

# BREA News

<https://bera.bnl.gov/brea/>

Volume 22, Issue 1

January/February 2022

## BREA Meetings

BREA meetings are held on the second Tuesday of every month (except for August), at 1 p.m. All BREA members are invited to attend and participate.

With the BNL site still closed to retirees, Zoom meetings via video link have become routine. Contact any officer for help to join a meeting.

### Meeting Schedule

January 11, 2022

February 8, 2022

March 8, 2022

### BREA Officers

#### President

Arnold Moodenbaugh  
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#### Vice President

Vinita Ghosh  
[vjghosh11786@gmail.com](mailto:vjghosh11786@gmail.com)

#### Secretary

Laura Miller  
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Mona S. Rowe  
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## From the President

by Arnie Moodenbaugh, [moodenba@optonline.net](mailto:moodenba@optonline.net)

To fellow BREA Members,

We hope you have had a good holiday season. Our election of officers took place in the late fall of 2020. Membership Chair Beth Lin received and counted the snail-mailed and emailed ballots. Re-elected were President Arnold Moodenbaugh, Secretary Laura Miller and Treasurer Les Fishbone. The Vice President position was filled by electee Vinita Ghosh. We would like to thank Lillian Kouchinsky, who is stepping down from her VP post.

Spread across pages 2 and 3 of this newsletter is a brief summary of BNL's annual roundup of research hits. You will be amazed by – and proud of – Brookhaven Lab's wide-ranging impacts on science and society. BREA News has limited space as a print publication. So if you would like to see the full report on important discoveries and most-read stories in 10 areas of amazing science at Brookhaven Lab in 2021, please go to BNL's website at [www.bnl.gov](http://www.bnl.gov) and search for "Top 10." Thanks to the Media and Communications Office for compiling this piece.

For regular news of BNL science, subscribe to *Brookhaven This Week*. Go to <https://www.bnl.gov/newsroom/thisweek/>. You can also keep touch with "BrookhavenLab" on Facebook, Instagram and Twitter.

In 2020, BREA members endorsed charitable contributions of \$7,500 to LICares food pantry and \$2,500 to the Covid-19 response fund of United Way of Long Island (UWLI). At our

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# Top-10 Areas of Amazing Science at BNL in 2021

Because of limited space, here's an abbreviated recap of important discoveries and most-read stories in 10 areas of amazing science at the Lab in 2021. Go to BNL's website to read the entire press release.

**Basic research battles COVID-19** – The rollout of lifesaving COVID-19 vaccines tops our list of 2021 science breakthroughs, with BNL's "T7 gene-expression" system playing a crucial role. Both Pfizer and Moderna use genetic elements discovered by Brookhaven biologists more than 40 years ago to crank out "mRNA," the critical ingredient for hundreds of millions of doses. *See photo and caption on the right.*

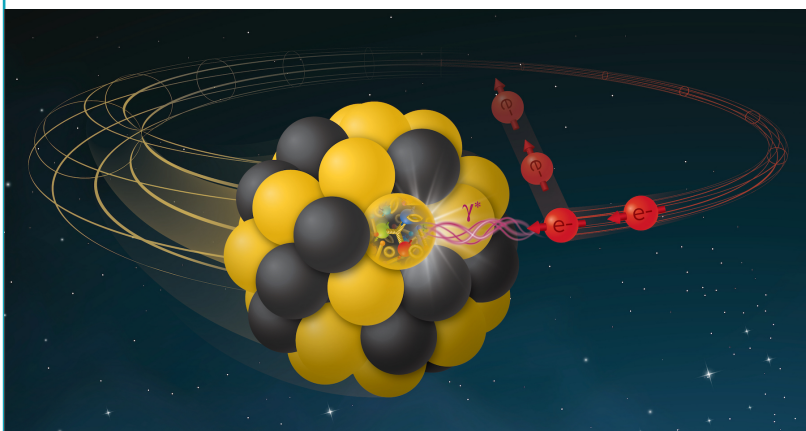
**Explorations of particle peculiarities** – Physicists at Brookhaven are heavily involved in two major experiments that reported results from explorations of particle anomalies this year.

**Collisions create matter... and turbulence** – Scientists tracking particle collisions using the STAR detector at the Relativistic Heavy Ion Collider created particles of matter and antimatter from light. It's an illustration of Einstein's famous  $E = mc^2$  equation. STAR physicists also detected tantalizing signs of "turbulence" in RHIC collision data gathered at different energies. These fluctuations may indicate a change in the way nuclear matter transforms from nucleons (protons and neutrons) to a soup of those particles' inner building blocks, quarks and gluons.



Many retirees, especially those who worked in the Biology Department, as did BREA Membership Chair Beth Lin, will recognize F. William Studier, Senior Scientist Emeritus at Brookhaven Lab. In the 1980s, Studier and collaborators deciphered key details of the T7 bacteriophage and turned what they learned into a system to produce copious amounts of desired proteins. The production of today's mRNA COVID-19 vaccines relies on these foundational discoveries.

– photo by Roger Stoutenburgh



In his BREA News messages for the past two years, BREA President Arnie Moodenbaugh has been mentioning the planned Electron-Ion Collider. He wrote in the March/April 2020 issue of the newsletter, "Looking ahead, the scientific outlook for BNL was strengthened by the Department of Energy award to BNL of the Electron-Ion collider, or EIC (<https://www.bnl.gov/eic/>). This is a major project that will have an impact throughout BNL, also extending to the surrounding communities."

