

BREA NEWS

www.bnl.gov/bera/activities/brea/

Volume 19, Issue 1

January/February 2019

BREA Meetings

BREA meetings are held on the second Tuesday of every month (except for August), at 1 p.m. in one of the conference rooms in Bldg. 400 (except where noted).

All BREA members are invited to attend and participate.

Meeting Schedule

January 8, 2019

February 12, 2019

March 12, 2019

BREA Officers

President

Steve Shapiro
shapiro@bnl.gov

Vice President

Bob Kinsey
bobkin@optonline.net

Secretary

Arnold Moodenbaugh
moodenba@optonline.net

Treasurer

Lillian Kouchinsky
lkouchin@yahoo.com

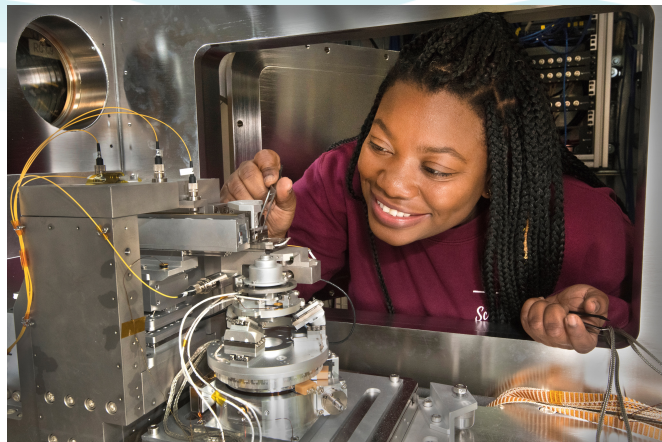
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Newsletter Editor

Mona S. Rowe
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*NSLS-II scientist
Tiffany Victor at
the HXN beam-
line. See article on
page 2.*

*— photo by Roger
Stoutenburgh*



From the President

by Steve Shapiro, shapiro@bnl.gov

Dear Fellow BREA Members,

I would like to wish all of you a Very Happy New Year 2019. I look forward to seeing many of you at our monthly meetings – the 2nd Tuesday of each month – and greeting you at our annual luncheon in June.

I want to call your attention to the plans for Discovery Park at BNL that are moving along with some funding for this year. It is a key element in the Brookhaven Lab Campus Development and Master Plan and is envisioned as a joint land-use partnership with New York State and Long Island local government, not-for-profit entities, and private industry.

Discovery Park will be located largely in the old apartment area, which can easily be configured to be outside the Lab's security perimeter. It will consist of a federal science and support center, housing for users of BNL facilities, user amenities and an education outreach center meant to inspire students, teacher, and the local community.

(continued on page 4)

BNL Scientists Produce 3-D Chemical Maps of Single Bacteria

Scientists at the National Synchrotron Light Source II (NSLS-II) have used ultrabright x-rays to image single bacteria with higher spatial resolution than ever before. Their work, published in *Scientific Reports*, demonstrates an x-ray imaging technique, called x-ray fluorescence microscopy (XRF), as an effective approach to produce 3-D images of small biological samples.

“For the very first time, we used nanoscale XRF to image bacteria down to the resolution of a cell membrane,” said Lisa Miller, a scientist at NSLS-II and a co-author of the paper. “Imaging cells at the level of the membrane is critical for understanding the cell’s role in various diseases and developing advanced medical treatments.”

The record-breaking resolution of the x-ray images was made possible by the advanced capabilities of the Hard X-ray Nanoprobe (HXN) beamline, an experimental station at NSLS-II with novel nanofocusing optics and exceptional stability. “HXN is the first XRF beamline to generate a 3-D image with this kind of resolution,” Miller said.

While other imaging techniques, such as electron microscopy, can image the structure of a cell membrane with very high resolution, these techniques are unable to provide chemical information on the cell. At HXN, the researchers could produce 3-D chemical maps of their samples, identifying where trace elements are found throughout the cell.

“At HXN, we take an image of a sample at one angle, rotate the sample to the next angle, take another image, and so on,” said Tiffany Victor, lead author of the study and a scientist at NSLS-II. “Each image shows the chemical profile of the sample at that orientation. Then, we can merge those profiles together to create a 3-D image.” Miller added, “Obtaining an XRF 3-D image is like comparing a regular x-ray you can get at the doctor’s office to a CT scan.”

