

LASERS



Tech Pulse

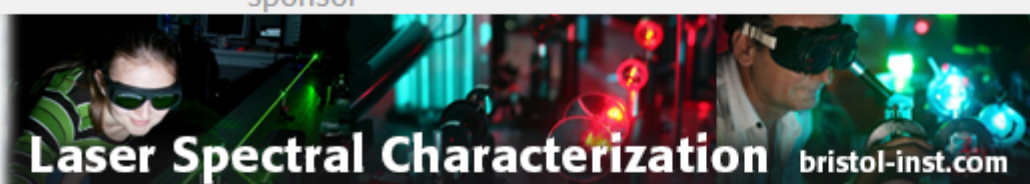


PHOTONICS MEDIA

April 2017

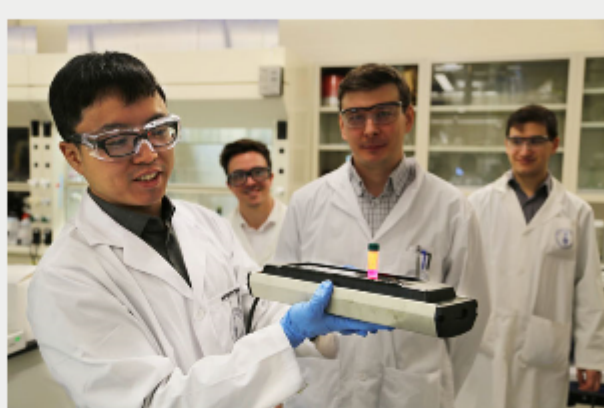
Lasers Tech Pulse is a special edition newsletter from Photonics Media and Bristol Instruments covering key developments in laser technology.

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Changing the Shape of CQDs Could Enable Continuous QD Lasing

A novel method for fabricating lasers uses saucer-shaped quantum dots (QDs) to produce continuous laser light that could be brighter, less expensive and more tunable than current devices. Although the ability to produce laser light using colloidal QDs (CQDs) was first demonstrated more than 15 years ago, commercial application has remained elusive because a very large amount of light is needed to excite the QDs, leading to heating loss and overheating.

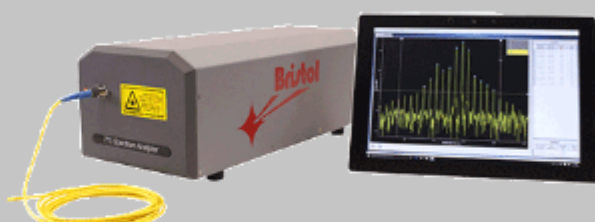


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PROMOTED CONTENT Bristol Instruments Inc.

771 Series Laser Spectrum Analyzer

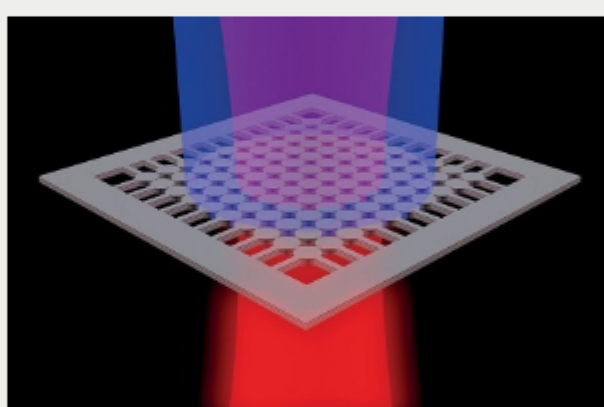
The 771 Laser Spectrum Analyzer combines proven Michelson interferometer technology with fast Fourier transform analysis to measure both a laser's wavelength and spectrum. Absolute wavelength is determined to an accuracy as high as ± 0.2 parts per million. And, with a spectral resolution as high as 2 GHz and an optical rejection ratio (ORR) of > 40 dB, the system provides the most detailed information about a laser's spectral properties.



