SAS SPECTRUM eNEWS

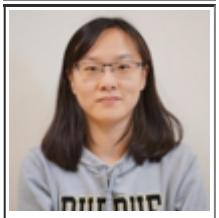
Editor's Note

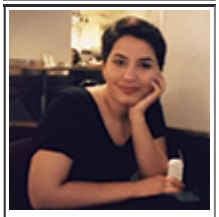
I contacted new SAS members who joined in the last several months for their profiles and was really moved by the responses I have received so far. I am also very impressed by the diversity of our new members, ranging from graduate students who just started their first encounter with applied spectroscopy, to professors and CEOs who have been living spectroscopy their whole life. Naturally, their motivation and needs are very different, yet are often quite complimentary to each other as more junior members generally look for guidance and networking with senior members ready to give back to the community by mentoring the newcomers. Let us all work together to make SAS more and more vibrant and relevant to all applied spectroscopists! Due to the large number of responses received, we will include the other half in our next issue.

Many of our members are using work email addresses for their official SAS correspondence. There are a number of reasons, such as change of employment or retirement, whereby that email may become invalid. Under those circumstances, a member could lose access to Society correspondence, and the Society Office or other SAS members may not be able to contact the member. We therefore strongly recommend that all our members supply a secondary (personal) email address in addition to their work email. Members can do that by logging into their account at the SAS website and editing their profile, or by sending a note to Bonnie Saylor at exdir@s-a-s.org.

Welcome New SAS Members

	Why did you join SAS and what do you hope to gain from SAS?	**What is your area of research?**	**What are your hobbies?**
	Priyanka Dey, Postdoctoral Research Fellow, University of Exeter, UK		
	Working with optical spectroscopy techniques, one of the ideal societies to be a part of is SAS and hence my interest in becoming one of its member. I would be looking forward to networking events of SAS and its travel awards, which are crucial for early career researchers like myself.	I work in designing plasmonic nanostructures to boost optically enhanced properties. I specifically investigate surface plasmon (LSPR), Raman (SERS) and chiral properties of the nanostructures for use in sensors and disease diagnostics.	I love travelling and promoting science to students and public.
	Beauty Chabuka, Student at Idaho State University, USA		
	I joined SAS because I wanted to join a network that provides a platform for possible employments opportunities in the chemistry (science) industry and be informed about conferences and also learn on how to expand/improve my CV. It is nice to interact with other students at other universities and to learn	I am analytical chemist (chemometrician) and my current research focuses on identifying microplastics using classification methods.	I enjoy being outside rock climbing, snow boarding in the winter, and going on hikes. The

	about some of their research work.		occasional movie and going out with friends.
	Sebastian Huelck, CEO, tec5, USA		
	Connecting with spectroscopists for information exchange, potentially having access to a talent pool to hire future employees	We are developing and manufacturing process UV–VIS, NIR, and Raman spectrometers, LIBS devices and do research for SERS and HSI	Evolutionary biology, cooking, traveling
	Changqin Ding, Student at Purdue University, USA		
	I got a recommendation from my advisor to know about SAS. I joined SAS in order to get to know more people in the spectroscopic area and to have more opportunities in career searching.	My research is focusing on high-speed polarization-dependent SHG imaging, automatic 3D imaging, quantitative phase contrast imaging and two-photon hyperspectral imaging for the detection of active pharmaceutical ingredients and biological tissues.	Ballroom dancing, drawing, and sewing.
	Unnamed, Professor at South China University of Technology		
	We recently sent an article to Applied Spectroscopy for publication consideration. At that time, I knew I had a chance to apply to be a member of the SAS. I hope to know more on the research works of our peers all around the world. And I hope SAS to be a good platform to let the members communicate each other.	My research interest is to develop rapid and sensitive elemental analysis technique based on laser-ablation. We have developed high repetition rate laser-ablation spark-induced breakdown spectroscopy on the sensitive elemental analysis of alloy samples. We have also apply laser-induced breakdown laser-induced fluorescence (LIBS-LIF) technique to analyze metals in natural water samples, alloys and medical herbs with high detection sensitivity.	I like biking, hiking, listening music, and reading books.
	Kimberly Evans, Student at Florida State University, USA;		
	I joined SAS to learn more about other fields of spectroscopy and to try to network.	My area of research is analytical chemistry focusing on separation of primary amine from islets of Langerhans and brain tissues using chiral MEKC.	Current hobbies include gardening, making hot pepper jelly, enjoying the outdoors, and playing video games.
	Adedapo Adeola, University of Pretoria, South Africa		
	I joined the SAS because it is a recognized and prestigious society of experts and researchers in the field of	Environmental pollution monitoring and control; material science.	Watching movies and football.

