



May 2011

2011 SAS TOUR SPEAKER JOSEPH CHAIKEN PRESENTS AT NEW YORK SECTION

by Xujin Lu

On Wednesday, March 9, the New York section hosted Professor Joe Chaiken of the Syracuse University Chemistry Department for an invited talk as part of the 2011 SAS Tour Speakers Program. During the talk, Chaiken reviewed his research and development efforts aimed at noninvasive blood and tissue analysis devices.

Roughly 50 years passed between the conception of noninvasive measurement of the degree of oxygenation of blood (SpO₂) by passing light through the skin and the commercial realization of modern pulse oximetry.

Improvements to that technology are still being introduced, according to Dr. Chaiken. Roughly 35 years have passed since the conception of noninvasive glucose measurement and yet few techniques introduced during that period remain realistic commercial prospects to achieve that hallowed goal. In the 10 years since the initial publication of actual noninvasive *in vivo* concentration

measurements of blood glucose in humans, at least two other groups have corroborated their results, using different modus operandi, indicating that Raman spectroscopy has sufficient sensitivity and selectivity to equal the quality of care provided by fingerstick technology.

The presentation started after an informal dinner and was held on the Colgate-Palmolive Campus in New Brunswick, NJ. The attendees enjoyed the talk and were attracted by the results using the noninvasive blood glucose device and the underlying spectroscopy. A detailed discussion elaborated the human factors and specialized instrumentation needed for accurate and reproducible measurements. Dr. Chaiken further presented a new algorithm for the noninvasive measurement of blood hematocrit using only the Rayleigh scattered remitted light and the combined fluorescence and Raman emission, all produced by probing fingertip skin with a single near-infrared laser.

Dr. Chaiken earned a BS with honors in Chemistry from the University of Chicago in 1977 and a PhD in Physical Chemistry at the University of Illinois at Urbana-Champaign working with Prof. J. D. McDonald in 1982. His early research focused on quantum beat spectroscopy and radiationless processes in intermediate case molecules and

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included the first observations of vibrational-electronic quantum beats. He has been a Professor of Chemistry at Syracuse University since 1982 and his research has spanned a broad range of spectroscopy. For most of the last dozen years, he has been exploring noninvasive *in vivo* biomedical spectroscopy. He is also the Chief Science Officer of LighTouch Medical, Inc and in 2000 published the first noninvasive, *in vivo* Raman spectrum of human blood.

As for prospects for development of commercial devices, Chaiken was very optimistic and offered his view of the future. He concluded: "While we do not expect to eat the turkey this Thanksgiving, or perhaps even over the next two, we are confident that its goose will eventually be cooked."

After his talk at NYSAS, Dr. Chaiken continued his tour to the Detroit and Cleveland local sections.

Obituary – Richard Nyquist

Dr. Richard Allen Nyquist, 82, of Midland, MI, died Tuesday morning, January 4, 2011, at Mid-Michigan Medical Center. He was born May 3, 1928, in Rockford, Illinois, the son of the late Harry William and Anna Svea (Nelson) Nyquist. On January 28, 1956, he married Irene Cote in Midland.

Nyquist received his B.A. in chemistry from Augustana College, Rock Island, Illinois, his M.S. from Oklahoma State University, and his Ph.D. from Utrecht University, the Netherlands. Dr. Nyquist is the author or coauthor of more than 160 scientific articles including books, book chapters and patents. He worked at The Dow Chemical Company for over 41 years and achieved the final rank of Research Scientist.

