

MEET OUR NEW COLLEAGUES

Keith Catalano (NSLS-II)
Steven Farrell (NSLS-II)
Rahul Jangid (NSLS-II)
Meng Li (CFN)
Richard Liotta (NSLS-II)
Jessica Ofenloch (NSLS-II)
Karthika Madathil Soman Pillai (CFN)
Emma Ramirez (NSLS-II)
Siyu Wu (NSLS-II)
Seunghoon Yang (CFN)
Hui Zhong (NSLS-II)

ENERGY AND PHOTON SCIENCES DIRECTORATE NEWSLETTER

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A MESSAGE FROM JIM

Welcome to the first newsletter of the calendar year 2024.

To start the new year, I would like to share a few thoughts about “community”. We are all parts of our own communities and collectively BNL is a multitude of these different communities. These all overlap and interact in different ways (departments, BERA, ERGs, etc.) and make the Lab a unique and special place. We contribute to this BNL community and, in turn, BNL has influenced each of our lives.

I have often spoken about our distinguished alumni. In my way of thinking all who have spent time working here, and who have been part of the Lab community, are our distinguished alumni. Some examples of our distinguished alumni are: scientists pursuing new research opportunities, term appointments, contracts ending, and retirements. All are our distinguished alumni. I am grateful for all the distinguished alumni of our Lab community. You have contributed to science, touched our lives and made the Lab a better place. Your impact is profound.

As a member of the Suffolk County greater community, I would like to make an appeal for United Way. To quote the [announcement](#): “Brookhaven Lab has helped fellow Long Islanders by supporting United Way for decades. United Way advances the common good, creating opportunities for Long Islanders to live better lives with specific efforts for health, education, and financial stability. One hundred percent of contributions to the United Way of Long Island stay on Long Island to help “Long Islanders”. Some of the programs are: Project Warmth (to help families heat their homes), YouthBuild (to help young people earn their high school equivalency diploma and learn job skills), Mission United (providing veterans career training, employment assistance and emergency aid). Contributions are accepted through January 12, 2024.

Lab Director JoAnne Hewett [discusses her experience](#) with breast cancer and the importance of early detection. Being able to speak openly about important issues and experiences is a way we strengthen our Lab community. Director Hewett is also interviewed by our Chief Diversity Officer, Noel Blackburn, [in the latest DEI newsletter](#). I urge all of you to read this.

Congratulations to Andy Broadbent of NSLS-II. He and his team won DOE’s Project Leadership Institute Capstone Award - [The Human Element](#).

Congratulations to Kenneth Evans-Lutterodt of the NSLS-II. He partnered with Tina Brower-Thomas of Howard University [to grow the perfect diamond thin films for quantum applications](#) through a \$1.5 million grant through the Department of Defense’s University Instrumentation Program (DURIP).

Please see the science highlights later in this newsletter. They are a testament to the amazing science that occurs in EPSD through all your efforts. Thank you!

The next quarter brings us the Lunar New Year on February 10th. We have Black History Month through February and National Women’s History Month through March. We celebrate Martin Luther King, Jr. Day on Monday, January 15th and International Woman’s Day on Friday March 8th. The quote this quarter comes, fittingly, from a Black woman and speaks directly to the definition of a community:

“The greatness of a community is most accurately measured by the compassionate actions of its members” – Coretta Scott King



Jim Misewich

From the EPSD DEI Council

POSTERS: You may see various colorful posters in buildings on site from the Lab Diversity, Equity and Inclusion (DEI) Office centered around ideas of respect. We have ones in ISB, CFN and NSLS-II and will have more in our other buildings. It is important that we all prioritize these ideas about. We may not always agree in our ways of approaching our jobs or other aspects of life, but we all owe each other respect and courtesy.