	spectroscopic analysis and characterization of materials or compounds of interest. I hope to gain up-to-date and hands-on skill in the application of spectroscopic techniques. I also would love to network with other researchers in the field via participating in conferences, workshops, and seminars.		
	Maryam Zare, student at University of Utah, USA		
	I joined SAS is that I am working in the spectroscopy region and I hope to meet new people in this area.	My research area is using confocal Raman microscopy to study the individual modified chromatographic particles and study the partitioning of small molecule and quantify them in the modified particles.	My hobbies are mainly walking, jogging, biking, reading books, and watching movies.

SAS Member Profile: Gloria Story, Senior Scientist at P&G

We heard that you co-taught a course at Pittcon 2019 on "Problems with FT-IR Spectra and How to Avoid Them". Can you tell us more about it? Do you plan to do more of it?

I joined Ellen Miseo (TeakOrigin) and Jenni Briggs (Pike Technologies), who have been teaching this course at PittCon for a few years now. We plan to offer the course at SciX2019 and PittCon 2020. The main topics of the course are on understanding the sources of problems from the instrument, from the accessory, from the sample, and other things to watch out for. I added content to their course on the following: (1) the importance of being scrupulous when collecting backgrounds, a bit laborious maybe, but it pays dividends when solving problems using residual analysis; (2) the importance of scrupulous data collection…and multiple samplings… when starting down the path of "Big Data". Multiple replicates of great spectra are needed; and (3) the importance of being involved in your professional societies—sources of great partners, resources, and knowledge.

You have certainly helped SAS a lot over the years. Can you tell us what motivated you to do that, and how did you benefit from SAS involvement?

I am very blessed to claim to have attended the "University" of Marcott, Noda, and Dowrey. It was their example of being involved that encouraged me to do the same. I wanted what they had—direct contact with top technical talent and informal mentoring with the founders of technologies we now take for granted. That access was the biggest benefit of my membership fees, a valuable return on investment. By serving my professional societies, I have gained confidence in my own capabilities, confidence in presenting my successes and failures in the lab (if the legal department signs off). I have grown as a leader of programs that benefit other scientists. My connections and network bring cutting-edge capability to my work mates.

Can you tell us what a typical day is like for you at work?

Between beating down the inbox overload, attending meetings that are critical as well as ones that aren't, and shoring up the confidence of a colleague, I sneak into the lab for vacation. After an hour or two of awesome science play, I slog the inbox a bit more, interpret a few tricky spectra, lament having to watch the same YouTube movie on how to create a trend line in Excel—again! I make time to laugh or cry with a colleague for a bit…and share my candy jar. Once the office quiets down, and the lights turn off, I crank up my software and mine my precious data for a few hours. Before I finally can't stand the computer another minute…I finish up a few professional society chores, read up on a scout's merit badge requirement, or collect prayer requests for my prayer line before heading home to a toasted sourdough peanut butter sandwich and 30 minutes of HGTV!

You are now a senior scientist. Can you talk about your earlier career and how your career trajectory from a student fresh out of school to your current position?

