ACS of Western New York

Double Bond

The Newsletter of the Western New York Section of the American Chemical Society

Volume 92 ***February 2020***

NOMINATIONS SOUGHT FOR TEACHER OF THE YEAR

The Education Committee of the Western New York section of the American Chemical Society (WNYACS) is accepting nominations for the **Outstanding High School Science Teacher of the Year Award**. On behalf of the WNYACS Education Committee, we request you to nominate a high school science teacher(s) for this year's award, or to refer our letter to a school principal or award or nominating committee.

Nominations are due by Friday, **March 6, 2020**. For nomination details, see the Awards page of the WNYACS website:

wnyacs.org/awards

Sincerely,

Rachel Ventura and Dominic Ventura
Education Committee Co-Chairs

UNDERGRADUATE RESEARCH SYMPOSIUM

April 25th, 2020

Save the Date!

The 13th annual **Undergraduate Research Symposium**, sponsored by the Western New York ACS section, will be held at SUNY Buffalo Sate College on Saturday, April 25th, 2020.

Undergraduate student talks and posters are welcomed and there will be awards presented for outstanding presentations.

The keynote speaker this year will be Dr. Mary Kay Pflum from the Department of Chemistry at Wayne State University.

More information can be found on the symposium website:

wnyacs.org/undergraduate-research-symposium

FEBRUARY MEETING
February 25, 2020

Come to the first meeting of the new decade!

The Future of Food

How will chemists change the way we eat?

When: Tuesday, February 25th starting at 6:30 p.m.
Where: UB North Campus; **Norton Hall, room 112**
RSVP: forms.gle/eohTPr3LC6MCvY2A7
Where: Daemen College, **Schenck Hall, room 107**
Contact Caitlyn: cmontros@daemen.edu
Cost: FREE!

Refreshments, prizes and live broadcast from ACS National

*** *please see page 4 for more details* ***

CHEMISTRY GRADUATE STUDENT SYMPOSIUM

Abstract submission is now underway for the 38th annual Chemistry Graduate Student Symposium hosted on campus at the University at Buffalo, *May 20th – 22nd, 2020*. Abstract submission will remain open until *May 1st, 2020* and registration is free of charge.

Abstract submission and registration information can be found on our website at www.ubchemgss.org

*** *please see page 3 for more details* ***

NOMINATIONS FOR THE 2020 SCHOELLKOPF MEDAL

Please consider nominating a colleague for the Jacob F. Schoellkopf Medal--the oldest continuously presented ACS section award in the country.

Information is available on the Schoellkopf nomination web page: wnyacs.org/schoellk-nomination/

Nominations are due by **May 1, 2020**

Dr. Christopher J. Patridge, Secretary

WNYACS LOCAL HIGHLIGHTS

Unifrax: A Global Company with Local Roots

Christine LaPorte

Unifrax's roots in the Western New York area run deep, starting about 75 years ago at what was then the Carborundum Company. When the parent company fragmented in 1996 to focus on abrasives, Unifrax became independent, specializing in manufacturing ceramic fiber products.

With their invention of Fiberfrax,® the company pioneered the development and use of high temperature ceramic fibers--inorganic minerals such as silica and alumina that are drawn into thin fiber threads.

Unifrax headquarters located in Tonawanda, NY (Photo courtesy of Unifrax©)

As with many material discoveries, this whole industry started with a serendipitous accident. In 1942, John 'Charlie' McMullen was a scientist working in Carborundum's research and development division. He

Charlie McMullen, inventor of Fiberfrax, stands next to his invention. (Photo courtesy of Unifrax©)

was trying to make hollow ceramic spheres by subjecting molten bauxite to pressurized air. He found that rather than hollow spheres, the mixture turned into a cotton-like material. They found the fibers had excellent insulating properties, even at high temperatures, and were lightweight. Due to these properties, Ceramic fiber materials can be found in applications such as steelmaking equipment, fire protection, and emission control devices. allowing Unifrax to grow, now employing roughly 2,300 employees worldwide. Their materials are found in industries such as metal working, power generation, automotive, and aerospace.

Ceramic fibers can be transformed into ropes, mats, felted paper, and even foams. (Photo courtesy of Unifrax©)

In the last 20 years, industry and regulation have called for products with low bio-persistent fibers. Low bio-persistent fibers are broken down more readily by the human body. Unifrax recently developed two new products that meet such standards: Insulfrax® LTX™ and Isofrax® 1400. Insulfrax® technology uses a calcia-magnesia-silica chemistry, and is suitable for temperatures up to 1200°C. Insulfrax® LTX blankets are processed to reduce the amount of non-fiberized particles (also known as shot) for lighter, more efficient insulation. Isofrax® 1400 is a magnesia-silica blend that can operate up to 1300°C, one of the highest operating limits among low bio-persistent fibers for insulation.