PEER COUNSELLORS: From the Lab DEI resource pages, "All the DEI Councils offer Peer Counseling to employees which is an informal avenue that provides an alternative safe place for staff to discuss concerns that might not rise to the level of the Lab's formal complaint process that typically requires investigation through the Lab-Wide Employee Support System. Peer Counselling is for staff who would like to discuss something that is on their mind and gain some ideas and advice; for example:

- A difference of opinion or conflict with a fellow employee or supervisor, or
- A problem that is bothering them that they could use assistance in charting a path forward.

The Peer Counselor may work with a staff member to help resolve an issue but will not conduct an investigation and does not represent an investigative body. The intent is that these conversations will remain confidential to the extent possible. However, if the Counselor believes there is a potential violation of law, U.S. Department of Energy Regulations, and/or Brookhaven Science Associates requirements, or an imminent hazard, the EPS Peer Counselor must promptly refer the matter to the appropriate Laboratory manager for action and resolution.

The EPSD [Peer Counselors](#) are members of the DEI Council that operate under the guidelines described above and welcome conversations about any workplace concerns with EPSD employees and guests. Be assured that confidentiality is an utmost priority within the constraints of Lab policy. Our current EPSD roster of Peer Counsellors is:

Diane Cabelli (Ext. 4361, cabelli@bnl.gov),
Michael Cowell (Ext. 7076, cowell@bnl.gov),
Kenneth Evans-Lutterodt (Ext. 2095, kenne@bnl.gov),
Vivian Stojanoff (Ext. 8375, stojanof@bnl.gov),
John Tranquada (Ext. 7547, jtran@bnl.gov),
Grace Webster (Ext. 3227, gwebster@bnl.gov), and
Xi Yang (Ext 7531, XiYang@bnl.gov).

We are currently undergoing retraining or training of new members to the DEI Council so expect that the list will be frequently updated. We welcome emails or phone calls to either discuss issues or to arrange for times for private conversations.

ANONYMOUS COMMUNICATION: On the EPSD DEI website we have a process to receive [anonymous messages](#) to the DEI Council and Jim Misewich. These really are anonymous to all of us. In addition, there are green envelopes in many mail rooms that can be used to

mail anonymous comments and/or suggestions to the Council. The envelopes are pre-addressed; you need to only put in your comments and place it in the interoffice mail and they will be routed directly to the EPSD DEI Council chair (Cabelli). The anonymous communications will be answered on the "Ask Jim" webpage.

DEI PERFORMANCE GOALS: Lab employees are required to have DEI goal(s) on their performance appraisal goal setting document. To help, the Lab DEI pages include a [guidance document](#) with suggestions for goals that meet the requirement of personal, group and organizational impact. In addition, we have a web page with [suggested goals](#).

In 2024

Services at the Lab

We have food trucks coming to Brookhaven Square Park each weekday. The Artisan by Rollin' Ghost will serve lunch in the cafeteria from 11:00 am to 1:30 pm on all weekdays. The menu includes hot paninis, freshly made sandwiches, salads, grab-and-go snacks, and beverages. You can just go or you can [pre-order online](#).

DEI Quarterly Themes Initiative:

The Diversity, Equity and Inclusion (DEI) Quarterly Themes program "helps foster a respectful and inclusive work environment", and frees all of us to bring our best, most creative and true selves to our Lab community.

The second quarter of the fiscal year has the Quarterly Theme program restarting. The current quarterly theme is Psychological Safety. Our previous two Quarterly Themes, [Emotional Intelligence](#) and [Inclusion](#) gave fundamentals to build upon in our understanding of Psychological Safety. As before, there are resources available on the Lab Diversity, Equity and Inclusion website to facilitate the process. Please avail yourselves of these resources for discussions.

Events in the Past Quarter

There were celebratory events late summer and fall to welcome Dr. Hewett to the Lab, and we have included the video of the [Big Bang Concert](#). You will see many of our colleagues from EPSD in this video - both performing and enjoying the evening.