Even before I graduated with an Associate of Science degree, P&G came to our class, passed out applications, and hired just about all my graduating class. Looking back on that, I was so very lucky indeed. I worked for about three years in our packaged soap division, learning to collect HPLC, GC, and IR data, plus a lot of standard liquid column separations and mixed-phase titrations. I am proud to say that I had a hand in what is

now Liquid Tide today. My future husband was working in Curt's [Marcott] lab and we met in Howard Sloane's IR interpretation class. My husband planned to attend graduate school, so we packed up and moved to Utah. I restarted my career at Hercules Aerospace and learned about X-ray fluorescence and diffraction, as well as atomic absorption spectroscopy. Oddly enough, Curt helped me land that job as one of the scientists at Hercules was his high school classmate. When it was time to go back to Cincinnati, I contacted Curt…just to let him know I was coming back and would be looking at P&G to restart my career…again. Thankfully, he had an opening and decided to take a chance on me. We had 22 amazing years working together in the Corporate division, expanding our research in vibrational spectroscopy. Back in the late 80s and early 90s, the reward system in Corporate was based on your publication rate—internally and externally. For me, it was like working as a graduate student. I researched and published papers on surface modification and interface studies, photoacoustic depth-profiling, and infrared imaging. Oh, the excitement we experienced when Neil Lewis, Pat Treado, and Ira Levin brought their NIR focal plane to our lab and we had the first image of good old polystyrene collected on a step-scanning FT-IR! It was during this time that I became active in professional societies and published papers with some of the world's best spectroscopists. Lucky? You bet I am! I'm still in Corporate today, and while the rewards are based more on driving business results; innovation is still in our DNA.

What have been some of the biggest challenges in your career? Have you had to overcome some level of discrimination as a woman in your career path?

My biggest challenge is not having credentials. I graduated summa cum laude, but with an associate of science degree. I learned at the bench with amazing scientists, but other than a list of publications I still am in awe over, I have no pedigree. I consider myself fortunate that I never had to deal with discrimination as a woman scientist. That is one big benefit of working at Procter and Gamble. For being such a large corporation, I find our purpose, values, and principles to be very progressive and inclusive. I am blessed.

Over your years of involvement in the Society, what has been your most rewarding experience?

There have been so many rewarding experiences! I can think of two very special ones, though. First, was my very first SAS job—tour speaker coordinator. I poured over the Journal and researched all of the society award winners. I was so excited when most, if not all, the scientists I invited to be on the tour accepted! We had a record number of requests. I was stoked! Second, was being awarded the SAS Distinguished Service Award. I was so overwhelmed…and that was when I started my new message to myself and other members, just like JFK…it is not what our societies can do for us…it is what can we do for them and the people they serve!

Please share with us a moment that you would consider was an encounter with serendipity.

Oh, now you are really going to call me a geek! So, it went something like this. Back in the day…I was just three months into my first job at P&G. I was so very tired of reading books on HPLC and trying to get three LCs to like a reverse-phase method that was so full of salt that you didn't dare turn the pump off or it would seize. My boss (who ended up getting married to Curt a few years later!) shared the fateful news that we were selected to be one of the three labs to purchase an FT-IR! I fell in love with the Digilab FTS-15E as soon as it was installed! Complete chromatograms…I mean spectra…would show up on the screen in a mere five minutes! Wait…it gets better. One of my first triumphs was analyzing some goo material from a plastic bottle package. Now remember…no mouse…no internet…just books and a lightbox. I had this very distinctive spectrum to try to figure out. I am paging through the book of spectra…polymers and coatings…it's a red book and about an inch thick. Lo and behold…after about 50 pages in…I find my spectrum…right there! I couldn't believe it! It was so awesome…better than Graeter's Double chocolate chip ice cream (Cincinnati natives and lucky visitors understand—sorry)!!!

What's on your horizon at this point in your career?

