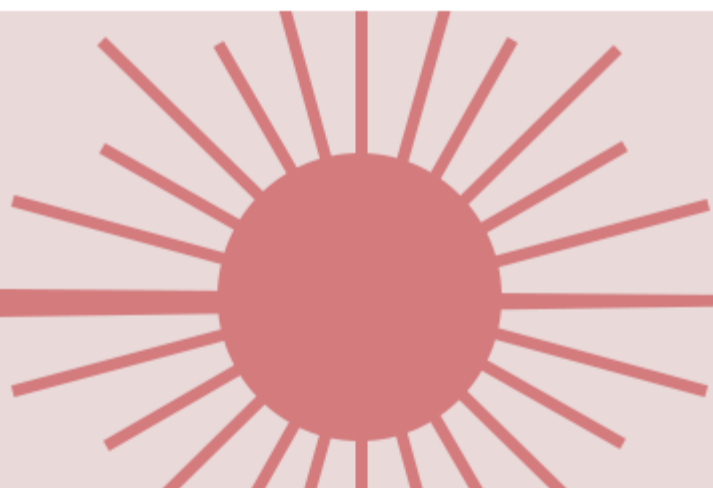


# LASERS



## Tech Pulse



April 2018

Lasers Tech Pulse is a special edition newsletter from Photonics Media and Bristol Instruments covering key developments in laser technology. Manage your Photonics Media membership at [Photonics.com/subscribe](http://Photonics.com/subscribe).

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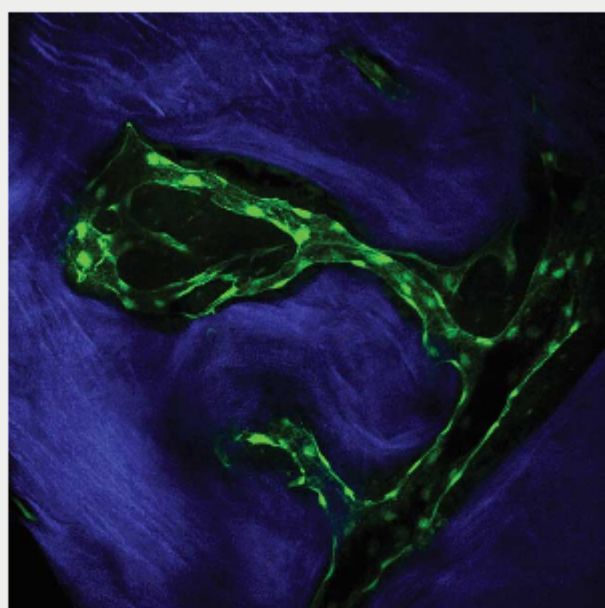


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### Multiphoton Microscopy Sets the Standard for Live-Cell Imaging

Multiphoton imaging is widely used for live-cell imaging. Many of the applications are in neuroscience, where the trends involve deeper imaging using longer wavelengths. These trends are the leading drivers behind the latest generation of ultrafast lasers based on ytterbium (Yb) fiber. However, there are numerous other applications far outside the field of neuroscience, and these are often served with traditional titanium:sapphire (Ti:S) ultrafast lasers.



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#### High-Speed Laser Wavelength Meter

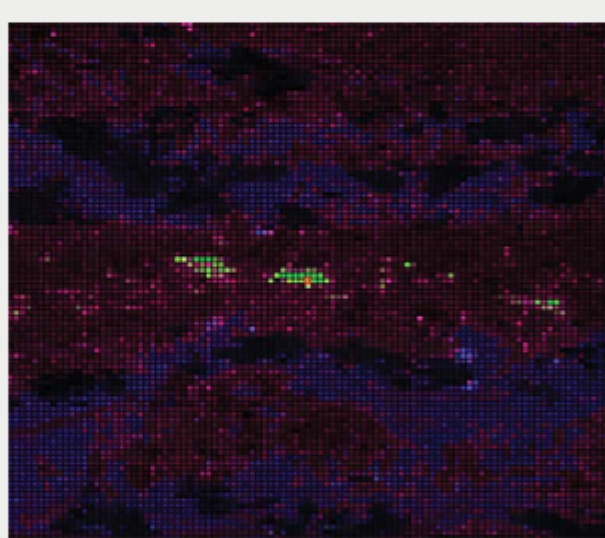
Bristol Instruments' 871 Laser Wavelength Meter measures laser wavelength at a sustained rate of 1 kHz, the fastest available. The resulting time resolution of 1 ms provides the most detailed analysis of tunable lasers. The system is automatically calibrated with a built-in wavelength standard to ensure accurate performance is maintained over time. This provides the reliable accuracy needed for the most meaningful experimental results.