We remembered all who served in the military, past and present, on Veterans Day and bring you a [video](#) of the ceremony held here by the ERG.

The Lab DEI Office program, [Diverse Perspectives](#), that will be comprised of short videos where members of the Lab community give their perspective on DEIA, the Lab and their community has added another video. [Debbie Bauer](#) was joined by [Jonathon Greene](#), on November 2, 2023.

The Hispanic Heritage Group (HHG), an Employee Resource Group at the Lab, aims to raise awareness and appreciation of Hispanic culture at the Lab and to highlight the contributions of Hispanic people in science and

operations at the Lab and beyond. Here we [Meet Senior Applications Analyst Jennefer Maldonado](#).

Brookhaven Women in Science (BWIS) hosted the 2023 Joanna Fowler Award Ceremony on November 16, 2023. We profiled the award winners in a previous newsletter. Here we bring you the link to the article about award winners [Sha Tan and Jace Conrad](#).

Brookhaven Lab's Asian Pacific American Association (APAA) recognized two students pursuing Ph.Ds. at Stony Brook University during the annual Mow Shiah Lin Scholarship ceremony. The 2023 awardees and their areas of study are:

Qingting (Tina) Hu – genetics with a focus on disease-based and translational research, and

Joanne Saldanha – genetics with a focus on oncology and cancer research.

These awardees were chosen by Brookhaven Lab scientists and members of the APAA. Selection criteria include academic records, references, career goals, civic and volunteer activities, and other factors deemed appropriate by the selection committee. They each receive \$2,000 in memory of the late Brookhaven scientist for whom the scholarships are named. You can find out more about [Mow Shiah Lin here](#).

We remind you of an ongoing program, the BERA Mandarin Language Club, a language conversation club for employees who wish to brush up on the Mandarin language through casual conversation with interested fellow employees. Since the first meeting on Tuesday, February 23, 2021, the club has been meeting every two weeks at noon. Questions? Contact Eliot Jung at (631) 344-3228 or ejung@bnl.gov. Hosted by BERA/Recreation and the APAA.

Upcoming Events this Quarter

The lunar new year is February 10th. In Colorado, Governor Polis signed into law the celebration of the Lunar New Year as a state holiday on the first Friday in February - thus the Lunar New Year in Colorado is celebrated on February 2nd this year.

As noted earlier, Black History Month is February and National Women's History Month is March. This year, we celebrate Martin Luther King, Jr. Day on Monday, January 15th and International Woman's Day on Friday, March 8th. There will be programs associated with all of these; please watch the Lab calendar for the times, dates and different events.

From the Employee Engagement Survey

The ongoing work in response to the DeepDive Survey results from 2022 can be viewed on the [Employee Experience Website](#). You can also revisit the All-Hands briefing from former Brookhaven Lab Director Doon Gibbs and other lab leaders joined by Scott Young of CultureIQ by re-watching the [DeepDive Survey Results Briefing Video](#).

The Working Group continues to meet, and its Chair has begun meeting with the DEI Council and Jim to discuss possible actions. A member of EPSP is now attending the

Management meetings held by Jim and attended by his direct reports, and they are working out a mechanism for reporting information back to staff of EPSP. This was an initiative related to the Communications issues found in the DeepDive survey and in the earlier CultureIQ survey.

Instrumentation in EPSP

The SIX Beamline at the NSLS-II

by Valentina Bisogni

The 2-ID beamline, called SIX, is one of the 29 operating beamlines at the NSLS-II. It was realized as part of the NEXT Project that coordinated the design and construction of the second group of beamlines at the NSLS-II, starting from approximately 2012. The label 2-ID comes from the fact that it occupies the second port of the NSLS-II ring where an undulator is placed as insertion device (ID) to produce the X-rays used by the beamline. Its name SIX is the acronym for **S**oft **I**nelastic **X**-ray **S**cattering, in reference to the experimental technique performed there, called in full Resonant Inelastic X-ray Scattering (RIXS).