I want to write one more paper that I hope Applied Spectroscopy will accept before I retire. I have a few experiments I would really like to try before I switch to full volunteerism. I wish I had a lot more time, but I'm going to take what I can and run with it. As my dear friend and P&G mentor Pete Rodriguez said, we've reached the cantankerous old-fart stage and we can get away with a bit more tinkering, just a bit more.

Contributed by Gloria Story and the SAS Newsletter team
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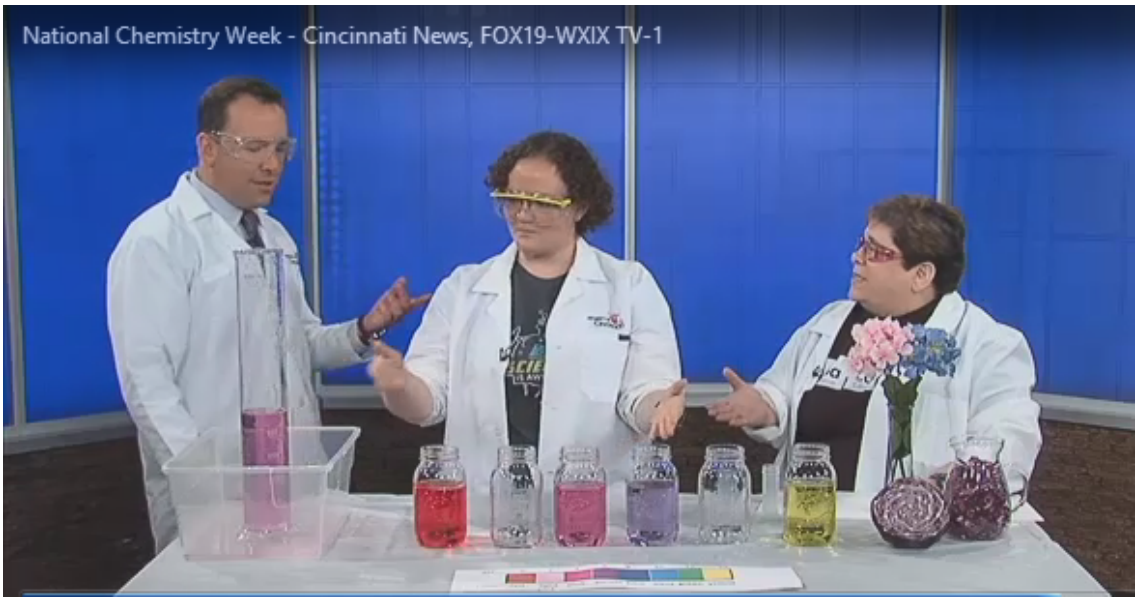

Anna Donnell (center) and Gloria (right) in a Cincinnati News still for National Chemistry Week 2016

Mentoring for the Spectroscopist

Career paths for those trained in the sciences are varied and may actually change career stages and variations in the job market. One of the original intents of many of the professional societies (Society for Applied Spectroscopy and the Coblentz Society) was to bring spectroscopists together to offer each other advice and support (mentoring), but this has changed. Geographically we are not typically close together enough for face to face meetings. And attendance at national meetings where people can interact has been curtailed by employers, but the need at all career stages is still there.

For the young spectroscopist finishing a degree, there are questions like:

- How do I get a job?
- What are the characteristics of working in:
    - Industry
    - Academia
    - Government
- What skills do I need?
- How does a big company differ from a start up?

For a mid-career professional there are a different set of questions:

- How do I juggle my jobs increasing demands with my family's increasing demands?
- If we move to take this terrific job I was just offered, what will my spouse (who has a good job in a similar scientific field) do?
- What are the pros and cons of moving with teenage age children?
- How would it be to work remotely?
- Would a field sales job in a technical field offer the challenges I want and the flexibility to live where my spouse is employed?