In 1985 Dr. Nyquist received the Williams-Wright Award from the Coblenz Society for his contributions to industrial IR spectroscopy. He was subsequently named an honorary member of the Coblenz Society for his contributions to vibrational spectroscopy, and in 1989 he was a national speaker for the Society of Applied Spectroscopy. The Association of Analytical Chemists honored Dr. Nyquist with the ANACHEM Award in 1993 for his contributions to analytical chemistry. He is listed in Who's Who in Science and Engineering, Who's Who in America, and Who's Who in the World. The Dow Chemical Company, from which Dr. Nyquist retired in 1994, honored him with the V.A. Stenger Award in 1981 and the Walter Graf European Award in 1994 for excellence in analytical chemistry. He has also been a member of ASTM and received the ASTM Award of Appreciation for his contributions to the Practice of Qualitative Infrared Analysis. In 2000 Dr. Nyquist was awarded honorary membership in the Society of Applied Spectroscopy for his exceptional contributions to spectroscopy and to the society.

In 1995 The Dow Chemical Company established the Nyquist Analytical Award for a candidate's long-term contributions to analytical technology. After retirement from Dow, Dr. Nyquist served as consultant in vibrational spectroscopy at Michigan Molecular Institute, Midland.

Dr. Nyquist is survived by his wife Irene of Midland, sons Richard Harry Nyquist of Boulder, CO, Robert Allen Nyquist and his wife Lisa of Dayton, OH; daughters Jean Susan Nyquist and her husband James Hansen of Denver, CO, Kathryn Ann Nyquist of Thornton, CO; brother Roger Thomas Nyquist of Sacramento, CA; two grandchildren, Benjamin Allen Nyquist and Hannah Dee Nyquist.

Dick will always be remembered by his colleagues for his ability to use vibrational spectroscopy to solve difficult analytical problems. His ability to interpret IR spectra was extraordinary and could not be matched by any electronic library or search algorithm. Dick's sense of humor and his kindness towards others made him a beloved fixture at Dow. His legacy endures in the vibrational spectroscopists that he taught and mentored.

Inaugural Meeting UK Regional Section of Applied Spectroscopy

The UK Regional Section of Applied Spectroscopy will host its inaugural meeting on May 17, 2011, at Manchester Interdisciplinary Biocentre, 131 Princess Street, The University of Manchester, M1 7DN. The program, a registration form, and a map are provided below. We look forward to seeing you at this exciting event.

UK REGIONAL SECTION OF THE SOCIETY FOR APPLIED SPECTROSCOPY (SAS) INAUGURUAL MEETING

Spectroscopy in BioMedical Analysis

May 17th, 2011

Manchester Interdisciplinary Biocentre, 131 Princess Street, The University of Manchester, M1 7DN

(more information is given on: <https://sites.google.com/site/sasukregion/>)

10:15 ARRIVAL AND COFFEE

Session Chair – Peter Gardner (Manchester University)

10:55 Welcome by Host **Peter Gardner (Manchester University, UK)**

11:00 Inaugural Speech **Curtis Marcott (President of the SAS)**

11:10 Outline of UK's SAS Mission **Pavel Matousek (Chair, UK's SAS Regional Section)**

11:15 Infrared and Raman Micro-Spectroscopy for Medical Diagnosis and Imaging, and for Cell Biological Studies

Max Diem (Northeastern University, Boston, USA) / SAS Tour Speaker

12:00 Infrared Analysis at the Single Cell Level: The Age of Enlightenment

Peter Gardner (Manchester University, UK)

12:30 LUNCH

Session Chair – Pavel Matousek (Rutherford Appleton Laboratory)

13:30 Novel Nanorod Array Substrates as a Platform for SERS-Based Biosensing of Infectious Disease

Richard Dluhy (University of Georgia, USA) / SAS Tour Speaker

14:15 Functionalised Nanoparticles and Surfaces for Bioanalysis by SERS

Duncan Graham (Strathclyde University, UK)

14:45 Enhancing Raman Spectroscopy for Quantitative Bioanalysis

Roy Goodacre (Manchester University, UK)

15:15 TEA

Session Chair – Caroline Rodger (AstraZeneca)

15:45 Where Can Raman Spectroscopy Have an Impact in Clinical Diagnostics?