**Electron-Ion Collider project achieves major milestone** – The plan to transform the Relativistic Heavy Ion Collider into the Electron-Ion Collider (EIC) received "Critical Decision 1" approval from DOE. This marks the next phase of translating the plans for the EIC into a state-of-the-art research facility that will open a new frontier in nuclear physics. Staff at Brookhaven Lab and Thomas Jefferson National Accelerator Facility are working with collaborators around the world to design the accelerator components while members of the EIC User Group lay out plans for possible detectors. *See drawing and caption to the left.*

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**Nanoscience discoveries with big commercial potential** – Scientists at the Lab’s Center for Functional Nanomaterials (CFN) made two discoveries related to making materials with possible commercial applications. One is a method for making extreme ultraviolet-sensitive photoresist “masks” by infusing existing organic materials with inorganic elements. The method could allow for etching smaller-scale features onto computer chips to increase their speed and efficiency.

Another group of scientists from the CFN and the National Synchrotron Light Source II used a range of methods, including x-ray studies, to discover how modifying an inexpensive commercially available porous material could trap noble gases within its nanoscale pores. If successful, the modified material could potentially capture rare noble gases such as krypton and xenon for use in specialized lighting, or to remove dangerous gases like radon from basements.

**The search for error-free qubits** – Brookhaven scientists are among those searching for materials that can reliably encode and store quantum information—an essential step toward developing quantum computers. Superconductors—materials in which pairs of electrons carry electrical current with no resistance—are promising candidates because they’re protected from certain kinds of interference.

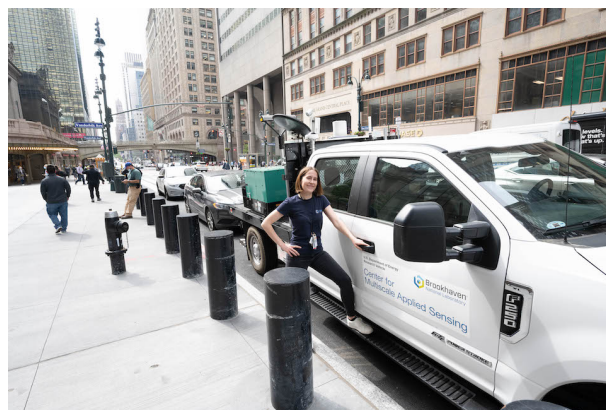
**Discoveries for building better batteries** – While battery research is carried out on multiple fronts to improve performance, all these studies have something in common: they use the National Synchrotron Light Source II. There, scientists have developed new ways to make experiments “smart,” using robots guided by machine learning and other artificial intelligence algorithms. They have also developed remote experimentation that allows researchers to control the instrumentation from afar. Together these approaches can give more researchers around the world access to the facility’s unique capabilities—even in a time of COVID-19 restrictions.

**Connecting clouds, climate, weather, and air quality** – Brookhaven scientists work on a big scale – from tracking particles in Earth’s atmosphere for improving weather forecasts and understanding climate change, to a major field campaign to study the coastal urban environment in and around Houston, Texas. In addition to these large-scale studies, Brookhaven scientists completed the first deployment of the Lab’s mobile observatory, a truck equipped with a custom suite of atmospheric sampling instruments to collect data on “urban microclimates.” *See photo and caption on the right.*

**Enzymes and catalysts for greener chemistry** – Biologists and chemists at Brookhaven have uncovered potential keys to greener chemistry in a string of successful studies this year.

**Opening doors to new scientists** – Brookhaven is well-known for conducting discovery science and developing transformative technologies—and also for inspiring next-generation science, technology, engineering, and mathematics (STEM) professionals.

– Karen McNulty Walsh, [kmcnulty@bnl.gov](mailto:kmcnulty@bnl.gov), and Stephanie Kossman, [skossman@bnl.gov](mailto:skossman@bnl.gov)



*BNL researcher Katia Lamer with the Lab’s mobile observatory in New York City. In the November/December 2020 and January/February 2021 issues of BREA News, retirees Vinita and Arup Ghosh in California, Steve Schwartz on Long Island, David Dougherty in Oklahoma, and Gwyn Williams in Virginia reported on climate change where they live.*

*– photo by Roger Stoutenburgh*



## 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](mailto:hellobylin@yahoo.com).

PLEASE PRINT

Last name: \_\_\_\_\_ First name: \_\_\_\_\_ MI: \_\_\_\_\_

Address: \_\_\_\_\_  
 \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Membership type:  
 annual (\$10)     5 years (\$40)    Life  (\$95)

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](mailto:hellobylin@yahoo.com)

## In Memoriam

We deeply regret to inform you of the passing of the following retirees.

- Jack Fajer, 85, October 25, 2021
- Elinor Norton, 92, November 6, 2021
- Laurence (Larry) Passell, 96, December 17, 2021

More information may be found at BREA’s website: <https://bera.bnl.gov/brea/>. To post an obituary for a deceased BNL employee or retiree, email information to [msrowe.hi@gmail.com](mailto:msrowe.hi@gmail.com) or mail it to BREA (see panel below for address).

## President’s Message (cont’d from page 1)

January BREA meeting, we should discuss making contributions in the new year. Our UWLI contribution is part of BNL’s annual United Way campaign. Retirees can make personal contributions to UWLI using a credit or debit card at <https://www.unitedwayli.org/bnlpledgeform>. You can also mail a personal check to United Way of Long Island, Attn: Donna Horoski, 819 Grand Boulevard, Deer Park, NY 11729. Please indicate that your donation is for the BNL/BSA United Way Drive.

We hope to see you at the next BREA Zoom meeting, January 11, 2022, at 1 p.m. EST.

– Arnie Moodenbaugh, [moodenba@optonline.net](mailto:moodenba@optonline.net)

## Brookhaven Retired Employees Association

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