For the late career professional there may be a third set of concerns:

- Should I take the retirement packaged that my employer offered me in their current downsizing effort?
- I was not ready to retire? What will I do with myself if I retire?
- Could I set up a consulting business to work part time?
- What other options are viable? Should we move to another area and what would my prospects be there?

The Coblentz Society has successfully run a "Speed Mentoring" workshop at SciX for the past few years, which will run again at EAS in 2019 and possibly Pittcon in 2020. These have been useful, but a general opinion is

that there should be a mechanism to take this concept further. The Coblentz Society has taken the lead on an effort to bring together mentors and mentees. We have been invited to use a tool called CG Scholar to set up our community to test the concept of helping each other is viable. This is strictly aimed at connecting people who want advice to those who have done it already. We are not trying to force anything, but to provide a mechanism to connect people.

The idea is to have a forum where people can connect. This connection could be by email, phone, face to face, whatever works, and the connections would be designed to refer people in the right connection. Social networks such as LinkedIn could serve the same purpose, but it is a very large and it might be hard to start a conversation This suggested mechanism is small and possibly more focused—please give it a try. Join in at https://cgscholar.com/, fill out your profile with your mentoring areas and skills then search for SAS and Coblentz Spectroscopy Mentoring to join. Pass the information on and hopefully we will have a vibrant useful community to roll out to the spectroscopy community at SciX 2019.

Contributed by Ellen Miseo
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SAS Section News
New Section Benefit: Virtual Meeting Access

From the desk of your Regional, Technical Section Affairs Coordinator (RTSAC)—I am rather enjoying a new television show called "New Amsterdam". Its story is built around the medical director of a major hospital in a large city. This medical director, who is extremely handsome I must say, has a wonderful line he uses quite often in the show, "How can I help?" I am finally getting into the saddle as your RTSAC and I started by thinking what could help with my own local section as well as all the others.

We need a way to meet using digital tools. However, Webex and GoToMeeting services are too expensive. A church group I belong to starting using Zoom (https://www.zoom.us/). It works very well, unless your internet service is not the greatest, and the cost is amazingly reasonable. I proposed to the Executive Committee that we get an account and they approved a one-host license for a trial run. Bonnie Saylor, SAS Executive Director, manages this for us. I've used it so far to host a few meetings and a mentoring session between colleagues of mine and two aspiring Ph.D. candidates.

Sections can apply to the office to use the service for meetings and seminars (email exdir@s-a-s.org), hopefully making some of their meetings available to allow other SAS members to call in (you can advertise in this Newsletter). You can have over 100 callers with many webcams up simultaneously (you do not need a webcam to join in, but it is great if the speaker is on camera).

I believe having access to Zoom will help struggling sections stay together and have fruitful meetings. It just might help us keep our "tweener" members…after school times but before consulting days. Balancing work, babies, and families, along with professional society events is very challenging. Being able to log in for an hour…even on mute while rocking a baby—priceless!

This tool will also be helpful for our Society members to share content as webinars/training sessions. They can be saved as mp4s and posted on our website. There is cloud recording (files can then be downloaded to a computer or streamed from a browser via HTML5 or Flash) and local recording (users record meeting video and audio locally to a computer; the recorded files can then be uploaded to a file storage website like Dropbox, Google Drive, and/or a public streaming server such as LabTube or Vimeo).

I am excited to see how this virtual meeting service helps our Society thrive and grow. Give it a try—contact Bonnie (exdir@s-a-s.org) today!

Contributed by Gloria Story
Regional, Technical Section Affairs Coordinator
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New England SAS April Meeting, and Upcoming June Meeting

The most recent Northeast SAS meeting had as its speaker Dr. Anish Goyal, who is the Vice President of Technology at Block Engineering. The title of his talk was, "Trace Chemical Detection Using Hyperspectral Imaging with Quantum Cascade Lasers". Block Engineering is one of the contractors for the IARPA 'Standoff Illuminator for Measuring Absorbance and Reflectance Infrared Light Signatures' (SILMARILS) program. See https://www.iarpa.gov/index.php/research-programs/silmarils and https://spectrum.ieee.org/semiconductors/optoelectronics/us-spy-agencies-seek-tech-to-identify-deadly-chemicals-from-30-meters-away for details.