Why do scientists need to perform Resonant Inelastic X-ray Scattering experiments? Let's think about a game of pool. Player 1 cues the ball first and it hits a firm cushion bouncing back without losing speed being able to strike other balls and reach the pocket. Then, Player 2 plays the ball into a soft cushion. When the ball bounces back, it gets strongly decelerated and stops. By looking at the way the balls get scattered around the table during the game, an observer can infer information about the pool table cushion that was hit each time. Similarly, scientists use RIXS to get information about their samples; in this case, the balls are replaced by the X-rays, and the table represents a selected material. By collecting the X-rays scattered off the sample, and by measuring their energy, scientists can reconstruct the energy transferred to the sample and thus the excitations created in the material.



The 2-ID Beamline SIX of the NSLS-II: Its 15m long spectrometer arm is located in a separate building annexed to the NSLS-II experimental floor

The obtained RIXS spectrum can present several types of excitations involving all the electron degrees of freedom (lattice, spin, orbital, and charge) thus providing information on the electronic and magnetic properties of the system under study. The materials investigated at the 2-ID Beamline are typically those of interest to the condensed matter physics community and they range

from quantum materials, unconventional superconductors, van der Waals, quantum spin liquids, etc. Notable excitations studied with RIXS are for example: 1) spin-waves, useful to reconstruct the magnetic interactions within a material, even when the size is limited to few microns or the thickness to few nanometers, 2) charge-excitations, such as the charge density wave in high-temperature cuprate superconductors, useful to unravel the competition or cooperation relationship with superconductivity, 3) crystal field or exciton-like excitations important to unveil the electronic structure of a material and their bound character. The interested reader may find an extensive list of published works related to the 2-ID Beamline [here](#).

The instrumentation required for RIXS experiments is quite impressive in terms of size and complexity. To be able to finely resolve the energies of the scattered X-rays, a long beamline and a several-meter-long spectrometer arm are required to achieve a high energy resolution. The SIX Beamline at the NSLS-II has one of the longest spectrometer arms (15m) yielding the best energy resolution for soft X-rays RIXS studies. To host such a spectrometer at the NSLS-II, a dedicated external building was constructed with stringent thermal and stability performances. More information about the 2-ID Beamline can be found [here](#).

Highlights of Science in EPSD

Our Outreach

NSLS-II: [Students Discover the Mathematics Within Dragonfly Wings](#). High schoolers find a new example of nature's use of the "golden angle". Two high school students were able to conduct research at Brookhaven via its High School Research Program (HSRP). Their work was published in a top journal, Scientific Reports; an impressive achievement.

Our Science

CFN: [Brainstorming with a Bot](#): CFN's Kevin Yager develops a chatbot with an expertise in nanomaterials.

CFN: [A Bright Future for Extreme UV Lithography at Brookhaven Lab](#). Innovative photoresist materials are paving the way for smaller, high performance semiconductor chips.

C²QA: [National QIS Research Centers Career Fair Continues to Grow](#). As the field of Quantum Information Science (QIS) accelerates, national laboratories, academia, and industry come together to inform and recruit the next generation of quantum professionals.

CO: [Electrons are Quick-Change Artists in Molten Salts, Chemists Show](#): Scientists have shown how electrons interacting with the ions of the molten salt can form three states with different properties. Understanding these states can help predict the impact of radiation on the performance of salt-fueled reactors.

NSLS-II: [Making More Magnetism Possible with Topology](#). MIT researchers show how topology can help create magnetism at higher temperatures.

NSLS-II: [The Tertuliano Lab Has a Bone to Pick — and the Tools to Explain How it Breaks](#). Tertuliano creates new

tools to measure tissue mechanics at the smallest scales imaginable.

NSLS-II: [Team Engineers Nanoparticles Using Ion Irradiation to Advance Clean Energy and Fuel Conversion](#). The work demonstrates control over key properties leading to better performance.

