# SAS SPECTRUM eNEWS



## Elemental Analysis

### Call for Pictures from Past SAS Events

We are still several months away from SciX 2017, but many planning meetings are already under way to organize various events for SAS members. We would like to put on a slide show at our Sunday Night Poster session with pictures from past members' events. If you have any memorable pictures, we will appreciate it if you can share them with us. Please send them to Bonnie Saylor exdir@s-a-s.org.

### Gordon F. Kirkbright Bursary Award, 2018

The Gordon F. Kirkbright bursary award is a prestigious annual award that enables a promising student/non-tenured young scientist of any nation to attend a recognised scientific meeting or visit a place of learning.

The fund for this bursary was established in 1985 as a memorial to Professor Gordon Kirkbright in recognition of his contributions to analytical spectroscopy and to science in general. Although the fund is administered by the Association of British Spectroscopists (ABS) Trust, the award is not restricted to spectroscopists. Applications are invited for the 2018 Gordon Kirkbright Bursary. The closing date for entries is 31 December 2018.

To download an Application Form or for further information visit, http://www.abstrust.org/, or contact abstrustuk@gmail.com.

### UK Student Bursaries for SciX 2017 Travel

The SAS UK Regional Section is this year making available four (4) student bursaries each of £250 for UK students giving an oral presentation at SciX 2017 in Reno, Nevada. Applications will only be considered after an abstract has been accepted for presentation by the SciX 2017 Program Committee. To apply for one of these bursaries the student must be a member of the SAS UK Regional Section. For further information or to apply for an Application Form, please email Joanna Denbigh at j.l.denbigh@salford.ac.uk.

### SAS Representation at SPIE.DCS

SPIE.DCS (Defense and Commercial Sensing) was held this year from April 9-13, 2017, in sunny Anaheim, California. This meeting is not typically seen as a meeting focused on applied spectroscopy, however, SAS members Richard Crocombe, Mark Druy, Steven Barnett, and Luisa Profeta (and others not named here), are trying to change that tone though the technical program. For the tenth year, the "Next-Generation Spectroscopic Technologies" conference was organized and held over two full days at SPIE.DCS.

*Next-Generation Spectroscopic Technologies Conference Chairs, (L to R) Steven Barnett, Luisa Profeta and Richard Crocombe (not pictured, Mark Druy).*

Monday's session started with a focus on laser-based spectroscopy, including a number of talks on quantum cascade lasers, with most focused on portability and methods of obtaining greater signal

output despite austere non-laboratory conditions. For the remainder of the day and moving into Tuesday morning, the focus moved to novel spectrometers and imaging instrumentation. Several groups focused on near-infrared (NIR) applications, discussed their technologies, and showed data of these pieces of equipment pushing the envelope on how modern spectroscopy is done in the lab and in the field. In a similar thread, the smartphones, data fusion and Raman session also demonstrated how even simulated data can be useful in academic institutions. Tuesday afternoon welcomed a new session into the conference, focusing on terahertz (THz) technologies. Several of the presentations focused on new materials science for making stable, portable terahertz lasers for different spectroscopy applications.


*Next-Generation Spectroscopic Technologies Conference Chairs, (L to R) Steven Barnett, Luisa Profeta and Richard Crocombe (not pictured, Mark Druy).*

Mark, Richard, Steven, and Luisa as well as others in the applied spectroscopy community believe that having an influx of SAS members presenting work at SPIE.DCS and other SPIE meetings would help with cross-pollination of ideas and technology. The call for papers for SPIE.DCS 2018, to be held in Orlando, Florida, opens in June 2017. The conference chairs are soliciting original papers in the following areas from those involved in research, system development, application engineering, and data analysis and processing, as well as users applying these systems for specific applications: (1) Novel enabling technologies for IR, NIR, Raman, terahertz, fluorescence, UV–Visible, (2) miniature, portable, and handheld spectrometers and imagers, (3) design considerations and theory for specific applications in the areas of defense and commercial sensing, and (4) system engineering and industrial design for solution-focused applications.

For further information about the "Next-Generation Spectroscopic Technologies" at SPIE.DCS please contact the Florida 2018 Conference Chair, Luisa Profeta at lprofeta@fieldforensics.com or luisaprofeta@gmail.com.