Handheld spectrometers have provided field analysis capabilities for the investigation of suspicious and hazardous materials, but they require the operator to get very close to the object in question, and if it is explosive of toxic, this may not be very desirable! So the ability to do stand-off detection is very significant. Stand-off Raman instruments have been developed, but in general they require very bright (non-eye-safe) lasers, so IARPA is interested in methods that use invisible and eye-safe infrared technology.

Dr. Goyal described Block Engineering's approach, which is to illuminate the target surface using miniature, rapidly tunable, external-cavity quantum cascade lasers (EC-QCLs). While these lasers are tuned in wavelength, a HgCdTe (MCT) camera synchronously captures images of the reflected light. Hypercubes, with 128x128 pixels and more than 200 wavelengths, are captured within 0.1 s. By operating the camera in a windowed mode to achieve higher frame rates, hypercubes with 79 wavelengths are captured in only 0.02 s. For each hypercube, the illuminated area is on the order of $1cm^2$. To measure larger areas, the laser beam is raster scanned across the target. The resulting hypercubes are found to be of high quality, and the spectra are consistent with physics-based signature models. This presentation described a variety of detection results, including solid particles on smooth surfaces (e.g., explosives and drugs), liquid agent simulants on a variety of natural outdoor surfaces, and detection results at both close range (1 m) and long range (20 m). The talk was well-received and stimulated a lively discussion period.

Contributed by Richard Crocombe
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New York Regional Section of SAS Student Poster Session is a Huge Success

The New York (New Jersey) Regional Section of the Society for Applied Spectroscopy (NYSAS) held their annual student poster session at the University of Albany. The meeting was coordinated by the Undergraduate students in Dr. Igor Lednev's group and sponsored by Horiba Scientific. The key note speaker invited was Dr. Isao Noda, Affiliated Professor at the University of Delaware, Department of Materials Science and Engineering. The meeting was held on May 1, 2019 from 5-7:30 pm in the Life Sciences building. Undergraduate student poster presentations were on display during the dinner portion of the meeting and offered an opportunity for the students to meet with Dr. Noda and industrial colleagues and discuss their research.

The title of Dr. Isao Noda's key note presentation " Two-Dimensional Correlation Spectroscopy and Development of Biopplastics Nodax" was an interesting retrospective story pertaining to his journey in developing a biodegradable polymer for use in consumer products. Dr. Noda received his M.S. in bioengineering (1976), as well as M.Phil. (1978) and Ph.D. (1979) in chemical engineering from Columbia University, New York. In 1997, he received a D.Sc. degree in chemistry from the University of Tokyo. He worked for the Procter and Gamble Company (P&G) in Cincinnati, Ohio, from 1978 to 2012. After his retirement from P&G, he became an Affiliated Professor at the University of Delaware and also holds the position of Chief Science Officer and Senior Vice President at Danimer Scientific in Bainbridge, Georgia. His research interest is in the broad area of polymer science and spectroscopy.

Dr. Noda is widely recognized for his scientific contributions and has received a number of prestigious awards including the 1991 SAS William F. Meggers Award, the 2002 Coblenz Society Williams–Wright Award, the Cincinnati Section of ACS Chemist of the Year award in 2005, the 2009 International Academic Cooperation and Exchange Medal from the Chinese Chemical Society and Chinese Optical Society, the NYSAS Gold Medal award winner in 2009, and the Ellis R. Lippincott Award in 2011. In 2011, he became a SAS Fellow, in 2013 an Honorary Member of SAS, and in 2012, a Fellow of the Optical Society of America.

