



Growing the STEM Pipeline with Brookhaven Lab

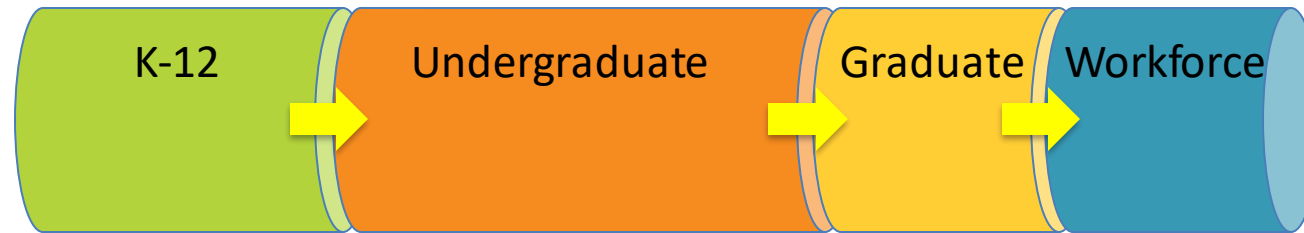
BNL Community Advisory Council, May 11, 2023

Bernadette Uzzi, Manager, K-12 Programs

Aleida Perez, Manager, University Relations and DOE programs

Kenneth White, Manager, Office of Educational Programs





“Preparing the next generation of scientists, engineers, technicians, and teachers utilizing the unique scientific tools and intellectual resources of Brookhaven National Laboratory”

- *Early exposure and engagement through informal education programs*
- *Internships and specialized programs for students and educators*
- *Expanding the reach of BNL’s scientific community through workshops, meetings, and conferences*
- *Develop college relationships to promote research and engineering collaborations*
- *Develop user candidates for BNL facilities*
- *A workforce development leader in DOE – WDTS programs*

Field Trips

- 11,500 students (27,500 activity participants)
- ≈ 20% virtual programming
- ≈ 30% minoritized communities
- Aligned with BNL mission areas, NYS learning standards

Teacher Professional Development

- SciEd Day
- In-person and virtual sessions
- Pre-Service Teachers
- WDTS Pathway Summer Institute –
 - 2023 Climate and Earth Science pilot



Contests

- MS and HS Regional Science Bowl
- Bridge Building
- MagLev
- Science Fair

Outreach

- STEM Nights
- Career Fairs
- Community Events



Engaging Diverse Communities

- Summer Science Explorations
- Special events



girls
inc.

of Long Island



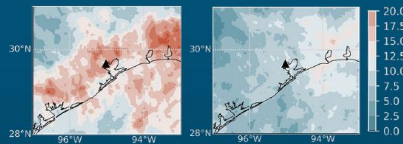
girl scouts
of suffolk county



Meet Brookhaven's High School Researchers

Amanda Rakotoarivony Longwood High School

"...this internship allowed me to truly connect the topics I've learned in school to the real-world research that's being done... [and] showed me how research and collaboration is interdisciplinary at the core."

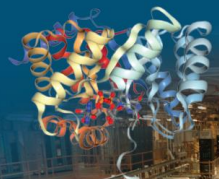


Amanda used machine learning to investigate cloud and precipitation properties to help scientists better understand how aerosols—tiny particles suspended in Earth's atmosphere—affect the severity of thunderstorms.



Lauren Gurney & Emma Gallagher Shelter Island High School

"This project challenged me. It showed me that real scientific achievements can take a very long time to accomplish, and even then, there are always more questions to be asked." -Gallagher



Lauren and Emma used the NSLS-II to solve the structure of a protein.



SCIENCE LEARNING CENTER

Then & Now: Lisa Miller

Ever since I was young, I always wondered what things were made of,

like my blue jeans, my Cheerios, my schoolbooks, and my softball glove.

In the seventh grade, I won first place in the science fair

for determining the amount of sugar in different kinds of soda. Did you know that A&W root beer has more sugar than Coke?



I especially liked to look at things through a magnifying glass or a microscope – so I could see the tiny parts of much larger objects.

I had so much fun with microscopes over the years that I've made a career out of using them.

Even today, I am still using microscopes to study the makeup of things, but at Brookhaven Lab I now use x-rays and infrared light to see things that regular microscopes cannot see.



