

# This Week in PHOTONICS

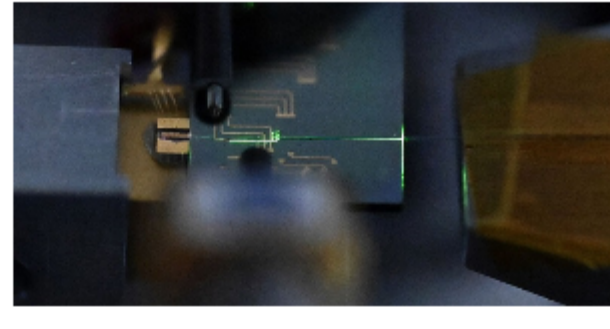


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## :: Top Stories

### Mode-Locked Laser Made to the Size of an Optical Chip

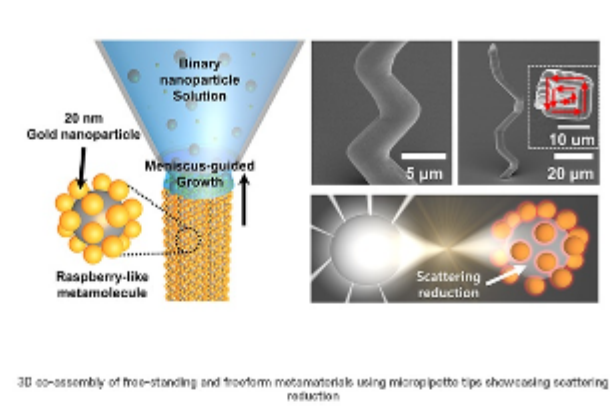
Researchers from the City University of New York (CUNY) Graduate Center and the California Institute of Technology (CalTech) have shrunk a mode-locked laser (MLL) to the size of an optical chip with an integrated nanophotonic platform. The results show promise for developing ultrafast nanophotonic systems for a wide range of applications.



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### 3D Printing and Co-Assembly Smooth Path to Broader Use of Metamaterials

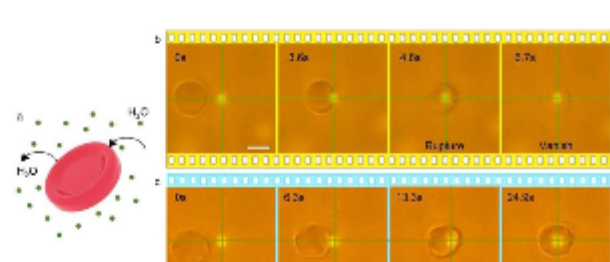
Researchers at the Pohang University of Science and Technology developed a method for 3D co-assembly of freestanding and freeform metamaterials using micropipette tips showcasing scattering reduction. The method surpasses limitations of existing metamaterial fabrication processes by enabling design and implementation of freeform nanophotons.



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### Low-Power Optical Tweezers Shield Trapped Bioparticles from Damage

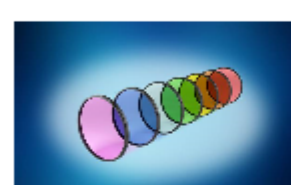
Researchers at the University of Texas at Austin (UT) developed a way to overcome the intense laser heating that causes optical tweezers to scorch biological objects. The approach, called hypothalamic opto-thermophoretic tweezers (HOTTs), achieves low-power — and noninvasive — trapping of diverse biological 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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## :: Featured Products & Services



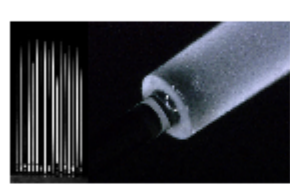
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## :: Upcoming Webinars

### The Etendue Mystery Revealed

Tue, Nov 28, 2023 10:00 AM - 11:00 AM EST

Etendue is the most important and fundamental quantity in illumination optics while simultaneously the most mysterious, misunderstood, and misused quantity. This is because, under certain conditions, etendue follows a conservation law. Similar to all conservation laws, understanding etendue provides great insight into what can be achieved with illumination optics. The confusion instead comes from understanding under what conditions etendue follows this conservation law. In this presentation, Julius Muschaweck explains what etendue is, exactly when etendue is conserved, as well as how etendue can help to assess feasibility and guide the optical designer toward finding effective optical solutions.

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### Design and Optimization of Optical Waveguides

Thu, Nov 30, 2023 2:00 PM - 3:00 PM EST

Optical waveguides are important building blocks for many optical devices and systems. Well-known applications range from basic optical fibers to more complex multiphysical components, such as integrated optical modulators and semiconductor optoelectronic devices for telecommunication. Moreover, waveguide devices are widely used for optical sensing and high-quality fiber laser light sources. This webinar shares about modeling optical waveguides using the Wave Optics Module, an add-on to COMSOL Multiphysics®. It covers topics such as the construction of complex waveguide structures using basic waveguide parts, the analysis of mode fields and propagation constants, and the modeling of wave propagation along optical waveguides. A representative from COMSOL introduces multiphysics couplings and shows optimization strategies while also sharing how to build and maintain custom simulation apps based on specific models, for use by colleagues or customers. Presented by COMSOL.

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## :: All Things Photonics

**Peter O'Brien**, director of the PIXAPP Photonics Packaging Pilot Line and head of the photonics packaging group at the Tyndall Institute, overviews the current state of integrated photonics technologies, as well as core considerations in the sector. Focus is given to packaging, heterogeneous integration, and dynamic collaboration. **David McGovern**, senior business development manager with the Irish Photonics Integration Centre (IPIC [Science Foundation Ireland Research Centre for Photonics]) and deputy chairperson of Medphab, joins the conversation to discuss the bridge between commercial and industry needs and high-level R&D.

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