

# SPECTROSCOPY

## Tech Pulse

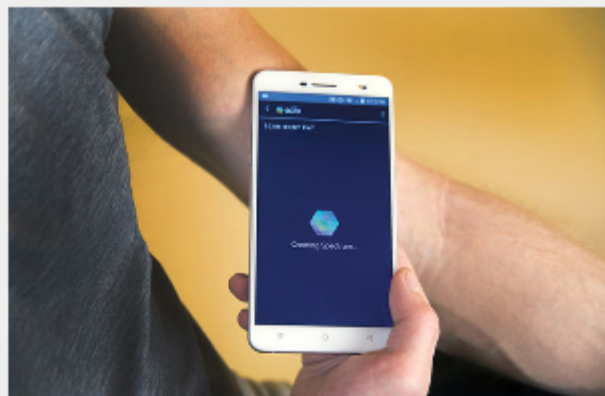
PHOTONICS MEDIA

### November 2018

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

### Smartphone Spectroscopy Takes the Lab to the People

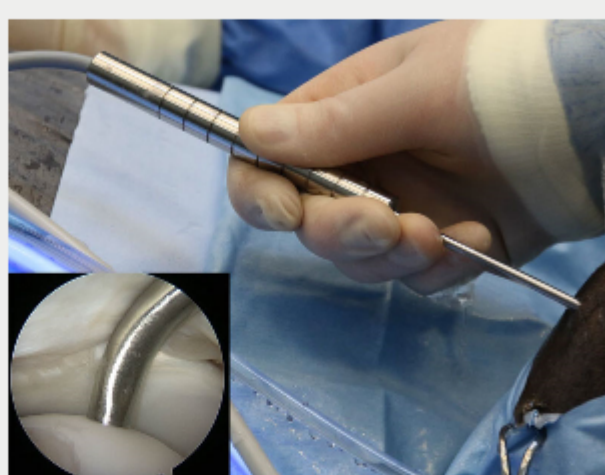
By 2020, the number of smartphone users in the world is expected to reach almost 2.9 billion – nearly doubling in six years from about 1.6 billion in 2014. Technology companies and researchers have been directly and indirectly imbuing smartphones with additional capabilities, including spectroscopy for biological and medical applications, among other uses.



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### NIR Spectroscopy Enables Accurate Evaluation of OA

An arthroscopic NIR spectroscopic probe could be used to quantitatively assess the health of joint tissues, improving physicians' ability to detect initial signs of post-traumatic osteoarthritis (PTOA). The surgical instrument utilizes NIR spectroscopy (NIRS) to detect cartilage and bone loss.

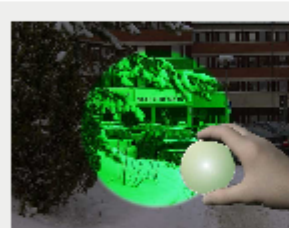


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**Bristol Instruments** Laser Spectral Characterization [bristol-inst.com](http://bristol-inst.com)

## Products



### IR Filters for Thermal Imaging and Gas Detection

**Spectrogon US**  
Spectrogon manufactures infrared filters and windows with high transmission, high rejection outside the passband, and introducing low cosmetic defects – while maintaining excellent coating uniformity --- for thermal imaging applications such as cryogenically cooled IR detectors and for uncooled microbolometers.

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### 771 Series Laser Spectrum Analyzer

**Bristol Instruments Inc.**

The 771 Series Laser Spectrum operates as both a high-resolution spectrum analyzer and a high-accuracy wavelength meter. With spectral resolution up to 2 GHz, wavelength accuracy as high as  $\pm 0.2$  parts per million, and an optical rejection ratio of more than 40 dB, the model 771 provides the most detailed information about a laser's spectral properties.

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### Breeze™ Palm Chemical Sensor

**BaySpec Inc.**

BaySpec introduces Breeze™ the world's smartest palm spectral analyzer in the 400 – 1700 nm range. The Breeze™ is highly efficient, ultra-sensitive, compact, and fast. For the first time, a smart device delivers laboratory performance in a handheld form.

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### Rhea: High-End Spectrometers

**Admesy BV**

Admesy's Rhea is a high-end configurable spectrometer platform that has been developed with industrial and R&D analysis applications in mind. This spectrometer series can be fine-tuned for different applications in the spectral range between 200 and 1100nm.