WNYACS 2020 LOCAL SECTION OFFICERS

Thank you and congratulations to those who have been elected to serve on the WNYACS Executive board for 2020: Contact information for officers and committee chairs is found on page 6, and is available on the section website: **wnyacs.org**

Chair	(2020)	Ekin Atilla
Chair-Elect	(2020)	Luis Velarde
Vice-Chair	(2020)	Dominic Ventura
Treasurer	(2020-2021)	Robert Stewart
Councilor	(2020-2022)	Peter Schaber
Members at Large	(2020-2021)	Lindsay Rose
		Haridasan Nair

University at Buffalo
The State University of New York

38th Annual
Chemistry Graduate Student Symposium

Symposium Dates:
May 20th – 22nd, 2020

Abstract Submission Deadline:
May 1st, 2020
No Late-breaking Abstracts!

Location: Knox Hall,
UB North Campus

Formats Accepted:
Poster and Oral Presentations

Website:
www.ubchemgss.org

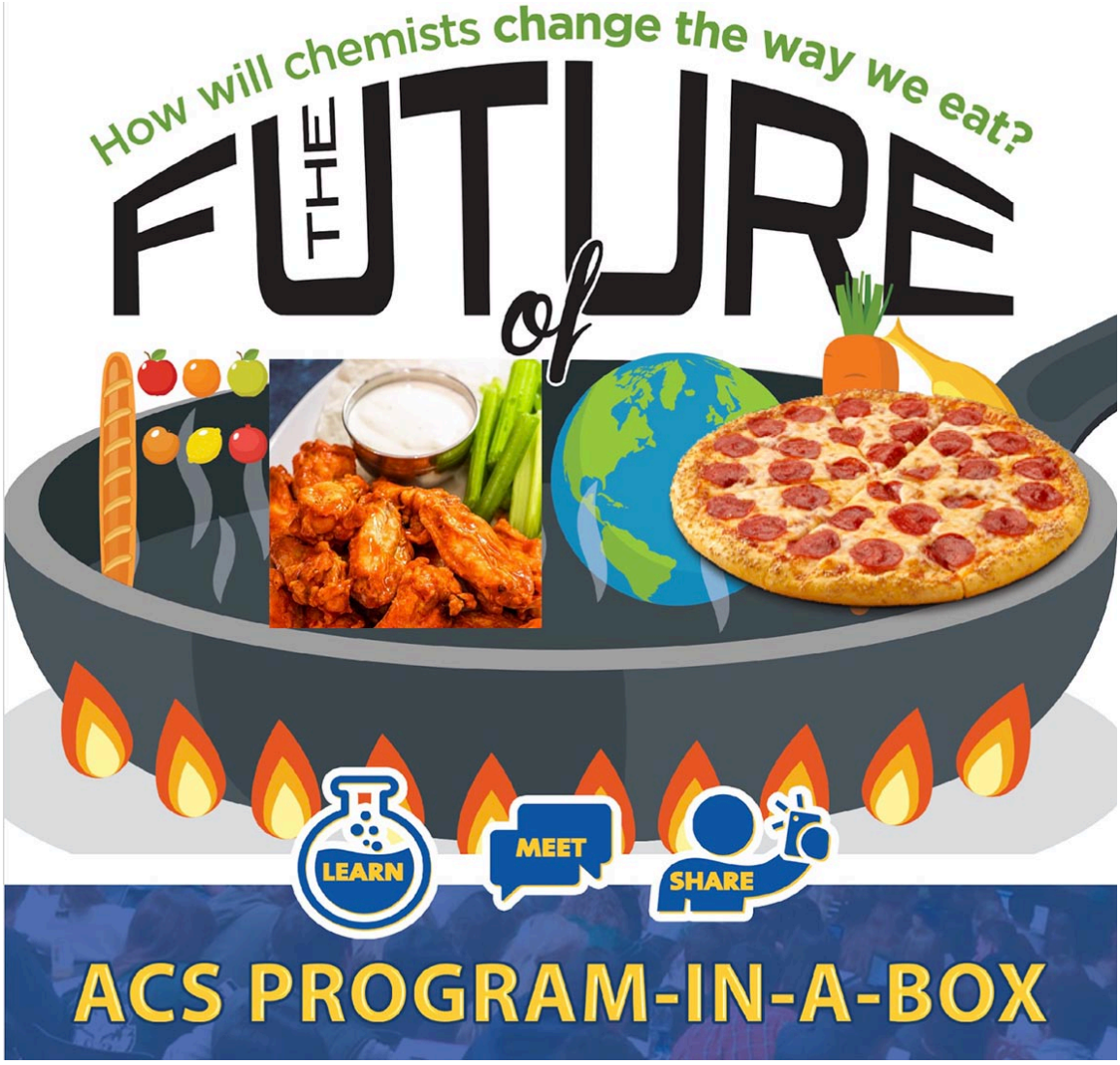
E-mail:
chemistrybuffalogss@gmail.com

Featuring Keynote Lectures from Leading Scientists

Dr. Igor K. Lednev
University at Albany

Dr. Daniel Weix
University of Wisconsin-Madison

Dr. Ryan O'Donnell
Army Research Laboratory



Two Locations!

