

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Ra	Ac															
		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
		Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		



Dr. Diane Beauchemin

31 December, 2021

Dear members,

I hope that this message finds you well. Unfortunately, CSASS is in poor shape. Despite the National Executive Committee (NEC) organizing some virtual mini-symposia in September, October and November, few attended and no one joined CSASS. Although the original intention was to post recordings of the events on the CSASS website to increase visibility, the idea was abandoned after the first symposium on Isotope Ratio Measurements and their Applications, which was kindly hosted by Isomass Scientific and

ThermoFisher Scientific, because of numerous technical issues during the event. As a result, some of the speakers were not comfortable with their talks being posted. Attendance was a little better at the two mini-symposia graciously hosted by PerkinElmer. Both the mini-symposium on speciation/environmental analysis and the Awards symposium (see pages 3-7 for details on the awards symposium) went more smoothly and recordings were made available on the PerkinElmer website. On the other hand, no one registered for the free short courses that Ed Paski was prepared to offer in October. They thus had to be postponed.

The call for nominations that was sent on December 6th only resulted in a single nomination for some of the positions. As you can see on page 1, three Director positions are vacant, as is the Student Representative position on the NEC (congratulations, Alastair, for successfully defending!). Everyone else (except for the Past President who is not elected) is thus acclaimed into their position. I welcome Liyan Xing from PerkinElmer as Vice-President (who will also continue as our Newsletter Editor) and Dominic Larivière from l'Université Laval as the new Secretary. I am grateful to Ahmed Al Hejmi, Kingsley Donkor, Otto Herrmann, Kelly LeBlanc, Ed Paski, and Karen Waldron, for continuing to serve on the NEC, and I thank Taddese Godeto and Eve Kroukamp for their past service as Vice-President and Secretary, respectively.

I hope that the pandemic will soon be under control so that the 64th International Conference on Analytical Sciences and Spectroscopy (ICASS) may go ahead in Kingston in August 2022 (see page 8), as CSASS will not survive without it! Please plan to attend.

With best wishes of health and success in 2022,

Diane Beauchemin

CSASS President

64th ICASS Chair

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*An award symposium was held virtually, hosted by
PerkinElmer on November 10th*

Two awards were announced:

- **2021 Gerhard Herzberg Award**

Winner: Gang Wu

Department of Chemistry, Queen's University, Kingston,
Ontario, Canada K7L 3N6

- **2021 PerkinElmer Spectroscopy Award**

Winner: Patrick Hayes

Département de chimie, Université de Montréal, Montréal,
QC H3C 3J7

2021 Gerhard Herzberg Award Winner



Dr. Gang Wu

Education

Ph.D. in Chemistry (Dalhousie University, 1994)

M.Sc. in Chemistry (York University, 1989)

M.Sc. in Physics (East China Normal University, 1987)

B.Sc. in Physics (Peking University, 1984)

Honors and Awards

2000 Premier's Research Excellence Award

2000 Chancellor's Research Award

1995 NSERC Doctoral Prize and NSERC Postdoctoral Fellowship

Research Experience

2008- Professor

Department of Chemistry, Queen's University, Kingston, Ontario, Canada

2002-2007 Associate Professor of Chemistry (Tenured)

Department of Chemistry, Queen's University, Kingston, Ontario, Canada

1997-2001 Assistant Professor of Chemistry

Department of Chemistry, Queen's University, Kingston, Ontario, Canada

1994-1996 NSERC Postdoctoral Fellow (with R. G. Griffin)

Francis Bitter Magnet Laboratory, Massachusetts Institute of Technology

Abstract for Dr. Wu's Award Presentation on Page 5.

Listening to the Faintest Music from Molecules: ^{17}O NMR Spectroscopic Studies of Organic and Biological Systems

Gang Wu

Department of Chemistry, Queen's University, , Kingston, Ontario, Canada K7L 3N6

Abstract - Over the past seven decades, NMR spectroscopy has revolutionized not only chemical science but also other disciplines such as biological science and medical diagnostics. However, most successful NMR applications to date have relied on detection of atomic nuclei with the smallest non-zero nuclear spin number ($I = 1/2$) (i.e., ^1H , ^{13}C , ^{15}N , and ^{31}P). Any second-year chemistry undergraduate student, after having taken my course on “Organic Spectroscopy”, must have the following question lingering in mind but is afraid of asking: “Why didn’t we learn any NMR about oxygen, while it is among the most abundant elements found in organic and biological molecules?”