Authentic STEM Experiences

DOE-funded college internships

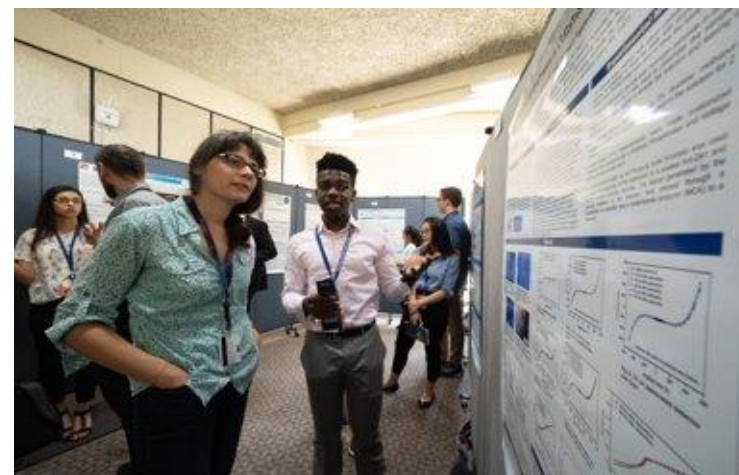
- Exposure to Brookhaven Lab and DOE mission
- National program; ~30% interns are from local colleges/universities
- Return to Brookhaven Lab as an employee

High School Research Program

- Local 11th and 12th grade students
- Early engagement with Brookhaven Lab and DOE
- Return as DOE internship programs participants

Suffolk Community College Tech program

- Technician development program
- Participation in DOE-CCI program
- Potential employment



Community Engagement/Citizen Science

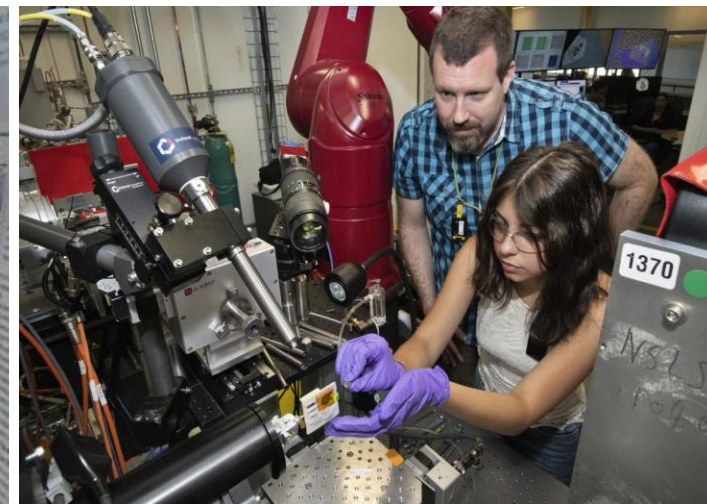
Open Space/Day in the Life River

- Environment as a gateway to science
- Local environmental stewardship
- Collaboration with Central Pine Barrens Commission and NYS DEC
- Building local partnerships between schools and environmental and educational groups
- ~2500 students, ~60 schools, ~100 experts



Student Partnership for Advanced Research and Knowledge (SPARK)

- Teacher and student-led research program
- Local partnerships with SBU, Cornell Cooperative and others
- Since 2017, 28 schools, 33 teachers, 300 students
- Multiple publications



Inclusive and Diverse STEM pipeline

STEM Prep Summer Institute

- Capstone program for minoritized communities (9th grade)
- Creating a sense of belonging in STEM
- Connecting with mentors



Rising STEM Scholars

- A follow-up program to STEM prep
- Building a STEM Pathway to the High School Research Program and DOE Internships

DOE College Internship Programs

~45% female

~35% Underrepresented Minorities





Community Engagement External involvement events

Amy Engel, Manager, Environmental and Community Engagement

Brookhaven National Laboratory

Stakeholder Relations



Community Engagement seeks to create opportunities for the Lab's employees to engage with the community.

- Strengthens the bonds with our neighbors
- Enhances communication and builds trust
- Raises awareness of the Lab's programs



PubSci

- PubSci lets you chat with expert scientists over a drink.
- See the casual side of cutting-edge research and scientific discovery happening every day at Brookhaven National Lab.
- Covers different topics from the Big Bang to tomorrow's technologies.
 - 5/10 on Climate and Wildfire
 - October date and topic TBD



A science café presented by
Brookhaven National Laboratory

BURNING QUESTIONS

— DO —
WILDFIRES
— FUEL —
CLIMATE
CHANGE?

Learn why scientists fly through smoke plumes, create clouds in the lab, and more to find answers!

WITH

Ogo Enekwizu ★ Ernie Lewis ★ Art Sedlacek
BROOKHAVEN NATIONAL LABORATORY

WEDNESDAY, MAY 10, 2023
7:00 PM • PAINTERS' RESTAURANT
416 South Country Road • Brookhaven, NY 11719

Admission is free • Menu and bar items available for purchase

If you're the kind of person who plans ahead, tell us you're coming.
Register online for bonus raffle entries!

www.bnl.gov/pubsci

 Brookhaven
National Laboratory

managed by Brookhaven Science Associates
for the U.S. Department of Energy

Science in the Community

- Brookhaven Lab is bringing science into the community, making it more accessible to everyone.
- You don't have to come to us, we'll come to you!
- We're partnering with local museums and other public venues to give you a chance to talk to scientists from Brookhaven Lab and learn about their research.
 - 4/22 Earth Day at Jones Beach Nature Center
 - 6/3 Vanderbilt Planetarium
 - Fall TBD



