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

of Long Island
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."

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 research to solve the structure of a protein.

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 AMF 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.
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
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:
  o Local civics associations.
  o Rotary clubs, chambers, libraries etc.

• Science-based presentations geared toward:
  o 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
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.