

The Chemical Bulletin

<http://chicagoacs.org>

JANUARY • 2017

CHICAGO SECTION AMERICAN CHEMICAL SOCIETY JOINT MEETING WITH THE AMERICAN INSTITUTE OF CHEMICAL ENGINEERS FRIDAY, JANUARY 20, 2017

Roosevelt University
1400 N. Roosevelt Rd
Schaumburg, IL 60173

Also Being Streamed to Satellite Locations:

North Central College
Harold & Eva White Activity Center
Centennial Hall (2nd. Floor)
325 East Benton Avenue
Naperville, IL 60540

University of Illinois – Chicago
Science & Engineering South Building
Lecture Room 138
845 West Taylor Street
Chicago, Illinois 60607

DIRECTIONS TO ROOSEVELT UNIVERSITY IN SCHAUMBURG

From I-355 North/South:

Take I-355 north and merge onto I-290 W. Take exit 1B for IL-72/Higgins Rd, toward Woodfield Rd/IL-58/Golf Rd. Continue onto E Frontage Rd and turn left onto Golf Rd. Make a slight right onto McConnor Pkwy and turn left onto N Roosevelt Blvd.

From I-290 East/West:

Take I-290 west to exit 1B for IL-72/Higgins Rd, toward Woodfield Rd/IL-58/Golf Rd. Continue onto E Frontage Rd and turn left onto Golf Rd. Make a slight right onto McConnor Pkwy and turn left onto N Roosevelt Blvd.

From I-90/I-94 East/West:

Take I-90/I-94 (Kennedy Expy) west toward O'Hare-Rockford. Keep left to take I-90 W/ Jane Addams Memorial Tollway W toward Rockford/I-294 N/Milwaukee. Exit Arlington Hts. Rd. South and turn left onto W Algonquin Rd./ IL-62. Turn slight left onto W Golf Rd/IL-58. Make a slight right onto McConnor Pkwy and turn left onto N Roosevelt Blvd.

From I-294 North/South:

Take I-294 in either direction to I-290 W. Take exit 1B for IL-72/Higgins Rd, toward Woodfield Rd/IL-58/Golf Rd. Continue onto E Frontage Rd and turn left onto Golf Rd. Make a slight right onto McConnor Pkwy and turn left onto N Roosevelt Blvd.

Parking: Free



Dr. John Rogers

Louis Simpson and Kimberly Querrey
Professor of Materials Science and
Engineering, Biomedical Engineering
and Neurological Surgery. "Materials
for Biodegradable Electronics"

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REGISTRATION, POSTER SESSION & NETWORKING	5:30 PM – 6:30 PM
DINNER	6:30 PM – 7:30 PM
INTRODUCTORY REMARKS BY FRAN KRAVITZ, CHICAGO SECTION CHAIR	7:30 PM – 7:40 PM
LECTURE BY PROFESSOR JOHN ROGERS	7:40 PM – 8:40 PM

MENU

Choice of:

Panera Turkey Sandwich Box Lunch (Oven roasted turkey raised without antibiotics, lettuce, vine-ripened tomatoes, red onions, pure mayo, spicy mustard, salt and pepper on whole grain. Served with potato chips, pickle and a cookie.)

OR

Panera Mediterranean Veggie Boxed Lunch (Zesty sweet Peppadew piquant peppers, feta cheese, cucumbers, lettuce, vine-ripened tomatoes, red onions and cilantro-jalapeno hummus with salt and pepper on thin sliced Tomato Basil. Served with potato chips, pickle and a cookie.)

The cost is \$15 to Section members who have paid their local section dues, members' families, and visiting ACS members. The cost to members who have NOT paid their local section dues and to non-members is \$17.

Dinner reservations are required and should be received in the Section Office via phone (847-391-9091), email (chicagoacs@ameritech.net) or website (<http://chicagoacs.org/meetinginfo.php?id=114&ts=1479155469>) by noon on Wednesday, December 7. PLEASE HONOR YOUR RESERVATIONS. The Section must pay for all dinner orders. No-shows will be billed.

