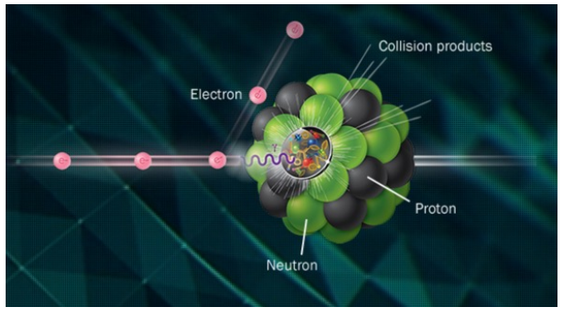
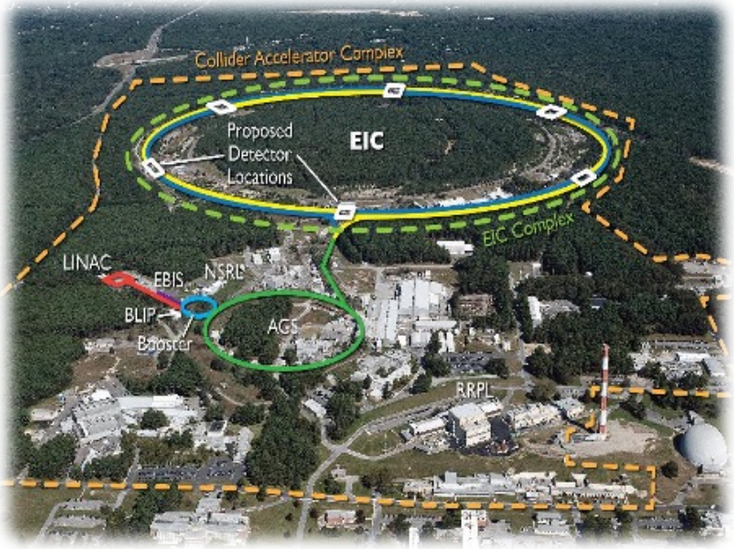

Brookhaven
National Laboratory
U.S. DEPARTMENT OF
ENERGY
BNL-MSI Fellowship Program for Research Excellence and Preparation via Nuclear Physics Traineeships (PREP-NPT)*
Mickey Chiu, Abhay Deshpande
8 Sep 2022
@BrookhavenLab
*A DOE Nuclear Physics Traineeship Program

Mentor Volunteers from BNL NP Groups

RHIC, EIC, CFNS, Instrumentation:

Dr. Lijuan Ruan, Prof. Abhay Deshpande, Dr. Elke Aschenauer, Dr. Oleg Eyser, Dr. Luca Cultrera, Dr. Triveni Rao, Dr. Mickey Chiu



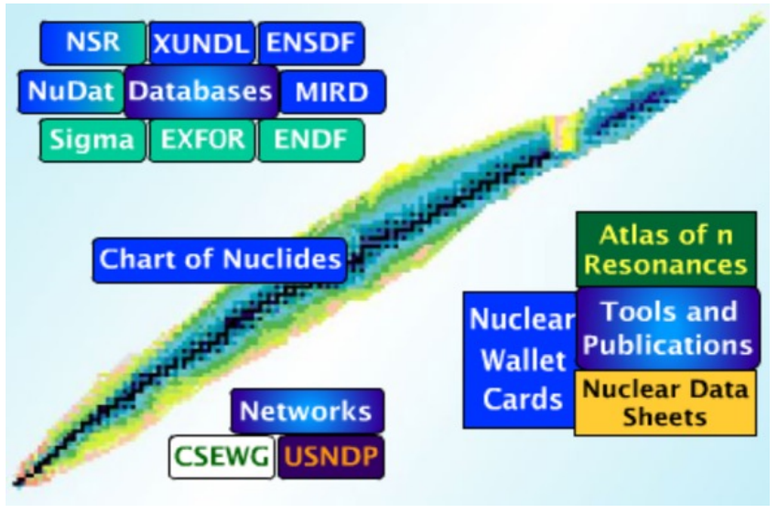


Nuclear Physics Theory:

Dr. Bjeorn Schenke, Dr. Raju Venugopalan

NNDC (National Nuclear Data Center):

Dr. David Brown, Dr. Gustavo Nobre, Dr. Matteo Vorabbi, Dr. Alejandro Sonzogni, Dr. Elizabeth McCutchan, Dr. Simerjeet Gill, *Dr. Luis Betancourt*



CSI (Computation Science Initiative):

Dr. Shantenu Jha, Dr. Li Tan, Dr. Mikhael Titov

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The University Partners and Advisors…