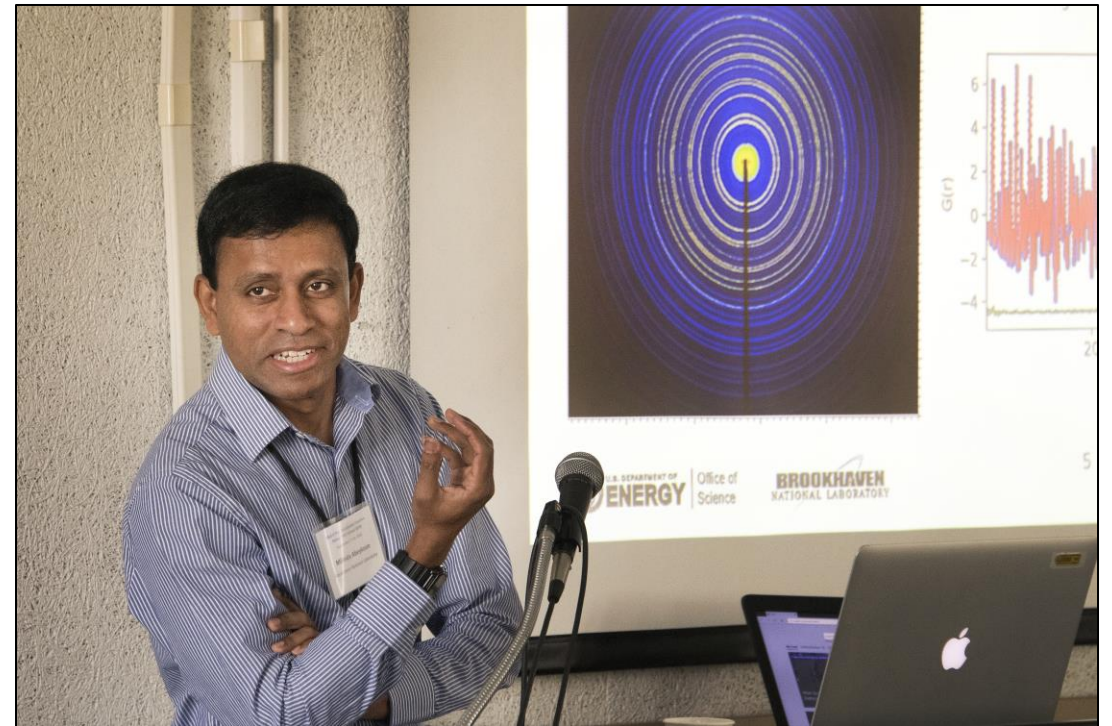
Science on Screen

- Science on Screen creatively pairs film screenings with compelling introductions and post-screening discussions with local scientists.
- Each film is used as a jumping off point for the speaker to engage our audience and reveal current scientific research or technological advances.
- 6/21 featuring Dr. Susan Pepper
 - Chair of the Nonproliferation & National Security Department (NNS).
 - Extensive experience working with the International Atomic Energy Agency.



Speakers Bureau

- Overview of the Lab, its science, impact and educational opportunities. Presentations geared towards:
 - Local civics associations.
 - Rotary clubs, chambers, libraries etc.
- Science-based presentations geared toward:
 - Scientific organizations that may be interested in scientific presentations i.e Astronomy clubs, American Physical Society, Climate groups.



Volunteer Activities

- **March-April:** Habitat for Humanity Builds 4/4 & 5/2
- **May:** Island Harvest 5/16 food sorting, food drives for Stamp Out Hunger
- **June:** Farming at Sisters of St. Joseph's farm
- **August:** United Way (UW) Stuff-A-Bus of school supplies week 8/21-8/25
- **November:** UW pet calendar, campaign kick-off
- **December:** UW auction 12/5-12/7 & Adopt-A-Family 12/11-12/13, Wreaths Across America





Summer Sundays Open House Tours at Brookhaven National Lab

Danielle Pontieri, Protocol Specialist

Brookhaven National Laboratory

Stakeholder Relations

May 11, 2023



@BrookhavenLab

Purpose & History

- Provide opportunities for the public to get to know the Lab
- Strengthen connection to the community
- Increase awareness of the Lab's science
- Make science accessible and spark interest for kids
- Historically, 1000+ people per day



EXPLORE BROOKHAVEN LAB



July 9

Family fun
at the Science
Learning Center



July 16

Small-scale science
at the Center for
Functional Nanomaterials



July 23

Dazzling discoveries
at the National Synchrotron
Light Source II



July 30

Fascinating physics*
with the universe's
basic building blocks

*See website for updated features.