Biography:

Professor **John A. Rogers** obtained BA and BS degrees in chemistry and in physics from the University of Texas, Austin, in 1989. From MIT, he received SM degrees in physics and in chemistry in 1992 and the PhD degree in physical chemistry in 1995. From 1995 to 1997, Rogers was a Junior Fellow in the Harvard University Society of Fellows. He joined Bell Laboratories as a Member of Technical Staff in the Condensed Matter Physics Research Department in 1997, and served as Director of this department from the end of 2000 to 2002. He then spent thirteen years on the faculty at University of Illinois, most recently as the Swanlund Chair Professor and Director of the Seitz Materials Research Laboratory. In Sept 2016, he joined Northwestern University as the Louis Simpson and Kimberly Querrey Professor of Materials Science and Engineering, Biomedical Engineering, Mechanical Engineering, Electrical Engineering and Computer Science, Chemistry and Neurological Surgery, where he is also the founding Director of the newly endowed Center on Bio-Integrated Electronics. His research has been recognized by many awards including the Baekeland Award (ACS, 2007), a MacArthur Fellowship (2009), the Lemelson-MIT Prize (2011), the

Smithsonian Award for American Ingenuity in the Physical Sciences (2013), and the Society of Engineering Science Eringen Medal (2014). He is a member of the National Academy of Engineering, the National Academy of Sciences and the American Academy of Arts and Sciences.

Abstract:

A remarkable feature of modern integrated circuit technology is its ability to operate in a stable fashion, with almost perfect reliability and without physical or chemical change. Recently developed classes of electronic materials create an opportunity to engineer the opposite outcome, in the form of devices that can dissolve in water to yield completely benign end products. The enabled applications include zero-impact environmental monitors, 'green' consumer electronics and bio-resorbable biomedical implants - none of which can be achieved with technologies that exist today. This presentation describes foundational concepts in chemistry, materials science and assembly processes for bioresorbable electronics, in 1D, 2D and 3D architectures, the latter enabled by approaches that draw inspiration from the ancient arts of kirigami and origami. Wireless sensors of intracranial temperature, pressure and electrophysiology designed for use in treatment of traumatic brain injury provide application examples.

DIRECTIONS TO NORTH CENTRAL COLLEGE:

Train:

Amtrak/Metra Commuter Rail

Burlington Northern Line travels from Chicago's Union Station to Naperville's Train Station, which is just two blocks northwest of campus.

From the West:

Follow I-88 east to Winfield Road. Exit onto Winfield Rd. and turn left (south) at the end of the exit. Take Winfield Rd. and make a left (east) onto Diehl Rd. Continue on Diehl Rd. and make a right (south) onto Washington St. Continue on Washington St. and make a left (east) onto Benton.

From the South:

Follow I-55 to I-355 north to Maple Ave. exit. Turn left (west) on Maple and continue until the street name changes to Chicago Ave. Take Chicago Ave. to Brainard St and turn right (north). Take Brainard St. and make a left onto Benton.

From the North:

Follow I-294 south to I-88 west. Follow I-88 east to Winfield Road. Exit onto Winfield Rd. and turn left (south) at the end of the exit. Take Winfield Rd. and make a left (east) onto Diehl Rd. Continue on Diehl Rd. and make a right (south) onto Washington St. Continue on Washington St. and make a left (east) onto Benton.

From Chicago or the East:

Follow I-290 expressway west to I-88 west. Follow I-88 east to Winfield Road. Exit onto Winfield Rd. and turn left (south) at the end of the exit. Take Winfield Rd. and make a left (east) onto Diehl Rd. Continue on Diehl Rd. and make a right (south) onto Washington St. Continue on Washington St. and make a left (east) onto Benton.

