

SAS SPECTRUM eNEWS

Society of Applied Spectroscopy Announces New Spectroscopy Certification Program

The SAS Spectroscopy Certification Program is designed to

- Serve the needs of spectroscopists who wish to establish and validate their professional credentials.
- Serve as a guide in defining minimum standards of education and experience for professional spectroscopists, and to encourage all practicing spectroscopists to meet such standards.
- Assist the public in identifying spectroscopists by establishing a procedure for critical peer evaluation based upon defined minimum education and experience and ethical guidelines.

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Council for Near-Infrared Spectroscopy (CNIRS) Profile

Over the next few Society for Applied Spectroscopy (SAS) Newsletters, affiliate organizations as well as technical and regional SAS sections will be highlighted to give SAS members more information about these groups and their activities to promote applied spectroscopy. This article will focus on the Council for Near-Infrared Spectroscopy (CNIRS), one of two technical affiliate SAS organizations. —Luisa T.M. Profeta

The Council for Near-Infrared Spectroscopy (CNIRS) is a US-based sister organization of the International Council for Near Infrared Spectroscopy (ICNIRS). Its objective is to advance and disseminate knowledge and information concerning the art and science of near-infrared (NIR) spectroscopy and other allied sciences. The CNIRS is a technical affiliate of the Society for Applied Spectroscopy (SAS) and a sponsoring member of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS).

To fulfill its mission, the Council supports a number of activities aimed at bringing together experts in the field of diffuse reflectance through conferences, awards, and scientific communications. The CNIRS sponsors the International Diffuse Reflectance Conference (IDRC), which takes place every even year at Wilson College in Chambersburg, Pennsylvania, since 1982 and is often referred to as the "Chambersburg Conference". CNIRS presents several awards, including: the Gerald S. Birth Award, given for outstanding innovation in diffuse reflection or diffuse transmission spectroscopy, the IDRC Travel Fellowship, which supports students and scientists who might be unable to attend our biannual conference without additional financial aid. CNIRS also bestows Honorary CNIRS Membership to individuals who have made exceptional contributions to the field of NIR spectroscopy voted on by the Governing Board of CNIRS.

The 2016 IDRC conference, chaired by Dr. David Funk, took place from July 31 to August 5, 2016, and brought together 121 participants from the worldwide NIR and diffuse reflectance communities. The Council sponsored eight (8) travel awards, awarded the Gerald S. Birth Award to Dr. Eric B. Brauns, of the University of Idaho, USA, for his outstanding work on the theory of diffuse reflection and awarded Susan Fouk with an honorary membership for her service to the organization.

The Council promotes scientific communication by supporting the publication of the CNIRS Corner column in NIR News, providing members with an opportunity to communicate with their peers and others within the global NIR community. The Council also promotes outreach by supporting SciX (formerly the FACSS Conference) by sponsoring sessions for the 2016 meeting.

If you want to learn more about the Council for Near-Infrared Spectroscopy, we encourage you to visit the [CNIRS website \(www.cnirs.org\)](http://www.cnirs.org) or contact us at info@cnirs.org. —Benoît Igne, President, Council for Near-Infrared Spectroscopy

Spectroscopy in the News: Raman on Mars

Since Chris McKay's Keynote lecture at SciX 2012 in Kansas City, Missouri, on "Remote Spectroscopy in the Search for Life on Other Worlds", many of the new and innovative spectroscopy-based technologies used for planetary and space research have been making headlines periodically. Most recently, Nicola Ferralis et al. from Massachusetts Institute of Technology (MIT) have made headlines with their publication in Carbon discussing the use of micro-Raman spectroscopy for the assessment of content in fossils.

This methodology, centered on modeling characteristic disordered and graphite carbon features in the 1100–1700 cm^{-1} region in organic matter, will enable the 2020 NASA Mars rover to "...quickly and non-invasively identify sediments that are relatively unaltered, and that maintain much of their original composition." If SHERLOC (Scanning Habitable Environments with Raman and Luminescence for Organics and Chemicals) uses the MIT processing, it would allow NASA scientists to have an idea if former life existed on the planet compared to studying rocks exposed to the extreme temperatures and radiation that have historically been collected and returned to earth for further study.

They tested the method of processing the hydrogen to carbon ratios on well-characterized kerogen and discovered they that were able to determine the hydrogen to carbon ratios in a short amount of time using micro-Raman and their modeling. Additionally their research included mapping a single microscopic fossil of a protist, using micro-Raman and the analytic modeling. Roger Summons, professor of earth, atmospheric, and planetary sciences at MIT states that the mapping of the protist shows, "[t]he fossil has seen the same thermal history throughout, and yet we found the cell wall and cell contents have higher hydrogen than the cell's matrix or its exterior... That to me is evidence of biology."

With this method, MIT researchers and NASA hope to discover more information about whether life did exist on Mars in the past, and more about how they survived as data starts rolling in after 2020.

References:

<http://news.mit.edu/2016/new-technique-detect-martian-life-0816>

<http://www.sciencedirect.com/science/article/pii/S0008622316306121>

Day of Photonics: 21 October 2016

In 2015, organizations such as SAS helped sponsor and celebrate the International Year of Light. This yearlong celebration was intended to help the world as a whole "[focus] on the topic of light science and its applications... [while] promoting improved public and political understanding of the central role of light in the modern world."