Florida A&M University: Prof. Carol Scarlett

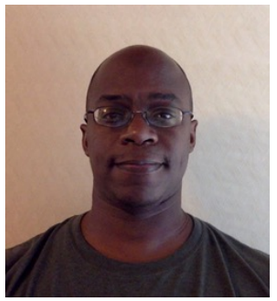
Howard University: Prof. Marcus Alfred

Morgan State University: Prof. Willie Rockward

University of Puerto Rico: Prof. Ratnakar Palai

Texas Southern University: Prof. Mark Harvey

Stony Brook University: Prof. Abhay Deshpande



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Plus the BNL Office of Educational Programs

Noel Blackburn

- Existing infrastructure and experience for students
  - Have successfully run SULI, CCI, HSRP, and other internships for decades
  - Provided organizational framework for bringing student fellows on-board
  - Provided training in giving scientific talks, writing reports and articles, professional behavior
  - Organized talks, tours, and social activities
  - Student surveys already part of evaluation
- Longstanding relationship (network) to universities for recruiting
  - Key to recruiting students and finding those diamonds in the rough

Program Goals for the Fellows

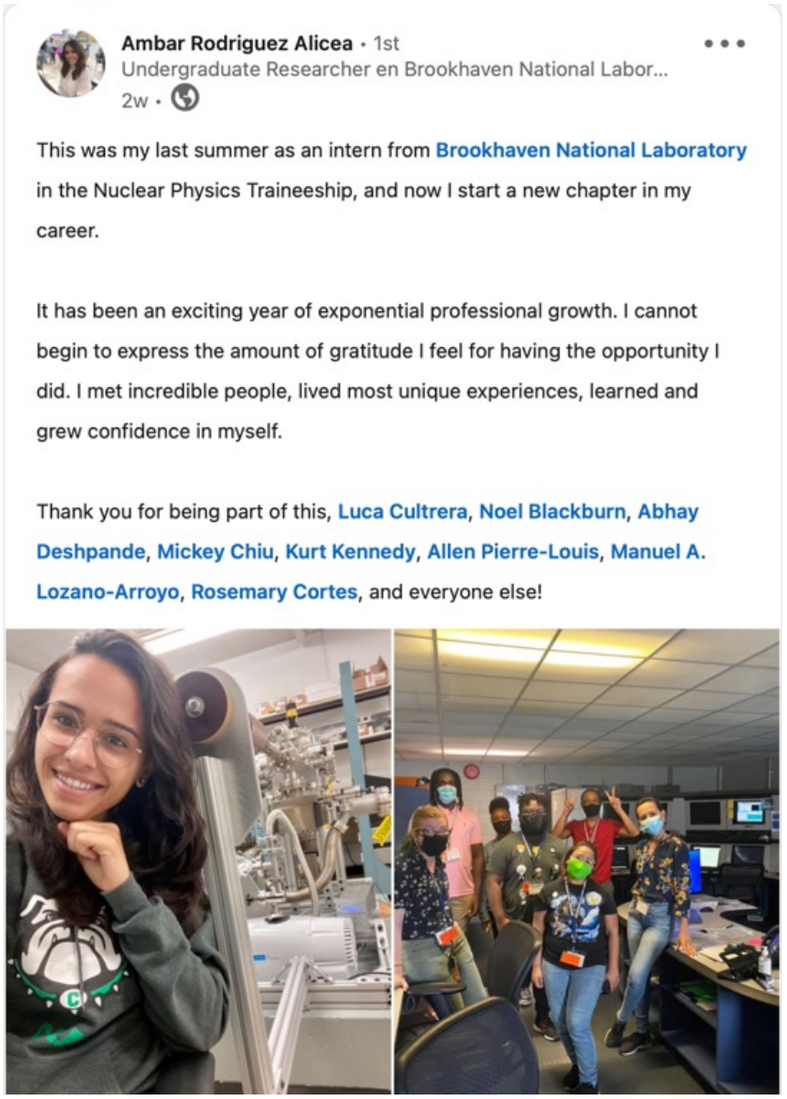
1. *Provide the support they need*
   - Program includes *financial support* for full-time (40 hrs/wk) summer student research @ BNL
     - $6000 stipend for the summer, full support for lodging and travel
     - *Bring students to BNL in summer*
   - Supports student research for 2 days per week during the Fall and Spring semesters (15 weeks each)
     - $3600/semester ($15/hr)
     - We want you to be able to concentrate on your research and studies
   - *Long term commitment (1-2 years)* for all Fellows, through your final undergraduate years and into graduate school or other STEM career
     - Expect intense mentorship from Scientists and Professors
   - *Individualized* Research and Education Plan for each Fellow provided by university professors and BNL scientists

