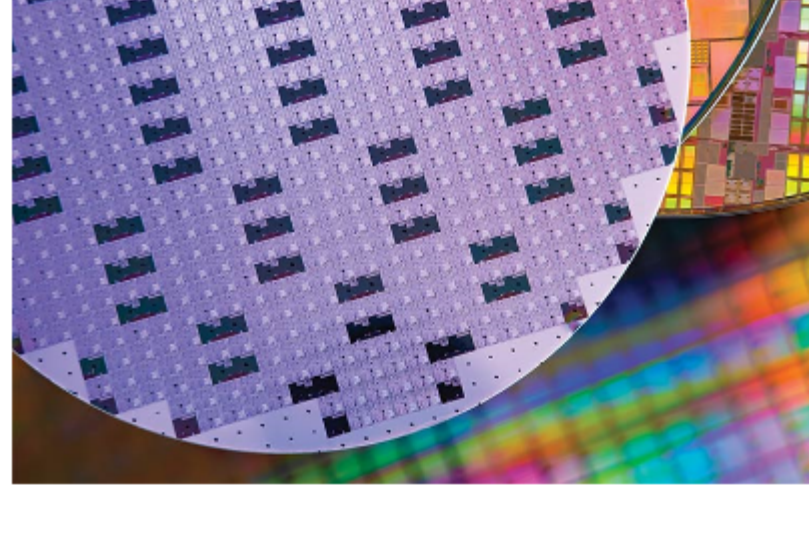




Monthly Newsletter

Monthly newsletter from the editors of Photonics Spectra, with features, popular topics, new products, and what's coming in the next issue. [Photonics.com/subscribe](https://www.photonics.com/subscribe).



Innovative Optical Lithography Advances High-Resolution Semiconductor Laser Production

The rapid advancement of AI, driven by large-language models, is creating unprecedented demand for computational power. This surge has in turn placed tremendous pressure on the underlying physical hardware, such as optical communication modules in data centers. Within these modules, semiconductor lasers such as distributed feedback

lasers and VCSELs are fundamental components. The durability and performance advantages of these lasers extend beyond data communications into a wide range of applications. [Read Article](#)

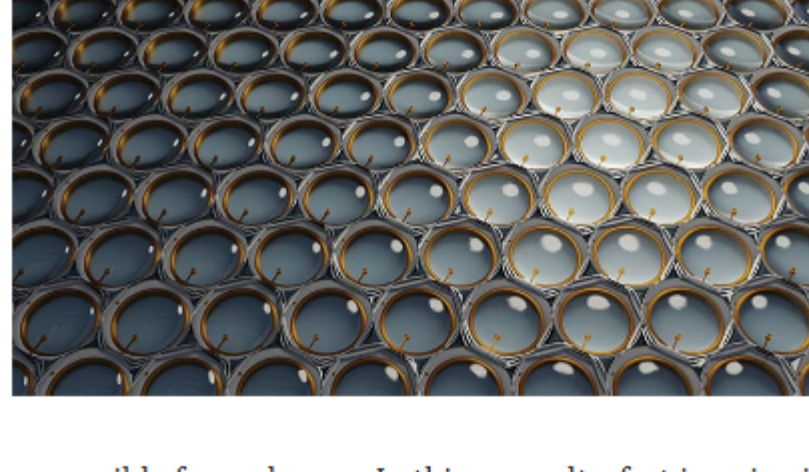


Image Sensor Design Innovation Shines When the Lights Go Down

Speed is of the utmost importance for many imaging and machine vision tasks. This metric is often used in the context of image capture rates and acquisition times. For a range of applications, including industrial inspection and production-line quality assurance, high-speed imaging is paramount to ensure that captured images yield as much usable information

as possible for end users. In this way, ultrafast imaging is an essential tool for informed decision-making. [Read Article](#)



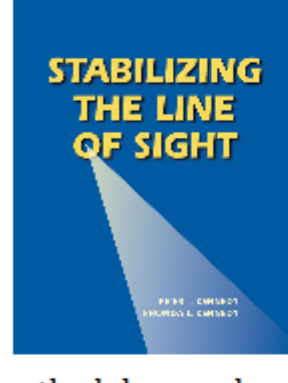
Polymer Optics Reveal That Discounting Aspheres Comes at a Cost

For centuries, the sphere has been the most widely used optical surface. This is due largely to the fact that traditional grinding and polishing techniques leverage the property that spheres fit together regardless of orientation. The properties of a sphere enable simpler and more cost-effective mass production. But other characteristics also contribute to the sphere's popularity in optical design and manufacturing.

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Featured Products & Services



Stabilizing the Line of Sight

Photonics Media

In *Stabilizing the Line of Sight*, authors Peter J. and Rhonda L. Kennedy provide a methodology and an example for executing a successful end-to-end line-of-sight (LOS) design. Comprehensive in scope, this book will give readers a better understanding of the relationships between the various engineering disciplines that are required for successful LOS control.

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Spectrogon manufactures infrared filters and windows with high transmission, high rejection outside the passband, while maintaining excellent coating uniformity for thermal imaging and gas detection applications such as cryogenically cooled IR detectors and uncooled microbolometers. Our filters and windows range in dimension from Ø6.0 to Ø200.0 mm, with dicing capabilities down to as small as 1.0 × 1.0 mm.