Indeed, the oxygen element remains the only one that has not been readily accessible by NMR. So why not? There are two reasons. First, the only NMR-active stable oxygen isotope is ^{17}O , and it is exceedingly hard to find in nature (natural abundance = 0.037%). In comparison, ^1H is everywhere (natural abundance = 99.9%). Second, ^{17}O has an unusual nuclear spin number ($I = 5/2$). Any atomic nucleus with $I > 1/2$ is called a “quadrupolar” nucleus (equivalent to “naughty” in the eyes of NMR spectroscopists). The reason for quadrupolar nuclei to have a “naughty” character is that they often give rise to very broad NMR signals, from which it is rather difficult to extract any useful chemical information.

In this talk, I will describe a personal journey in the past 25 years in pursuing ^{17}O NMR spectroscopy for organic/biological molecules. If we view organic/biological molecules as jigsaw puzzles made out of four kinds of pieces (H , C , N , and O elements), so far chemists are solving molecular puzzles without the capability of “seeing” one quart of the O pieces! The goal of our research is to make these missing O pieces “visible”. Would that make the molecular game a little easier?

2021 PerkinElmer Spectroscopy Award Winner

Dr. Patrick Hayes

Education

Ph.D. Chemistry, Northwestern University, Evanston, IL, USA

B.A. Chemistry, Oberlin College, Oberlin, OH, USA

Honors and Awards

2016 Analyst Emerging Investigator Lectureship, Royal Society of Chemistry

2016 Finlayson-Pitts Visiting Scholar, Trent University

Professional Experience

Associate Professor, Department of Chemistry, Université de Montréal, Montréal, QC, Canada (Summer 2018 –Present)

Assistant Professor, Department of Chemistry, Université de Montréal, Montréal, QC, Canada (Summer 2013 – Spring 2018)

CIRES Postdoctoral Fellow, Department of Chemistry, University of Colorado, Boulder, CO, USA (Spring 2010 – Summer 2013)

**Abstract for Dr. Haye's
Award Presentation on
Page 7.**



Using advanced laser spectroscopies to characterize the optical properties of polymer thin films and atmospheric

Patrick Hayes

Département de chimie, Université de Montréal, Montréal, QC H3C 3J7

Abstract - Sum frequency generation is a powerful vibrational spectroscopy for studying soft-matter interfaces due to its unique surface selectivity that allows the measurement of vibrational spectra of a few molecular layers or even of a monolayer. As an optical technique, it can also probe buried interfaces that are inaccessible for scanning probe techniques such as AFM.

This presentation will discuss how SFG can be used to characterize the structure and conformation of a polymer (polystyrene) in the vicinity of an air and a metal (silver) interface. The results of this work indicate that polymer interfacial conformation depends on molecular weight, and that the properties of polymeric thin films, such as adhesion and wettability, could be tailored by modifying the polymer molecular weight to achieve a desired interfacial conformation.

The second half of the presentation will highlight field measurements carried out in the Canadian High Arctic using photoacoustic spectroscopy to measure the light absorbing properties of atmospheric particles, especially of black carbon (BC). The presence of BC in the atmosphere may accelerate climate change in the Arctic by absorbing solar radiation.

Between 2016 and 2019, the Hayes Group carried out field measurements of BC near Eureka, Nunavut to characterize their climatically important optical properties. The highest concentrations of BC are observed when air pollution is transported to the Canadian Arctic from Eurasia and Alaska.

64th ICASS VENUE CHANGE



The 64th ICASS venue has to change because the Ambassador Hotel was bought by the Hilton chain and will be undergoing renovation at the time of the event. The Sunset dinner cruise of the Thousand Islands on August 8th, and a performance from renowned magician/comedian Dick Joiner during the banquet on August 9th are still confirmed. Negotiations are under way with the three venues in Kingston that would have enough space for 120 participants, based on the number of attendees in 2018 and 2019, when ICASS was held in June, with competition from other conferences.

The Donald Gordon Conference Centre at Queen's University would offer the best deal for attendees staying on site (\$155/night, including hot breakfast) and free parking. However, it can only accommodate 120 attendees and has no room for expansion. It also does not have enough room for the banquet with the magician's show. A separate venue would be required for the banquet, as well as transportation to the cruise ship and the separate banquet venue. Finally, it is not available on 8-10 August 2022: ICASS would have to be held 29-31 August 2022.

The Four Points by Sheraton in downtown Kingston is available on 8-10 August 2022 and has room for expansion, easily accommodating 200 attendees. Parking would be free for attendees. It is only a short walk to the cruise ship. Unfortunately, it would be most expensive for attendees staying on site (\$179/night just for the room). A lower rate was requested.

The Holiday Inn on Kingston Waterfront is available on 8-10 August 2022 and has room for expansion well beyond 120 attendees. It would be cheapest for people staying on site (\$149/night) and the shortest walk to the cruise ship. However, there would be a parking fee of \$12/day (normally \$24/day). Talks are under way to try to eliminate this fee, as it would then be the best venue, with breathtaking view of Lake Ontario.

Stay tuned for the results of negotiations!

See <http://www.csass.org/ICASS.html> for details