stanford University have created photonic chips that mathematically calculate the optimal shape of light to best pass through any environment, even one that is unknown or changing over time.

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.: Upcoming Webinars



Laser Application for Display Manufacturing

Tue, Jan 16, 2024 10:00 AM - 11:00 AM EST

Displays are windows into the connected world as nearly every consumer device today has a display and a smartphone without one is impossible to imagine. To produce state-of-the-art displays lasers must be utilized, especially to create high-end and high-resolution designs. Dr. Oliver Haupt from Coherent focuses on OLED displays for smart phones as well as the adoption of OLED displays in the IT sector. He also addresses the incremental market opportunity for MicroLED displays from the very small range in AR to the very large 4K TV market. Finally, he explains how over the last few years more and more UV short wavelengths lasers have been required and implemented in production due to the display material combinations, increase of active display areas, and pixel sizes down to the micron level. Sponsored by LightMachinery Inc.

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