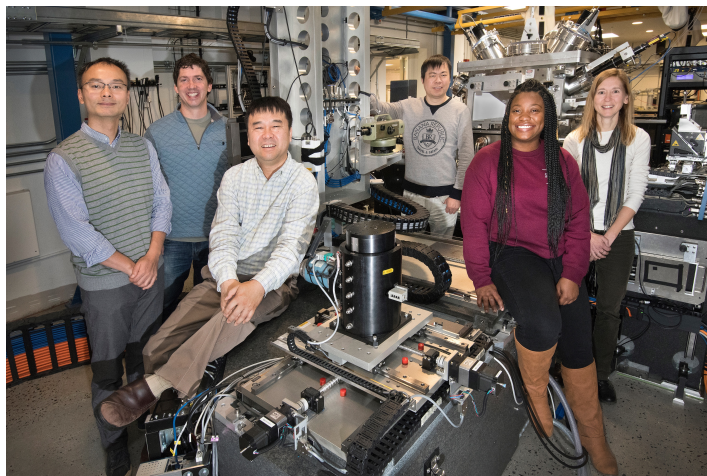
The images produced by HXN revealed that two trace elements, calcium and zinc, had unique spatial distributions in the bacterial cell. “We believe the zinc is associated with the ribosomes in the bacteria,” Victor said. “Bacteria don’t have a lot of cellular organelles, unlike a eukaryotic (complex) cell that has mitochondria, a nucleus, and many other organelles. So, it’s not the most exciting sample to image, but it’s a nice model system that demonstrates the imaging technique superbly.”

The researchers say that demonstrating the efficacy of the x-ray imaging technique, as well as the sample preparation method, was the first step in a larger project to image trace elements in other biological cells at the nanoscale. The team is particularly interested in copper’s role in neuron death in Alzheimer’s disease.

“Trace elements like iron, copper, and zinc are nutritionally essential, but they can also play a role in disease,” Miller said. “We’re seeking to understand the subcellular location and function of metal-containing proteins in the disease process to help develop effective therapies.”

– Stephanie Kossman, skossman@bnl.gov

Editor’s note: In 2017, BREA News carried a feature on Tiffany Victor, then a member of BNL’s Association for Students and Postdocs (ASAP) and a Ph.D. student at Stony Brook University. BREA has supported ASAP by paying for refreshments at various events. In the last issue of BREA News, President Steve Shapiro reported on his attendance at the ASAP Early Career Research Symposium in October 2018. This event showcases the research performed by students and postdocs at BNL. “I was heartened to see the enthusiasm, excitement and vitality of these young scientists,” said Shapiro. “If some of them can remain at the Lab, the future is in good hands.” Victor received her Ph.D. in Chemistry in 2018 and is now a Director’s Postdoc at NSLS-II.



The research team at NSLS-II’s Hard X-ray Nanoprobe. Pictured from left to right are Xiaojing Huang, Randy Smith, Yong Chu, Hanfei Yan, Tiffany Victor, and Lisa

Beware of Scams!

This is your last chance to pick up your Walmart gift.

Grandma, I'm in jail. I need you to send me money for bail.

This is to notify you that you have won the Canada-Uk National Lottery.

To view your e-card, you will need to download the updated version of Flash Player.

This call is officially a final notice from the I.R.S., Internal Revenue Service. The reason of this call is to inform you that I.R.S. is filing a lawsuit against you.

Above are examples of scams, including the email to the right that supposedly came from BREA Treasurer Lillian Kouchinsky to BREA News Editor Mona Rowe.

Even BREA President Steve Shapiro has personal experience: "I got an email from what I thought was Apple for a purchase I didn't make. I clicked on 'cancel and manage subscription' and it brought me to an authentic-looking Apple website. It asked me questions, like name and address and credit card number. I stopped when it asked me to upload a photograph of my driver's license and credit card. I

immediately called Apple, and they confirmed it was a fraud. Sure enough, a few days later my credit card was charged for something I didn't order. The bank caught the false charge and blocked my card."

Shapiro was lucky. "But I feel stupid for being taken in," he said.