Nicholas Stone (Gloucestershire Royal Hospital, UK)

16:15 Nanoscale Chemical Composition Mapping at 100 nm Spatial Resolution with AFM-Based Infrared Spectroscopy

Curtis Marcott (Light Light Solutions, Athens, GA, USA)

16:45 END

REGISTRATION FORM (Return by May 10th , 2011) The registration fee is **FREE** for students (incl PhD), unemployed and retired (but all must register before the deadline), **£40 for SAS members** and **£65 for SAS nonmembers**. Payment can be made by either cheque (Payable to 'SAS UK REGIONAL SECTION') or by bank transfer (Sort code: 55-61-02 and Acc.No: 66079330).

Please note that numbers are limited and places will be allocated on the first come first served basis. Deadline for registrations is May 10th. **No registrations will be possible on the day of the meeting.**

Please return registration form to John M. Chalmers, VS Consulting, 14 Croft Hills, Tame Bridge, Stokesley TS9 5NW. (If paying by bank transfer please send in a fax copy of the transaction **no later than May 10th, 2011.**

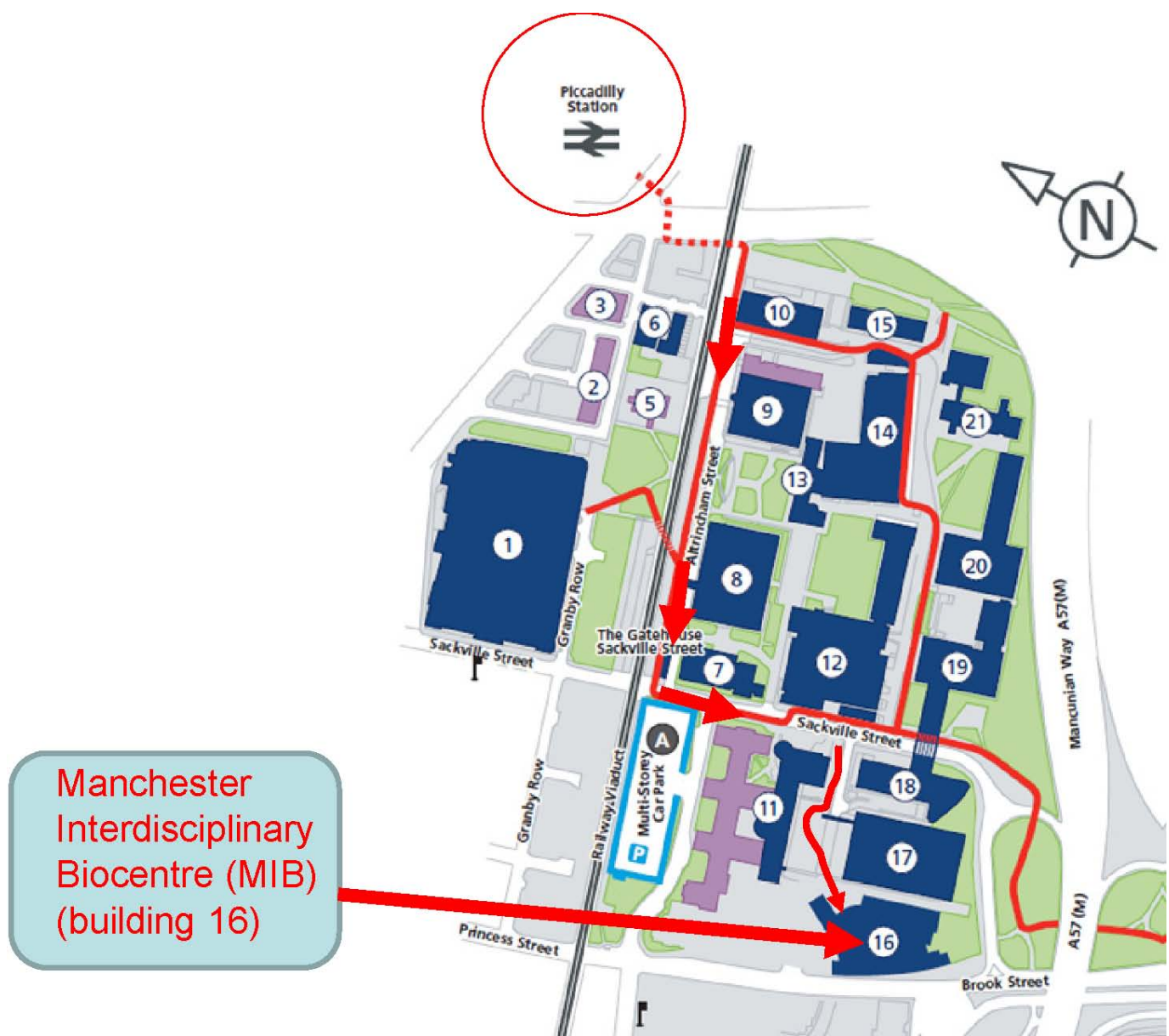
Alternatively, please email your details to JohnMChalmers@aol.com