This year, SAS members once again have an opportunity to outreach to their local and world-wide community by participating in the Day of Photonics, a biennial event promoting photonics. The European Photonics Industry Consortium (EPIC) is the managing group for the Day of Photonics, and encourages scientists and photonics-lovers world-wide to organize and promote the day. Given the proximity of the Day of Photonics to Mole Day (23 October), there are plenty of avenues to excite and inspire the next generation of scientists and engineers. Some ideas EPIC suggests for any university, school, industry business or organization to help celebrate the Day of Photonics:

- Companies organize school visits and welcome students to their company
- Companies organize an open-day and invite other companies in the neighborhood to make an introduction to their company
- Companies organize an internal meeting with their sales/business development staff to discuss how their company is positioned in the various photonic markets
- Companies organize family days and invite children to discover the working environment of mom and dad
- Research organization and universities organize school visits
- Student chapters reach out to schools to explain what is photonics

SAS encourages individual members as well as local chapters (both student and professional) to help celebrate the Day of Photonics! For more information about the Day of Photonics, please check out the EPIC website: <http://day-of-photonics.org/>.

Foil Miller, A Giant Among Spectroscopists 1916–2016

Foil A. Miller, age 100, chemistry professor emeritus at the University of Pittsburgh, died peacefully in his sleep in Glenview, Illinois, on September 20, 2016. He was born in Aurora, Illinois, on January 18, 1916 and raised in the village of Pepin, Wisconsin. Foil was predeceased by his wife of 65 years, Naomi, and is survived by sons Bruce and Craig, a granddaughter, and grandson and great-grandson.

After Foil obtained a B.S. in chemistry at Hamline University, St. Paul, Minnesota, he earned his Ph.D. at Johns Hopkins University. Following a postdoctoral fellowship at the University of Minnesota with Professor Bryce Crawford, he taught for four years at the University of Illinois. He moved to Pittsburgh, Pennsylvania, in 1948 to join the staff of Mellon Institute as Head of its Spectroscopy Division. In 1967, he transferred to the University of Pittsburgh as University Professor and Head of the Spectroscopy Laboratory. He retired from Pitt in 1981.

His research, which has been primarily in infrared and Raman spectroscopy, has been described in about 100 publications. It involved problems with vibrational assignments and in molecular structure and bonding. He was a co-Editor of *Spectrochimica Acta* (1957–1963) and Secretary of the IUPAC Commission on Molecular Structure and Spectroscopy (1969–1975). In 1957–1958, he held a Guggenheim Fellowship in Zürich. He was a Visiting Professor in Japan in 1977 and in Brazil in 1980. He received the 1964 Pittsburgh Spectroscopy Award, the 1965 Pittsburgh Award of the American Chemical Society, and the 1973 Hasler Award of the Society of Applied Spectroscopy.

Foil gave over 400 invited professional talks, including 32 speaking tours for the American Chemical Society. The latter may be a record. One talk, "Great Mistakes in Science", was given 144 times. He may have held another record in his last years of being the world's earliest Raman and infrared spectroscopist then living. He began work in Raman in 1939 and in infrared in 1941. He is also one of the few people to have seen conventional Raman lines with his naked eye.



Among Foil's hobbies was collecting stamps dealing with chemistry and physics. He authored over 180 articles concerning or using them. In 1998, he and Professor Edgar Heilbronner of Switzerland coauthored the book *A Philatelic Ramble Through Chemistry* that is regarded as the bible on the subject.

Foil was an instructor in the workshops in infrared and Raman spectroscopy that were first held at MIT and are now held at Bowdoin College from their inception in 1950 until 2002, missing only the year when he was in Zurich. In this role, he affected the lives of thousands of spectroscopists by his encyclopedic knowledge of band assignments and his gentle sense of humor. In those years when spectra were displayed as 35 mm slides, he was responsible for surreptitiously inserting slides into the carousel that contained his, or his fellow lecturers' presentations, that simply announced "Baloney!", "Hogwash!" or "You have exceeded your time limit!" much to the amusement of the participants. It certainly kept their attention. The "Bowdoin course" developed an international reputation and Foil and his colleagues taught it eleven times in Europe (Norway, Sweden, the Netherlands, Hungary, and England) as well as China and Mexico. It is part of Foil's legacy that this course is still taught each July at Bowdoin College.

What is important is Foil's approach to the subject he loved. He cannot simply be summed up by the number of articles he published or the number of presentations he gave. Foil's contribution was how he approached spectroscopy, his colleagues, and life. He was gracious, although the foolhardy learned rather quickly that he did not suffer fools gladly. He set a standard, not only for himself, but also for those who worked with him. He constantly challenged dogma or simple explanations and sought the truth. His criticisms of his colleagues' work were always constructive and if the advice were taken with an open mind he truly helped his colleagues and the benefits were passed on through them. He never stopped examining his understanding of phenomena and he was quick to share his insights.

In later life when Foil worked with the infrared courses, it was clear what great rapport he had with people. For years after he retired from the courses, we would meet many people who asked after him and recollect what a pleasure it had been to learn from him. Clearly, he had a magnetic personality. At many courses, in the U.S. and overseas, Foil was often surrounded by a group of young ladies. They just gravitated to him. He was always charming and treated everyone very kindly and with respect.

Foil's interests in science and instruction did not end when he retired from the infrared courses. Foil continued to read the literature and would often comment on recent articles. In addition, he had amassed a large collection of slides from his travels. He would give lectures at continuing care facilities and local libraries on a variety of topics through age 100! His curiosity and desire to learn never waned.

Foil was unique. His dedication and scholarship are rarely seen. He has taught thousands of people about many aspects of spectroscopy and science, but we believe he also taught people about life and how to treat others. He was the last of the pioneers of vibrational spectroscopy and was a true gentleman. He will be greatly missed by the entire spectroscopy community. —*The Family and Friends of Foil A. Miller*