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Novel BIC Laser Holds Promise for Optical Communications

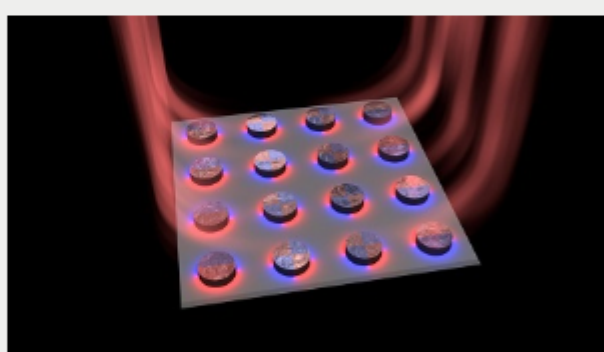
Researchers at the University of California San Diego have developed a laser based on an unconventional wave physics phenomenon known as bound states in the continuum — BIC. The new BIC lasers have the potential to be developed as high-power lasers for industrial and defense applications. The technology could also revolutionize the development of surface lasers for communications and computing applications.



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Plasmonic Nanolaser Opens the Way for Coherent On-Chip Light Sources

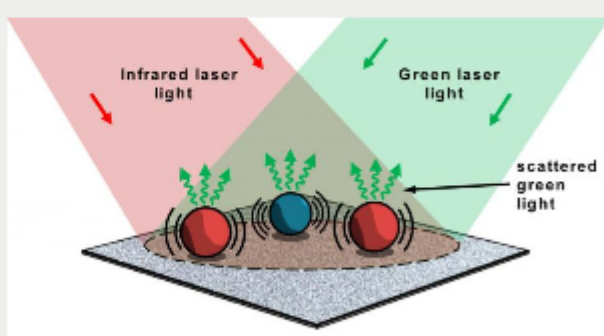
Using "dark lattice modes," researchers at Aalto University have created a plasmonic nanolaser that operates at visible light frequencies. The laser works at length scales 1000 times smaller than the thickness of a human hair. The results open new prospects for on-chip coherent light sources, such as lasers, that are extremely small and ultrafast.



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Spectroscopy Technique Could Detect Chemicals in Minuscule Amounts

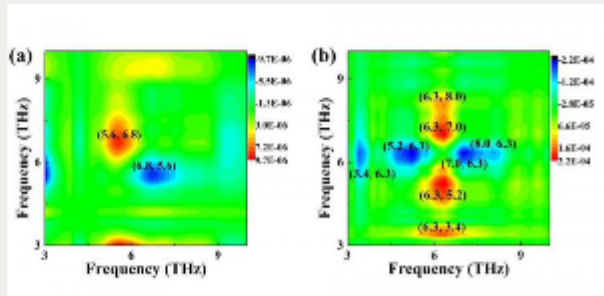
A microscope that can chemically identify μm -sized particles could one day be used in airports and other high-security venues to rapidly screen people for microscopic amounts of potentially dangerous materials. The technique, which was developed by researchers at the Massachusetts Institute of Technology's Lincoln Laboratory, uses photothermal modulation of Mie scattering (PMMS) to enable concurrent spatial and spectral discrimination of individual μm -sized particles, and uses an imaging configuration to detect multiple species of particles.



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Terahertz Analysis Helps Target Measures for Controlling Pollution

A combination of terahertz (THz) absorption and 2D correlation spectroscopy (2DCOS) has been used to identify the concentration and pollution sources of PM2.5 (particulate matter less than 2.5 μm in diameter) in the Beijing-Tianjing-Hebei region of China. The THz-2DCOS analysis revealed that samples with high PM2.5 were related to higher THz absorption at selected frequencies. This information was used to determine appropriate emergency measures needed to relieve haze pollution.



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Phototherapy Could Thwart Neuropathic Pain

Low-level laser therapy could provide a noninvasive and effective method for treating neuropathic pain caused by nerve damage, spinal cord injury or diseases such as diabetes. In studies performed at the Biomedical Science Institute (ICB-USP) in Brazil, laser therapy was tested in three models of neuropathic pain using rats. Behavioral responses improved in all three models. The results of the studies suggest that all three models shared a common response to the laser therapy which included myelin sheath regeneration and reduced astrocyte migration to the site of the inflammation.

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