Please reserve FREE places, places at £40 and places at £65 for the meeting on May 17th, 2011.

I require vegetarian meals.

Attendee Name(s) and Affiliation(s)

Contact Email(s)



SAS Student Ambassador Program

SAS is inviting its students to participate in the Student Ambassador Program. This program provides students the opportunity to represent the society at a variety of conferences focused on spectroscopy.

Responsibilities of a SAS Student Ambassador:*

- Organize and decorate a table with SAS provided pamphlets, journals, etc.
- Engage in candid discussions about SAS benefits with students at the conference
- Acknowledge SAS in any posters or oral presentations given at the conference

*Student Ambassador responsibilities will be secondary to any presentations given at the conference.

In return for your generous service, **SAS will pay for registration** to the conference. Unfortunately, travel and hotel expenses cannot be covered.

Available conference: ICAVS (International Conference for Advanced Vibrational Spectroscopy)

June 12 – 17, 2011 – Sonoma, CA

\$450 Student Registration (food + 2 excursions).

Please register by April 15! www.icavs6.org

Only students who are enthusiastic to represent SAS will be selected. To apply you must provide a brief description of why you would like to represent the society along with a firm commitment to attend the conference. Students who participate in local sections are strongly encouraged to take advantage of this opportunity.

The contact to apply or for questions is John-David McElderry, SAS Student Representative:
jdmcelderry@gmail.com

May Historical Events in Spectroscopy by Leopold May, Catholic University

May 2, 1922



George Claude Pimentel, who was born on this day, did research in the development of chemical lasers, matrix isolation techniques and rapid scan infrared spectroscopy.

May 5, 1811



Two hundred years ago on this date John W. Draper was born. He was a pioneer in photography and improved on Daguerre's process. He developed the proposition in 1842 that only light rays that are absorbed can produce chemical change. It came to be known as the Grotthuss-Draper law when his name was teamed with C.J.T. de Grotthuss, a prior promulgator of the same idea in 1817. Draper served as the first president of the American Chemical Society.

May 12, 1910



Dorothy Crowfoot Hodgkin was born on this day. She determined the structure of Vitamin B₁₂ using x-rays and won the Nobel Prize in Chemistry in 1964 for her determinations by X-ray techniques of the structures of important biochemical substances.

May 17, 1836



One hundred and seventy-five years ago on this date, Joseph N. Lockyer was born. In 1868, he discovered helium (He, 2) in the Sun. Pierre J. C. Janssen simultaneously observed this.

May 24, 1686



Three hundred and twenty-five years ago on this date, Gabriel D. Fahrenheit was born. He improved thermometers by using mercury (Hg, 80) in 1720 and invented the Fahrenheit temperature scale.

Comments to david.butcherATanalytchem.org