

# PHOTONICS spectra®

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## A New Alexandrite Laser Drives More Sustainable Atmospheric Science

As anyone who has ever worked with an alexandrite laser can attest, its lasing medium demands respect. "It has about every problem a laser engineer can imagine," said Josef Höffner, a scientist at the Leibniz Institute of Atmospheric Physics (IAP) in Kühlungsborn, a small town on the shores of the Baltic Sea in northern Germany. Although the use of alexandrite as a laser crystal has inherent challenges, alexandrite lasers are a promising tool for the lidar systems used in breakthrough atmospheric research.



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## sCMOS Camera Designs Push the Limits on Resolution

Applications ranging from astronomy to the life sciences to semiconductor manufacturing and metrology have steadily increased the demand for camera technologies targeting the extreme-ultraviolet (EUV) and even the soft x-ray regimes. Many of these potential implementations impose the usual considerations around minimizing camera size. But the comparatively high-energy photons that characterize the targeted spectral ranges further demand camera designs that deliver a higher degree of protection against potentially damaging radiation.



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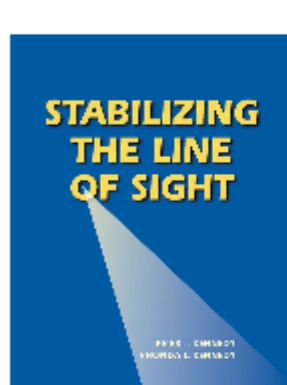
## Free-Space Optical Communications Soar with the Satellite Sector

Free-space optics (FSO) and systems are uniquely valuable in enabling fast and secure connectivity, both in terrestrial and nonterrestrial networks. With major advancements in space optics over the last 20 years, ultrahigh-bandwidth signals now regularly ping back and forth over great distances, providing a communications canopy that extends over the entire globe.



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## Featured Products & Services



### Stabilizing the Line of Sight

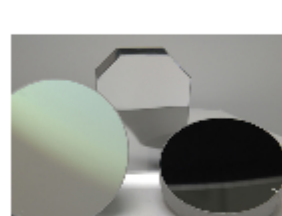
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In *Stabilizing the Line of Sight*, authors Peter J. and Rhonda L. Kennedy provide a methodology and an example for executing a successful end-to-end line-of-sight (LOS) design.

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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### Aspheric and Freeform Mirrors

Spectrum Scientific Inc. (SSI)

Using a state-of-the-art replication process, Spectrum Scientific offers a cost-effective solution for high-volume precision aspheric and freeform mirrors, without sacrificing quality or performance. Available on a wide range of substrates including glass, aluminum, and ceramics, our mirrors can often be replicated onto the mounting structure for easy alignment and cost savings.

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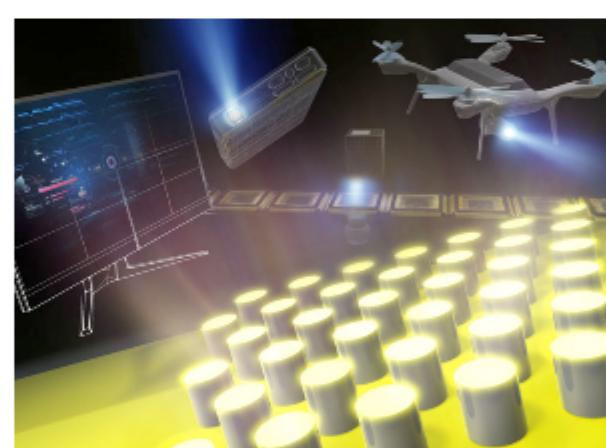
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## In Case You Missed It

### Materials Swap Improves Nanoantenna Performance, Efficiency

Light-scattering nano-elements, also known as nanoantennas due to their ability to harness light, are used as an optical control technology in nanophotonics. In combination with a phosphor plate, and upon irradiation, these 2D structures — in which nanoparticles are arranged periodically on a substrate — achieve a mix of blue and yellow light and enable spatial and spectral control over luminescence.



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### Pump-Probe Spectroscopy Helps Achieve Chiral Molecular Control

An international research team at Freie Universität Berlin, in collaboration with colleagues at the DESY research center, Kiel University, and Kansas State University, has proposed a quantum-chemical calculation-based approach to induce and probe chiral vibrational motion using pump-probe spectroscopy. Such an approach aims provide a solution to achieve absolute asymmetric synthesis, or the control of product chirality using only light fields.

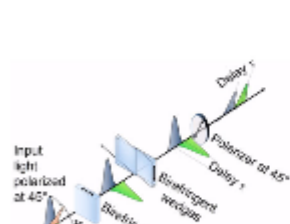
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### Photonic System Explores Two-Dimensional Topological Pumping

In photonic systems, Thouless pumping enables light transport to take place in a robust way. The method is quantized — determined by the global rather than the local properties of a system. It exhibits topological features, and its ubiquitous nature leads to its occurrence in many areas of science.

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## Upcoming Webinars



### Innovations in Interferometry: Fourier Transform Spectroscopy in the Palm of Your Hand

Wed, Feb 15, 2023 10:00 AM - 11:00 AM EST

Alex Barker of NIREOS shares how a common-path visible interferometer functions, as well as the counterintuitive ways in which it differs from a dispersion-based spectrometer. In a short time, these instruments have provided a startling variety of spectroscopic experiments, such as time-resolved fluorescence, pump-probe spectroscopy, and stimulated Raman scattering. Using these examples, Barker demonstrates the advantages and disadvantages that common-path visible interferometers provide.

[Register Now](#)

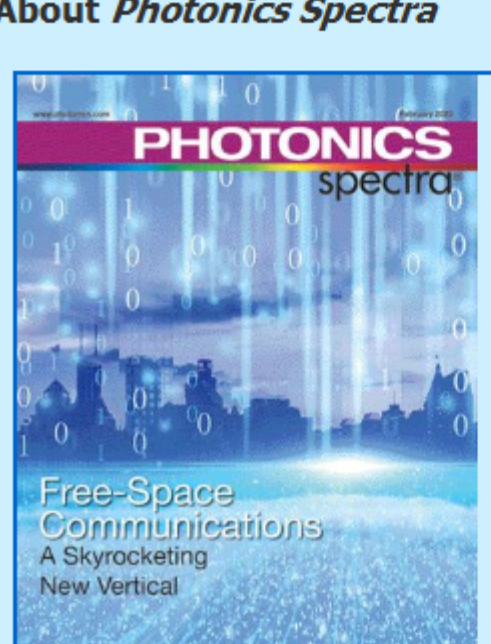
## Next Issue:

### Features

Supercontinuum Lasers, Metalenses, Gas Analysis, and more...

Photonics Media is currently seeking technical feature articles on a variety of topics for publication in our magazine *Photonics Spectra*. Please submit an informal 100-word abstract to Daniel McCarthy, Senior Editor, at [Daniel.McCarthy@Photonics.com](mailto:Daniel.McCarthy@Photonics.com), or use our online submission form [www.Photonics.com/submitfeature.aspx](https://www.Photonics.com/submitfeature.aspx).

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