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In Case You Missed It

Lipson Team Develops Microcomb Source On-Chip for Data Centers

Researchers from the Columbia University School of Engineering and Applied Sciences have developed a method to create a high-power frequency comb that avoids the need for large and expensive lasers and amplifiers. The team's discovery enabled the researchers to bring the power of the frequency comb on-chip, yielding a compact, high-power, multiwavelength light source. [Read Article](#)

USC Team Holds Key to Universal Routing of Light

In nonlinear, multimode optical environments, light is typically too chaotic to be routed in a predictive way. Researchers at the University of Southern California developed a way for light to self-direct itself along designated paths by applying the principles of thermodynamics. [Read Article](#)

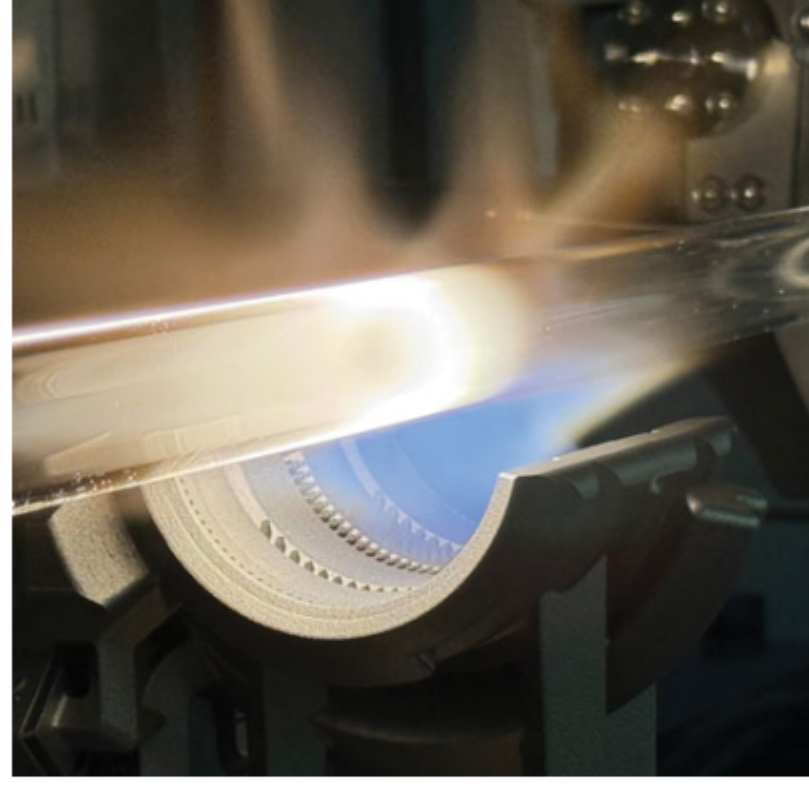
Light-Powered Gears Drive Chip-Size Motors

Downsizing the gears and micromotors used in devices could help reduce their footprints. But efforts to do so have been hampered by the challenges of constructing drive trains for the gears at scales smaller than 0.1 mm. Miniaturized gears could be used to develop mechanized tools for exploring microscopic phenomena like friction and surface interactions. [Read Article](#)

Caltech Research Enables Coherent Spectral Broadening On-Chip

Broadband, coherent light sources are highly valued in R&D. But until now, they have been difficult to achieve without bulky, inefficient tabletop devices. A Caltech team led by professor Alireza Marandi developed an efficient solution to integrating a broad spectrum of frequencies on a microchip. [Read Article](#)

Latest Webinars



Manufacturing Solutions for Hollow-Core Fibers

Tue, Dec 16, 2025 10:00 AM - 11:00 AM EST

This webinar explores the complete hollow-core fiber manufacturing chain and the Nextrom machinery that enables it. Beginning with preform manufacturing systems, it examines equipment designed to produce high-quality structures for hollow-core geometries. The webinar will then focus on the fiber draw tower, where precise control of furnace temperature, capstan tension, and internal gas pressure is essential. Finally, it will cover how proof testing equipment ensures the mechanical strength and long-term reliability of the hollow-core fiber. Along the way, the webinar will show how Nextrom's advanced process control and automation features improve yield, reduce defects, and enable consistent fiber quality. Presented by Nextrom.

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Dynamic Beam Lasers for Free-Space Optical Propagation

Mon, Dec 22, 2025 11:00 AM - 12:00 PM EST

This webinar will explore how CBC and dynamic beam shaping are redefining high-power optical propagation. Attendees will learn how DBLs overcome turbulence, enhance beam stability, and enable precise, controllable optical transmission in real-world free-space environments. Dynamic beam lasers (DBLs), based on coherent beam combining (CBC), mark a new frontier in free-space optical propagation. Unlike traditional single-beam sources, DBLs can dynamically control beam shape, phase, and direction in real time. With power levels reaching up to 120-kW continuous wave, flexible beam steering, and adaptive beam shaping, DBLs deliver high-precision, high-reliability optical transmission across free-space environments.

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Features

Optical Gratings, Metrology in Semiconductor Manufacturing, Optical Design and Assembly

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