Parking: on the street is free

DIRECTIONS TO UNIVERSITY OF ILLINOIS AT CHICAGO:

Public Transportation: Both **CTA buses** and the **CTA trains** (the "L") run through and around campus. Seven CTA bus routes run through the campus ([see routes as a layer on our campus map](#)). The Blue Line train (UIC-Halsted, Racine and Illinois Medical District stops) and the Pink Line train (Polk stop),

From I-90/I-94 East/West: Take I-90 east toward Kennedy Expy/Chicago and exit onto the Taylor St Exit 52A toward Roosevelt Rd. Continue straight to go onto S Union Ave. and turn right onto W

(continued on page 3)

Roosevelt Rd. Take that to S Morgan St. and turn right. Continue to W Taylor St. and make a right.

From I-294 North: Take I-294 and merge onto I-90 toward Kennedy Expy/Chicago and exit onto the Taylor St Exit 52A toward Roosevelt Rd. Continue straight to go onto S Union Ave. and turn right onto W Roosevelt Rd. Take that to S Morgan St. and turn right. Continue to W Taylor St. and make a right.

From I-88 East/West: Take I-88 east to I-290 toward Chicago. Take Exit 29A toward Racine Ave. Merge onto W Congress Pkwy and make a right onto S Racine Ave. Turn left onto W Taylor St.

Parking: Halsted/Taylor Parking Structure, 760 West Taylor. Enter on Taylor St., just east of Halstead (Cost: \$8.75)

The mission of the Chicago Section of the ACS is to encourage the advancement of chemical sciences and their practitioners.

LETTER FROM THE PAST CHAIR

Dear Chicago ACS Members,

It's been a pleasure to serve as Chair of the Chicago Section this past year. Networking within and outside our Section has reminded me yet again of the expertise and excellence of our members. I hope all of you will continue to use ACS to build your networks and discover new passions and opportunities – to enhance our Section's outreach and impact, involve new chemists and fresh ideas, obtain challenging and satisfying jobs, make valuable contributions after retirement, or to just plain enjoy meeting chemists and learning more chemistry.

I owe a great deal of thanks to the many experienced Board Members and Committee chairs and to our Section Office Manager, Gail Wilkening, who were so generous in providing me with advice and assistance throughout the year. It is indeed laudable that so many of our Section members give their time and energy at the local and national level to further the ACS mission "to advance the broader chemistry enterprise and its practitioners."

I wish you a happy and prosperous 2017. You will be in good hands with your new Chair, Fran Kravitz.

MARY JO BOLDINGH, MS, JD

2016 Chair, Chicago ACS

TRY
COLOR
IN YOUR AD

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LETTER FROM CURRENT CHAIR WE CAN'T DO THIS WITHOUT YOU

Welcome to 2017, a new year for the Chicago Section with new technology. We will be streaming monthly program meetings from one meeting location to two additional sites in 2017. The Chicago Section covers a wide geographical area, creating commuting difficulties for many of you to attend our monthly program meetings during rush hour. We heard you and now we plan on addressing this issue with new technology. Our Section recently received an IPG (Innovative Project Grant) from the ACS Local Section Activities Committee to help us adapt to your needs as members. Our Section strives to bring in high quality presenters with presentations on current topics and cutting-edge technologies. Streaming our monthly program meetings to two additional sites will allow you to participate in these meetings. You will be able to ask questions of the presenter from these remote locations. In the initial phase of this project, we will target: 1) increasing members' attendance that do not attend monthly meetings due to distance and traffic issues; 2) increasing student participation at remote academic sites with limited incomes and transportation barriers and 3) attracting a more diverse audience including students, senior chemists and academic/industrial/ government chemists with lower meal costs. All meetings next year, except for the Willard Gibbs Award dinner will be held at a university location.

I would be amiss if I did not thank Mary Jo Boldingh, our 2016 Chair for her leadership in guiding our Section down the path of success. Also, thank you to all of the 2016 committee chairs, volunteers and especially, our office manager Gail Wilkening for all of their hard work.