NSLS-II: [In an Unexpected Twist, High Levels of Mercury Have Been Traced to Particular Cell Types in Brains of Mammals](#).

NSLS-II: [Imparting Glass with New Properties](#). DOE research award winner and new NSLS-II postdoc Evan Musterman aims to enhance capabilities at the SRX beamline via his research into glass crystallization.

Highlights of People in EPSD

NSLS-II: [Meet Michael Maklary, NSLS-II Electro-Mechanical Technician](#). Maklary provides beamline and scientific workspace support for NSLS-II's imaging and microscopy program.

C²QA-Q&A: [Andrew Houck '00 on Princeton's New Quantum Science Institute](#). "We are hoping it will have an enormous impact," Houck says of quantum science.

Welcome to EPSD

We welcome Denise Yazak back to the NSLS-II from Stakeholders Relations.

In Memorium

Richard Magee Osgood, Jr. - October 20, 2023. Many of us knew him as he served as ALD for EPSD in 2000-2002.

Help Welcome our New Colleagues to EPSD

Once again, we are introducing our newly hired colleagues to you. Join me in welcoming them to the directorate:

Keith Catalano, Information Technology

Supervisor: Jeffrey Keister
Email: kcatalano@bnl.gov
Start Date: 10/23/2023

Steven Farrell, Postdoctoral Res Assoc/Fellows

Supervisor: Eli Stavitski
Email: sfarrell1@bnl.gov
Start Date: 12/11/2023

Rahul Jangid, Postdoctoral Res Assoc/Fellows

Supervisor: Claudio Mazzoli
Email: rjangid1@bnl.gov
Start Date: 10/16/2023

Meng Li, Scientific Staff

Supervisor: Judith Yang
Email: mli4@bnl.gov
Start Date: 11/13/2023

Richard Liotta, Technical

Supervisor: John Trunk
Email: riotta@bnl.gov
Start Date: 10/30/2023

Jessica Ofenloch, Administrative

Supervisor: Robert Lee

Email: jofenloch@bnl.gov

Start Date: 10/23/2023

Interests: Playing and coaching softball as well as embarking on camping adventures with family.



Karthika Madathil Soman Pillai, Postdoctoral Res Assoc/Fellows

Supervisor: Gregory Doerk

Email: kmadathil@bnl.gov

Start Date: 10/30/2023

Emma Ramirez, Technical

Supervisor: Jerome Malley

Email: eramirez@bnl.gov

Start Date: 10/10/2023

Siyu Wu, Postdoctoral Res Assoc/Fellows

Supervisor: Ruipeng Li

Email: swu4@bnl.gov

Start Date: 11/13/2023

Seunghoon Yang, Postdoctoral Res Assoc/Fellows

Supervisor: Chang-Yong Nam

Email: syang4@bnl.gov

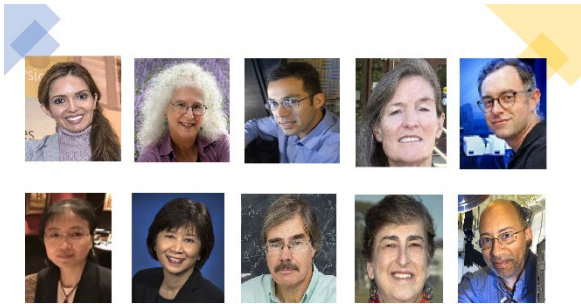
Start Date: 12/1/2023

Hui Zhong, Scientific Staff

Supervisor: Sanjit Ghose

Email: hzhong@bnl.gov

Start Date: 12/4/2023



Members of the EPSD DEI Council (clockwise from top): Priscilla Antunez, Diane Cabelli, Fernando Camino (on leave), Michael Cowell, Mark Dean, Kenneth Evans-Lutterodt, Vivian Stojanoff, John Tranquada, Grace Webster and Xi Yang.



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