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### Laser-Induced Breakdown Spectroscopy Beyond the Lab

Laser-induced breakdown spectroscopy (LIBS) techniques have been studied and applied for more than half a century. Only recently has LIBS moved from research circles to industry. Offering advantages over other analytical techniques, laser-induced breakdown spectroscopy is useful in mineral extraction, forensics and point-of-care blood analysis.



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### Diffractive Optical Elements: Minimizing Zero Order

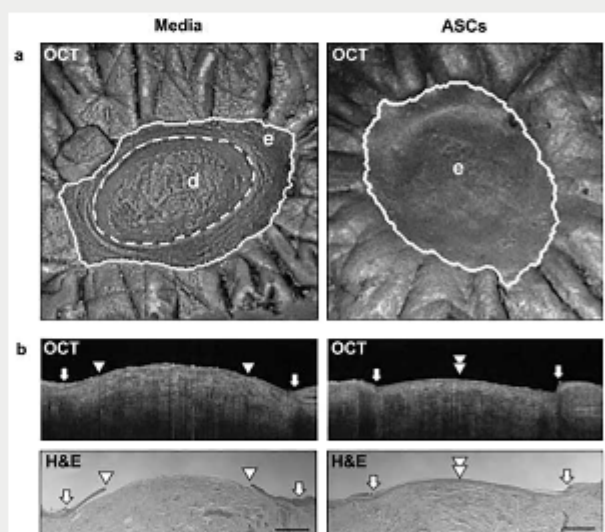
Diffractive optics have evolved into an effective way of beam shaping and splitting. They're lightweight and compact and can be integrated easily into optical systems. They also can perform several optical functions in a single element. Recent advances in diffractive optical elements have made them a standard component in laser material processing, medical and aesthetic lasers, and structured light projection systems.



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### Vying for Dominance: Swept-Source vs. Spectral-Domain OCT

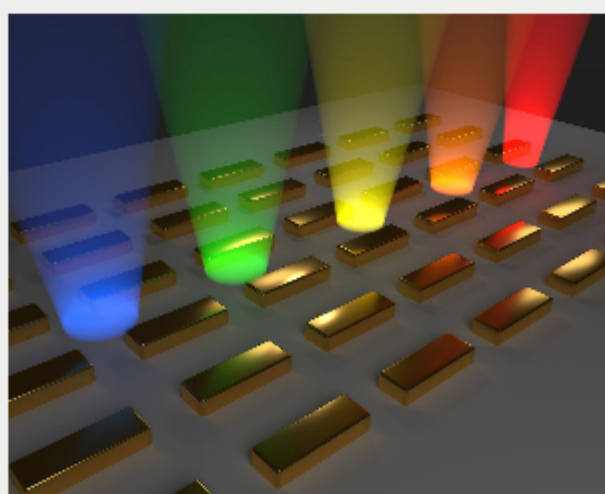
At its core, OCT is a low-coherence interferometric technique. The earlier versions used time-domain interferometry. However, the technique really came into its own when Fourier-domain versions of OCT were introduced. In this implementation, interference of different wavelengths or colors illuminating the sample are recorded separately, and a depth profile is obtained using Fourier transformation to convert the data from wavelength domain to image domain.



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### New Bose-Einstein Condensate Couples Light with Metal Electrons

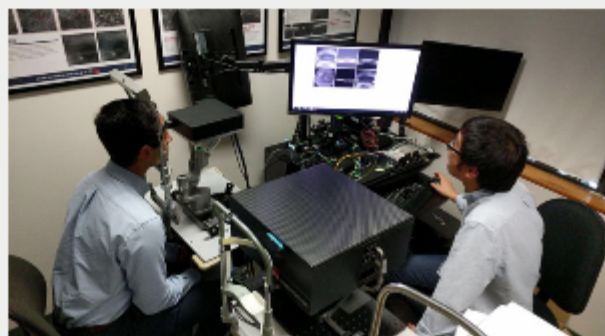
Researchers created a new Bose-Einstein condensate, where the condensed particles were mixtures of light and metal electrons (so-called surface plasmon polaritons), in motion in gold nanorods arranged into a periodic array. Unlike most previous Bose-Einstein condensates created experimentally, the new condensate does not need to be cooled down to temperatures near absolute zero.



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### Laser Scanner Could Help Diagnose Disease Before Vision Loss Occurs

A retinal imaging scanner has been developed that can produce high-resolution, 3D cross-sectional images of the retina, including individual photoreceptors and fine capillaries. The scanner is extremely compact (about the size of a shoebox), making it suitable for everyday use in medical clinics and hospitals.



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