University at Buffalo, North Campus:

Tuesday Feb. 25 **RSVP at:** **https://forms.gle/eohTPr3LC6MCvY2A7**
6:30 pm for food--goes live at 6:45 from ACS National
Norton Hall, Room 112

Daemen College:

Tuesday Feb. 25 **Questions/RSVP?** **Contact Caitlyn Montross:**
6:45 pm--goes live from ACS National Email: **cmontros@daemen.edu**
Schenck Hall, Room 107

80 YEARS AGO IN THE DOUBLE BOND

The following appeared in the February, 1940 edition of the Double Bond

Future Sources of Power

At the January meeting of the WNY Section of the American Chemical Society, held January 16th at Hotel Niagara in Niagara Falls, C. C. Furnas, professor of chemical engineering at Yale University discussed the problem of securing new sources of energy to replace coal and petroleum.

Although there is no shortage of petroleum at present, Americans are not discovering as much as they are consuming each year according to Prof. Furnas and they will face a shortage within a generation unless large new fields are discovered. While many new pools will doubtless be developed, the possible areas for such pools have been explored rather thoroughly and it appears very unlikely that there is much undiscovered oil underneath the United States.

Coal can be made into a liquid fuel but this is not a cheap process. The processes for liquefaction of coal that are used abroad are operating under a heavy government subsidy which amounts in Great Britain to 18 cents a gallon.

As far as the coal supply itself is concerned Dr. Furnas stated that the United States, with over 50% of the world's supply, and North America with 70%, need not worry for at least 3,000 years. All the coal available is not of good quality and research on the utilization of low grade coal will have to be done within several hundred years.

Water power can never furnish more than a small part of our energy requirements according to Dr. Furnas. At the present time we are utilizing half our potential water power yet it furnishes only 5% of our energy. Wind power is too uncertain and therefore does not merit much consideration as a future source of power.

Although atomic disintegration has received much attention, especially in the Sunday Supplements it does not appear very probable at the present time that energy of a sufficiently high potential to be economically desirable can be extracted by disintegrating atoms. If we had available the temperatures and pressures prevailing in the sun perhaps we could secure our necessary energy from this source.

The only known source of energy remaining is the sun. Capturing the sun's energy by means of photocells does not appear very promising as all the present types have extremely low efficiencies. All the solar boilers that have been developed are cumbersome and inefficient. So we are faced with the problem of capturing the ample but elusive energy in solar radiation.

Dr. Furnas suggested that the solution to the problem lies in man doing efficiently what nature has been doing inefficiently for a billion years utilizing photochemical reactions.

"What we should like to do," he declared, "would be to take some simple compound such as formaldehyde, formed with the help of radiant energy, put it in an electrochemical cell, expose it to oxygen and then reverse the reaction and get back the stored energy as electrical energy at high efficiency. Formaldehyde can be oxidized in a cell in a basic solution to give formic acid and a small amount of electrical energy.

"The catalyst which nature uses for performing the photosynthesis of the above reaction is chlorophyll. That's the best catalyst known but it's very poor. Plants are very inefficient storers of energy. Even the most luxuriant plants have an energy storage efficiency of less than 2%. We ought to be able to do a lot better than that.

"It's a wide open field, this study of photosynthesis and the study of oxidation cells which will reverse the reaction. That's the reason it's hopeful. The systems which might be used would not have to be limited to organic compounds. It may well be that inorganic compounds offer the most hope. The satisfactory system would need to be one that is as light sensitive as the chemicals on a photographic film, and as easily reversible as lead storage batteries. If such a photochemical electrical system can be developed, the problem of energy capture and storage would be solved. The storage of the energy would be simply that of storing chemical compounds.

"Someday the photochemical approach to energy utilization will either be solved or definitely proved impractical. In view of our own energy resources, it may seem foolish to start working on it now. But it may not be too early to start. If we wait too long we may be caught short as energy supplies dwindle. Moreover, many parts of the world already suffer from insufficient energy. Many international problems might disappear if every group of people could utilize fully the energy falling on its roof tops.

"Enough energy falls on about 100 square miles of an arid, desert region to supply the United States. When we become able to utilize efficiently this energy treasure wherever it may fall, we may solve many of our economic problems."

C. C. Furnas later became Chancellor of the University of Buffalo, then President of the University at Buffalo, SUNY. On the UB North Campus, Furnas Hall bears his name, and is the home of several departments within the School of Engineering and Applied Sciences.

--Ed.