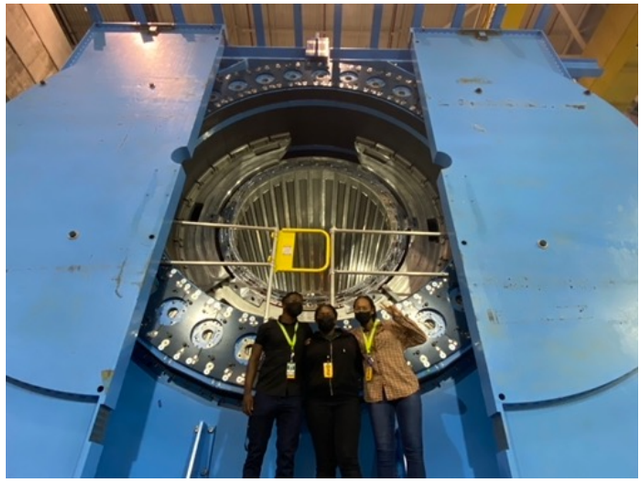
Program Goals for the Fellows

2. *Provide the structure that makes the goals possible*

- Supplemental courses provided by Stony Brook University, and lectures/seminars from BNL scientists, in addition to the individual mentoring from research advisors
  - Python bootcamp, GRE Physics Workshops
- Form a peer support community of Fellows
  - A group of nerdy friends is a good thing!
  - It helps to be able to interact with someone with the same background
- Give them opportunities to see what being a scientist is like
  - Do the research, and present the research
  - 10+ talks/posters presented or to be presented at APS DNP CEU 2022, NSBP, NAPAC 2022
  - 4 papers published or in pipeline to be published with student fellows as contributing author
- And we're very open to any ideas to improve this program
  - Trying to stay away from preconceived notions of what should work (clearly what we have been doing wasn't working too well)

Program Results for the Fellows





- 5 fellows have graduated from program

Going to Graduate School	Graduate Program	BNL Mentor
Brynna Moran	Stony Brook MS Physics	Abhay Deshpande
Allen Pierre-Louis	Stony Brook MS Physics	Abhay Deshpande
Ambar Rodriguez	Michigan St PhD Physics	Luca Cultrera
Rosemary Cortes	Univ of Puerto Rico MS Physics	Luis Betancourt
Marcus McLaurin	Morgan St MS Math	Matteo Vorabbi

- 7 fellows currently in program

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Conclusion

- There's a lot of excitement and support for this program from BNL and our partner universities
  - It fills a crucial missing link in the pipeline
  - We believe ability to keep students intellectually involved in the research through the semester is key to maintaining their interest
  - Provides opportunities for exposure to NP research to MSI's, and a partnership, where it was completely missing
  - Strong relationship with SBU, CFNS and the Edward Bouchet Initiative
  - Program started as a 2-year Pilot in the DOE ONP, transitioning to on-going RENEW-NP program

- Our primary evaluation metric is how many of these Student Fellows go on to graduate school in physics, particularly NP, or to other STEM positions
  - So far this has been wildly successful – 5 out of 5 have gone on to grad school
  - Another 7 students in the pipeline
  - We will continue to evaluate how well they do and *how we can improve the program*

BNL PREP-NP
Research Projects Abstracts

PREP—NP Student Fellow	Mentors	Dept	2021 Project
Grace Farrell (Morgan St)	Prof. Rockward, *Dr. McCutchan*, Dr. Sonzogni	NNDC	Systematics of Inverse-Beta-Decay Antineutrino Yields
Rosemary Cortes-Robles (UPR)	Prof. Palai, *Dr. Betancourt*, Dr. Gill	NNDC	Understanding metal speciation in molten salts using X-ray absorption spectroscopy
Khadim Mbacke (Morehouse)	Prof. Scarlett, *Dr. Nobre*, Dr. Brown, Dr. Vorabbi	NNDC	Resonance systematics for capture reactions using Machine Learning
Kolby Davis (Howard)	Prof. Alfred, *Dr. Chiu*	RHIC	Exploring the Nature of the Early Universe using the sPHENIX Experiment
Sixtus Kuudar (FAMU)	Prof. Scarlett, *Dr. Schenke*, Dr. Venugopalan	NP Theory	Exploring the origin of mean transverse momentum fluctuations in heavy ion collisions
Kurt Kennedy (Morgan St)	Prof. Rockward, *Dr. Ruan*, Dr. Eyser, Dr. Aschenauer	RHIC	Calibration and data analysis with STAR forward upgrades
Ambar Rodriguez-Alicea (UPR)	Prof. Palai, *Dr. Cultrera*, Dr. Rao	EIC	Numerical simulation of spin transport in advanced structures for spin polarized photoemission
Brynna Moran (Clarke Univ)	Prof. Harvey, *Prof. Deshpande*	EIC	A systematic study of novel rare isotope production at the Electron Ion Collider
Tiana Lynch (FAMU)	Prof. Scarlett, *Dr. Jha*, Dr. Tan, Dr. Titov	CSI	High-Performance and High-Throughput Computing In Nuclear Physics
Marcus McLaurin (Morgan St)	Prof. Rockward, *Dr. Vorabbi*	NNDC	Unresolved resonance probability distributions using Machine Learning