We can't do this without you, our members and future members. We need your help in making this a successful and an award winning year. Please participate in Chicago Section activities like the monthly meetings, community outreach and on committees. Bring a friend to a meeting. The heart of every Section is its members. We will have posters of our committees at our January meeting. Please make this an outstanding year by signing up to help on a committee. Committees meet by conference call to plan their events. I have listed the names of 2017 Board and Committee Chairs for your convenience in another article. **CAN WE COUNT ON YOU?**

Fran Kravitz
2017 Chicago Section ACS Chair

A HOLIDAY THANK YOU

The Chicago Section of the American Chemical Society would like to thank members who participated in the 2016 December dinner meeting food and toy drive.

Your generosity provided several bags of toys and 262 pounds of food and \$370 in checks donations. The food and money was donated to the local Loaves & Fishes Community Pantry which is a community based, non-profit organization established to provide food and personal care essentials to residents in need. This year the toys were donated to the Adoption Center of Illinois at Family Resource Center in Chicago, an adoption agency providing services for couples seeking to adopt children in the US or overseas. This agency also provides services for birth parents and foster children. The toys were used for birth mothers who have placed children for adoption or who are considering a placement and are often raising other children. The toys provide joy to children whose birth parents are struggling and do not have extra money for the holidays.

FRAN KRAVITZ

"CHEM SHORTS" For Kids

WINDOWS ON A SODA-POP CAN

Have you ever seen a can crushed? How about one that has been ripped apart? Crushing an aluminum can may not take that much strength but ripping one apart would be very difficult to do. That is unless you've had a little chemical help.

Materials:

Copper Sulfate (can be found as root killers at many stores) or copper(II) chloride
Salt (not necessary if you have copper(II) chloride)
Aluminum can
Glass or plastic container that will hold the soda-pop can
Sandpaper

Have an adult partner help you with the handling of all chemicals!

Using the sandpaper, remove two squares of paint about the size of the UPC symbol (I have used a Dremel tool to remove the paint much more quickly) – **see picture A**. Do this on opposite sides of the can. The paint protects the aluminum underneath it so that the aluminum does not easily react with other things. The bottom of the can does not have paint and will be eaten away by the copper solution so you may want to put some plastic wrap around the bottom secured with a rubber band. Fill the can with water and place it inside the glass or plastic container. Pour some copper sulfate into the glass or plastic container on the outside of the pop can – **see picture B**. Normally this reaction happens much faster if you use copper chloride but if that is not readily available you can simply add some salt to the copper sulfate. In a short period of time you will begin to see the blue translucent solution turn murky and some brownish red solid begin to appear. You will also see some gas evolved. After about 30 minutes you can remove the can from the container and you will notice a thin film holding the water inside the can – **see picture C**. Be careful with how you handle the can because the plastic liner is easily broken.

What's happening?

It turns out that aluminum is really quite reactive and so to protect the can from other things we put paint on the outside of the can and a plastic liner to protect the inside of the can. It is believed that the chloride from the salt is necessary to start etching away at the oxide pits on the surface of the metal. Once the pure aluminum is exposed, the copper ions will oxidize the aluminum metal to colorless aluminum ions while the blue copper ions get reduced to brownish red copper metal. The aluminum ions are washed away into the solution leaving nothing behind but the plastic liner.

To set up the can to be able to rip it in half, this can be done in two ways. You can score the can on the outside so that you take away the paint. However, this will deface the can on the outside and you will notice that something is amiss with the can. On the other hand you can score the can on the inside so that you remove a thin line of the plastic liner on the inside of the can and when the aluminum is eaten away by the copper ions, it will leave only the paint holding the two halves of the can together.

Waste:

If there is any blue remaining in the solution, add some aluminum foil until the blue disappears. The metal can and the solid copper can be thrown into the trash can. The colorless solution can go down the drain with lots of water.

To see how you can set up a can to rip it apart, see the following video.