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### LIGHT: Introduction to Optics and Photonics, Second Edition

**Photonics Media**

Offering a comprehensive treatment of the subject as well as key applications, and employing minimal math, LIGHT: Introduction to Optics and Photonics was written with readers in mind. This textbook is for beginning students of optics

and photonics in high school, community college, and university STEM courses.

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### Short-Arc Mercury Lamp for Microscopy Systems

**Ushio America Inc.**

Ushio's USH-103D short-arc mercury lamps are designed for use in all 100W fluorescent microscope systems. With an extended life of 300 hours, the lamp consists of enhanced electrode design for precise positioning and high arc stability to ensure consistent quality and high performance.

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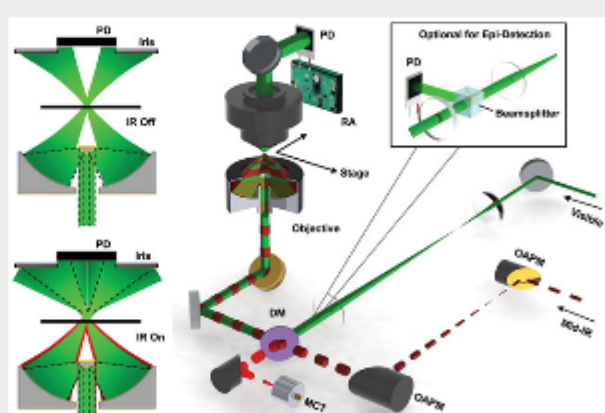
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## More News

### Photothermal IR Spectroscopy Boosts Chemical Microscopy, Expands Applications

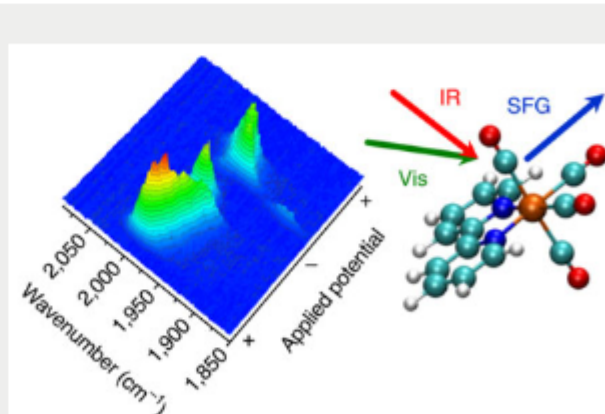
IR spectroscopy was once limited to sensing molecular vibrational absorption for chemical specificity. Now, IR spectroscopy-based photothermal microscopy is finding broader uses. Mid-infrared photothermal (MIP) microscopy probes the IR absorption-induced thermal lensing effect using a visible laser beam.



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### Spectroscopy Technique Could Lead to Ways to Convert Carbon Dioxide to Clean Fuel

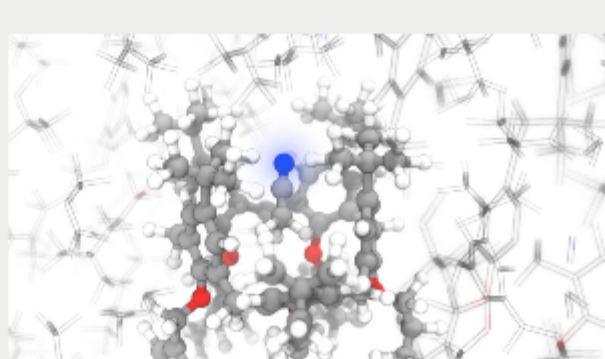
Optical spectroscopy is being applied by a team at the University of Liverpool to better understand electrocatalysis, a phenomenon that could enable more efficient conversion of waste products, like carbon dioxide, to usable energy.



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### ML and NMR Spectroscopy Predict Location of Atoms in Powdered Solids

One research team, from Ecole Polytechnique Fédérale de Lausanne (EPFL), is using machine learning (ML) to quickly predict chemical shifts of molecular solids and their polymorphs to within density functional theory (DFT) accuracy.



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### Optical Trapping and Raman Spectroscopy Are Combined to Measure Live Cell Interaction

Using multiple laser beams and Raman spectroscopy, researchers at the Universities of Nottingham and Glasgow have designed and built a new instrument that could help scientists learn more about how infections take hold and how antibiotic-resistant bacterial biofilms are formed.

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