## STEM Education Benefits from Accessible Spectroscopy Tools

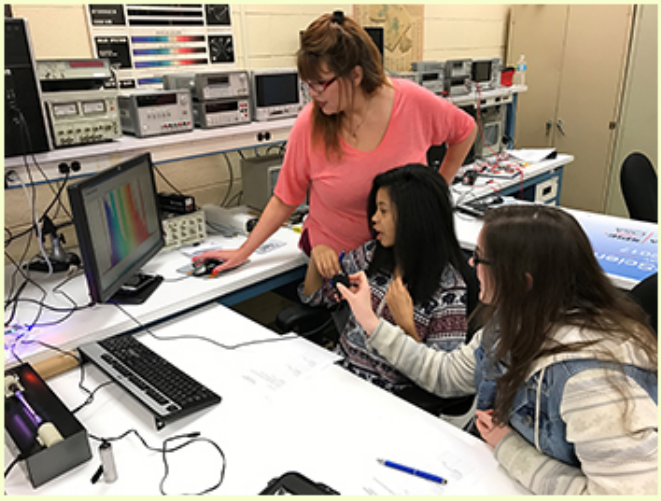
Students can now study basic scientific principles on the same world-class equipment used by leading researchers at university and government labs like NASA. Advances in electro-optics, high-speed array detectors, inexpensive optical fibers, and powerful computers have made fiber optic spectroscopy the sensing technique of choice for many real-world applications. Today's computing capabilities did not exist when miniature spectrometers were first developed; now computing and connectivity are making spectroscopy more accessible than ever.

The development and availability of scientific instrumentation and methods have changed in an equally dramatic way. In the past, cutting-edge scientific instruments were expensive research devices available only to well-funded research and development enterprises. Gradually, key technologies have filtered into general laboratory use, application-specific instruments, and educational settings.

Today's spectrometers are smaller, more flexible, and simpler to operate than the systems of the past. The introduction of modular spectroscopy has been a boon for educators, who can more readily help students appreciate the capabilities of optical sensing, the fundamental physics of the measurement process, the design trade-offs inherent in selecting and integrating components, and the discipline required to produce quality results.

Practically, as spectrometers have become smaller and less expensive, investing in multiple systems per lab is well within reach of most budgets. Many photonics companies both encourage and endorse science teaching through funding programs and training assistance.

For example, in addition to mix-and-match components, Ocean Optics has packaged its robust, small-footprint spectral sensing systems with the ideal combination of accessories and software to help bring the excitement of spectroscopy to STEM labs everywhere. These convenient, affordable kits are ideal for demonstrating a wide range of concepts through absorbance, transmission, fluorescence, emission, and pH measurements. With the modular components in the spectroscopy toolkits, the students assemble their own spectroscopy setup giving them a glimpse inside the black box instruments they may have used before. Sample experiments using household chemicals are available for download or educators can design their own experiments.



Thousands of science educators have utilized spectrometers to create relevant and exciting experiments to teach their students and enrich their lives with a greater understanding and appreciation for science.

A recent example of STEM outreach using modular spectroscopy teaching kits is the "Tech Like a Girl" workshop organized by Constance Boahn, Central Carolina Community College (CCCC) Engineering and Information Technologies Department Chair, at CCCC's Harnett Main Campus in Sanford, North Carolina. The workshop introduced young girls to spectroscopy and careers in science and engineering.

The workshop and purchase of several education kits was funded through a LASER-TEC grant. LASER-TEC is the Southeast Regional Center for Laser and Fiber Optics Education, established by the National Science Foundation in 2013. Nine girls participated in the workshop. The topic was "Spectroscopy Using Photonics." The girls learned what rainbows and spectrometers had in common and used the kits to measure the spectra from different light bulbs and to identify an unknown sample.

Inspiring and engaging today's tech savvy students is a challenge that requires innovative and interesting teaching tools. Modular spectroscopy toolkits with interchangeable components put the student in the driver's seat, allowing them to reconfigure their components for a wide range of measurements to explore various concepts. With tools like Ocean Optics spectroscopy kits, future scientists have the power to study the fundamentals of spectroscopy using modern instrumentation.

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**Do you have something spectroscopy-related you want to discuss in the newsletter?**
**Or something that will help our membership such as career tips or application tips?**
**Please let us know by emailing xchen4@dow.com.**




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