<https://www.youtube.com/watch?v=BK0x5v0Kb7A>

References:

This experiment is referred to in the October 1993 ChemShorts article of the Bulletin

<http://chicagoacs.net/archive/ChmShort/CS93.html#10.93>

To view all past "ChemShorts for Kids," go to: http://chicagoacs.org/articles.php?article_category=1

Paul Brandt



A



B



C

2017 Board and Committee Chairs

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Historian

Hospitality

House

Illinois State Fair

Long Range Planning

Membership

Minority Affairs

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Policy

Pre-Dinner Speakers

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Program Committee

Project SEED

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Stieglitz

Trustees

Women Chemists

Younger Chemists

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Richard Cornell

TBD

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NORA LIU (1924-2016)

It has come to our recent attention that a former colleague of the section passed away this last year. **Nora Liu** died peacefully in her sleep on February 27, 2016, in Woburn, MA. She was born on August 9, 1924 in Budapest, Hungary. She emigrated to Australia in 1948 and earned her Doctorate in Chemistry from the University of Sydney and came to the University of Illinois as a Fullbright Scholar. She began a business in technical translations, which she ran for 50 years until her death. She was an active member in the Section through the 70's and 80's serving in many capacities (Public Affairs and Women's Program).

Partially published in Chicago Suburban Daily Herald on April 3, 2016.

CALENDAR

January 20: Chicago Section Joint Meeting with the engineers in AIChE-Chicago. **See details in this issue.**

January 24: January 24: The Annual IIT Bridge Competition at IIT's Main Campus (Herman Hall). You can find information on the Bridge Competition at <http://bridgecontest.phys.iit.edu/public/chicago/index>

February 12: Family Open House at the Lederman Science Center from 1-5 pm. Children must be accompanied by an adult (There's plenty for the grown-ups too). Most appropriate for children in grades 3 and up. <http://ed.fnal.gov/events/openhouse/>

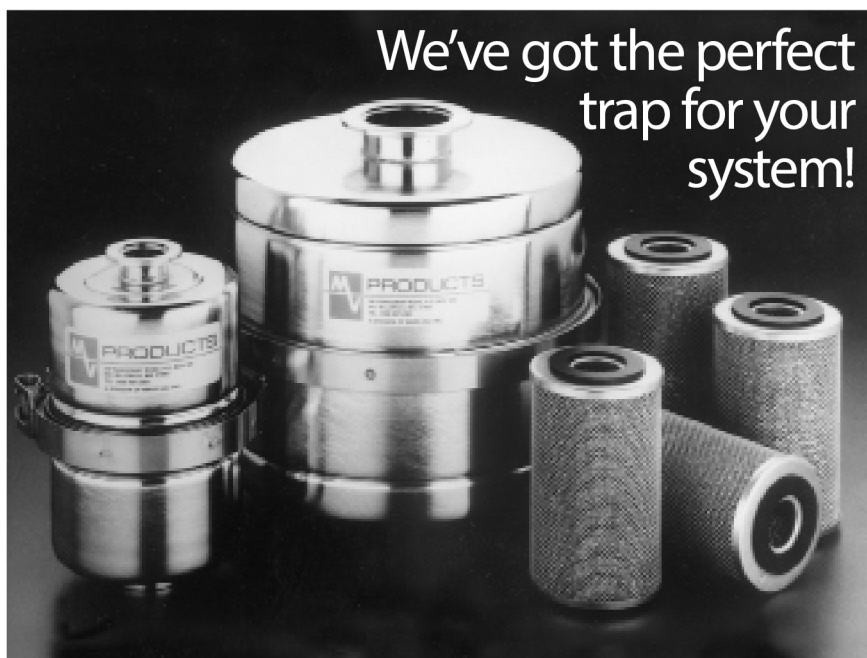
February 27: 33rd Annual Engineers Week Expo at the Illinois Institute of Technology - Rice Campus at 201 East Loop Drive, Wheaton (10:30 – 3:30) "Engineering New Horizons." <http://appliedtech.iit.edu/engineersweek>

March 5-9: Pittcon 2017 will be in Chicago, IL. <http://pittcon.org/>

March 30 – April 2: NSTA's National Conference "Sun, Surf & Science", Los Angeles, CA. <http://www.nsta.org/conferences/national.aspx>

April 2 -6: 253rd American Chemical Society National Meeting and Exposition "Advanced Materials, Technologies, Systems & Processes", San Francisco, CA. <https://www.acs.org/content/acs/en/meetings/spring-2017.html>

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