The theme of the presentation was how two-dimensional correlation spectroscopy (2D-COS) was pivotal in helping to interpret spectral data collected to better understand polymer performance characteristics. The spectral methodology guided development of the Nodax polymer technology. 2D correlation spectroscopy is a data analysis method that can simplify a set of complicated spectra consisting of many overlapped peaks. It provides enhancement of spectral resolution by spreading peaks over a second dimension, and establishes unambiguous assignment of correlation bands coupled by interaction mechanisms. 2D correlation spectroscopy has played a key role in the molecular design and characterization of a class of bio-based and fully biodegradable plastics, which is now commercialized by Danimer Scientific in Bainbridge, GA under the trade name of Nodax. Danimer's Nodax belongs to a very interesting class of aliphatic polyesters called poly(hydroxyalkanoates) or PHAs, which are found as intracellular inclusion bodies in various microorganisms. Because they are made by bacteria, PHAs are fully biodegradable under right conditions. However, most of PHAs known in the past had serious shortcomings in their physical properties to be a useful material. The 2D-COS methodology applied to a series of spectral data collected during mechanical deformation of PHA and various co-polymers provided critical insight into a way to modify the molecular structure of PHA to make this class of biomaterials much more useful, and inexpensive to become a viable replacement for conventional petroleum-based plastics.

The talk covered the background and interpretation of 2D correlation spectroscopy and several example applications including; Time dependent change during solvent evaporation of mixtures of polymers, temperature

dependent NIR spectra of oleyl alcohol. Dr. Noda reviewed the early development, and fundamental research carried out on Nodax PHAs using this versatile spectroscopic technique. One key element of wisdom shared with the students was "Fundamental Science is Key to Materials Development".

We had 25 students and industrial members attend the meeting. Debbie Peru presented Dr. Noda with an engraved NYSAS prism paperweight as a token of appreciation. Jalissa Thomas, undergraduate student in Dr. Lednev's group, presented the student poster presenters with a gift card as a token of appreciation for their time and excellent contributions. Most notable was that this event was attended by three past NYSAS Gold Medal Award winners: Dr. Isao Noda (2009), Dr. John Reffner (2014), and Dr. Igor Lednev (2018). The students had a great time and benefitted greatly from this experience.

New York/New Jersey Section, Society for Applied Spectroscopy (NYSAS)

You are cordially invited to the annual NYSAS Student Award Celebration and Officer Recognition Banquet! Please join us to celebrate our student spectroscopists.

Date: Saturday, 13 July 2019, 5:00pm–8:00pm.
RSVP by 5 July by email to debperu@outlook.com or via mobile phone, (908) 894-8412

Location: Department of Chemistry and Chemical Biology
Rutgers University, 610 Taylor Road
Piscataway, New Jersey 08854

Our Winners
Graduate Award: Jing Li (SUNY Binghamton)
Undergraduate Award: Philip Charles (Rensselaer Polytechnic Institute) and Alexander Green (SUNY Fredonia)

Keep an eye on the NYSAS website www.nysas.org for further details and possible late changes in date or events.

Contributed by Debbie Peru
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Upcoming Conferences and Meetings

For a complete list of upcoming spectroscopy meetings and conferences visit the SAS Website Spectroscopist Calendar: https://www.s-a-s.org/spectroscopists-calendar/

Announcing the Third Biobrillouin Meeting

It is our honor to welcome you to the Third Biobrillouin Meeting, Porto, Portugal, from 25–27 September 2019.

This conference provides a range of oral and poster presentations reviewing the latest developments in the field of Brillouin light scattering microspectroscopy for biological and biomedical research and applications. The event will host leading researchers in the field, offering a wide range of networking opportunities. Topics covered include (but are not limited to): medical and clinical applications; phenotyping and novel applications in the life sciences; instrument/technique design and development and data analysis; complementary and comparative studies and techniques.

Contributed by Francesca Palombo
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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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