Beware of scams. This is a short list of common scams and frauds:

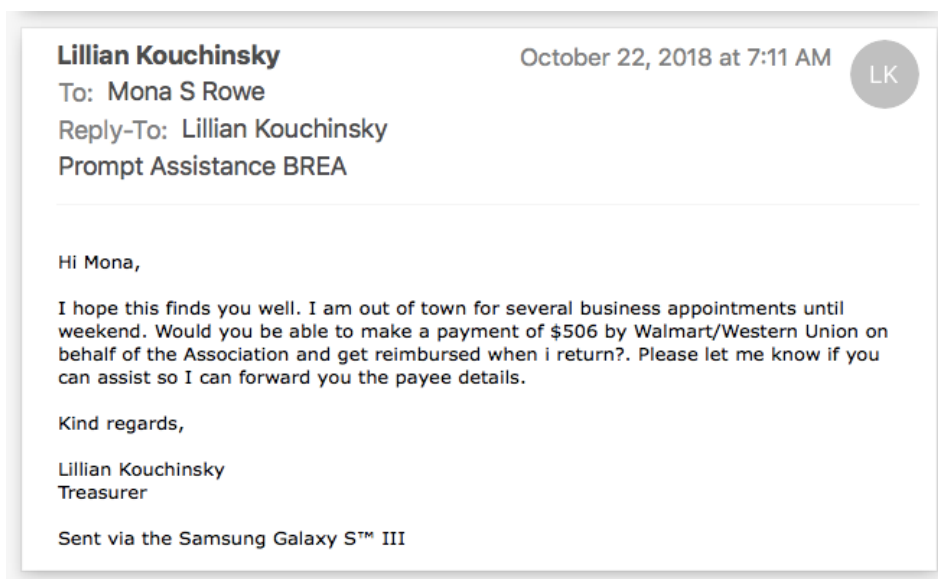
- Banking scams
- Investment scams
- IRS imposter scams
- Charity scams
- Lottery and sweepstakes scams
- Tax ID theft

Here are some tips:

- Avoid any unexpected contact.
- Never give out personal information.
- Keep your computer operating system and virus protection software up-to-date. Ditto for mobile devices.
- Make sure all accounts have a strong password. Don't use the same password for multiple accounts and change them regularly.
- Use safe and secure WiFi connections and avoid public WiFi.
- Sign-up for a call-blocking service.

Remember: Never click a link in an unsolicited email or divulge personal information, no matter how enticing the offer. If it sounds too good to be true, it usually is. Trust your instincts.

– Mona S. Rowe, msrowe.hi@gmail.com



Renew BREA Membership

Membership expires on December 31 of every year no matter when you paid your dues (which are requested by January 31 of the following year). To stay on BREA's mailing list, complete the form below and mail it to me along with your payment. Include your email address so BREA can send you timely information.

If you have questions or if your contact info has changed, email me at hellobylin@yahoo.com.

PLEASE PRINT

Last name: _____ First name: _____ MI: _____

Street: _____ City/State: _____ Zip: _____

Phone: _____ Email: _____

Membership type:

☐ annual (\$10) ☐ 5 years (\$40) Life ☐ (\$95)

Dues cover year(s) _____

Date: _____ Check amount: _____

MAKE YOUR CHECK OUT TO BREA

☐ I want to receive BREA News by mail via the U.S. Post Office.

☐ I want to receive BREA News by email only. Do not mail it to me via the U.S. Post Office.

Mail form and check (made out to BREA) to:

Beth Lin, BREA Membership Chair
81 Westchester Drive
Rocky Point, NY 11778

– Beth Lin, Membership Chair
hellobylin@yahoo.com

In Memoriam

We deeply regret to inform you of the passing of the following retirees and former employees:

Robert D'Angio Jr., 74, November 27, 2018

Robert W. Dillingham, 101, December 7, 2018

Istvan Dioszegi, 64, September 29, 2018

Donna M. Dowling, 65, October 11, 2018

Leon Forman, 79, October 20, 2018

Janet Whitehead, 82, November 8, 2018

More information may be found at BREA's website:
www.bnl.gov/bera/activities/brea

To post an obituary for a deceased BNL employee or retiree, send information by email to msrowe.hi@gmail.com or by snail mail to BREA's address in the panel below.

President's Message (continued)

If it comes to fruition it will be the most drastic physical change at the Laboratory since the change from Camp Upton to BNL. You can find more information at the publicly available web site: <https://discoverypark.bnl.gov/>.

Better yet, come to our meeting on Tuesday, January 8, 2019, to hear Marty Fallier, the project's director. Marty will do a presentation on Discovery Park and answer any of your questions.

– Steve Shapiro, shapiro@bnl.gov

Brookhaven Retired Employees Association

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