



# Welcome Remarks

**Haiyan Gao**  
**ALD, Nuclear and Particle Physics**

DOE Isotope Program Site Visit 1-day virtual visit of BLIP  
January 23, 2023





# Brookhaven Lab: A Multi-purpose Office of Science Lab

## Managed by Brookhaven Science Associates

- Partnership between Stony Brook University and Battelle Memorial Institute
- Core universities: Columbia, Cornell, Harvard, MIT, Princeton, Yale

## People

- 2,600 staff, 140 joint faculty, 500 students (FY21)
- 300 summer interns remotely (FY21); 110 in person FY22
- ~4,400 guests/users, including remote (FY21)
- >30,000 (K-12) students and educators annually (pre-COVID)
- 7 Nobel Prizes; 21 Laureates

## Budget

- FY21 costs: \$672 million
- Strongly aligned to SC (88%) and to DOE (93%)

## Regional Economic Impact

- Supports over 4,700 New York jobs
- ~\$400M NYS investment since 2013
- Long Island Rail Road Station near Discovery Park



# Our Science Initiatives are Transformational and Differentiate BNL

## Enduring Priorities

- Discovery Science and Technology
- Transformational User Facilities, including accelerator science and technology
- Applications of the Lab's capabilities to new opportunities, e.g., clean energy and climate and national security solutions; isotopes

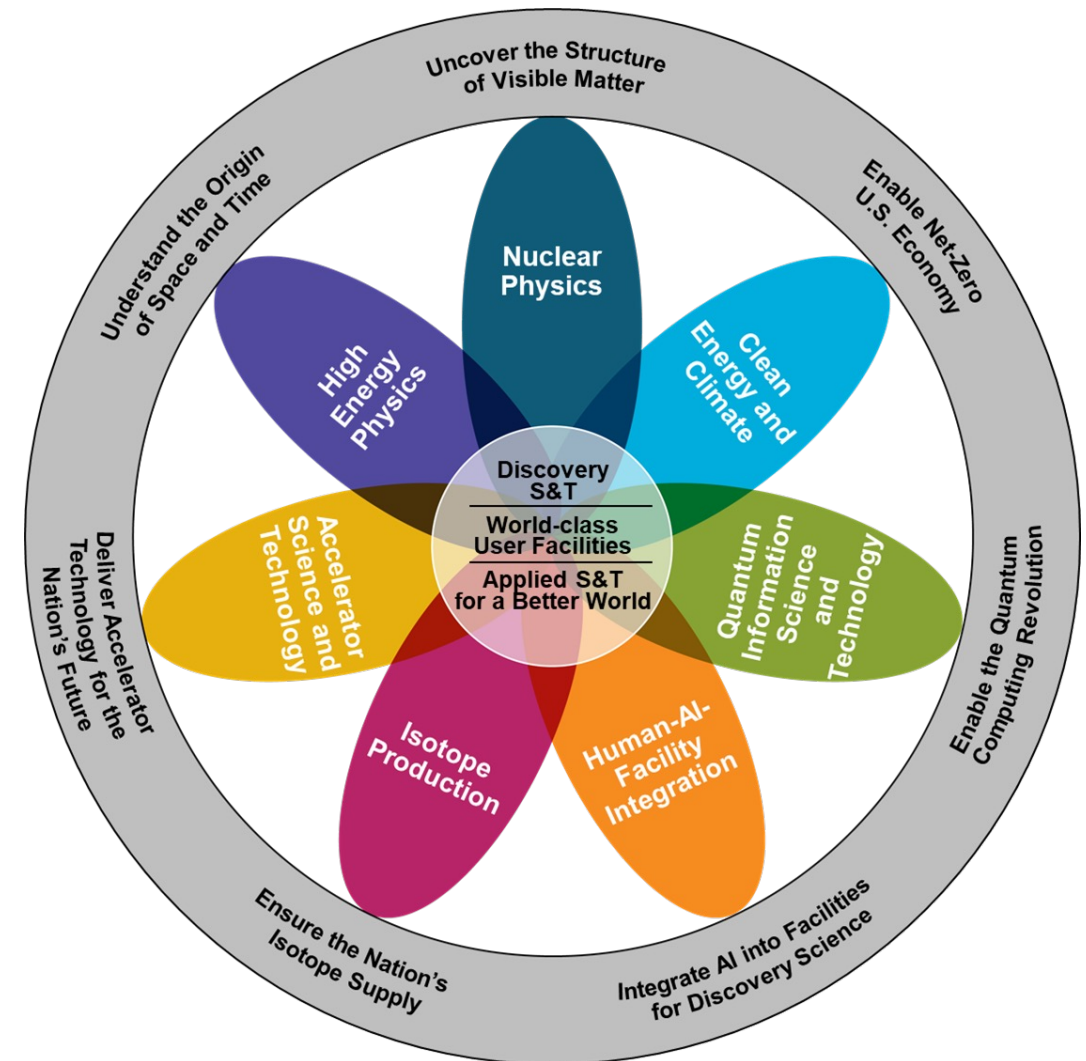
## Seven Scientific Initiatives Will Help Realize the Lab's Vision and Mission

- Align with the DOE Strategic Goals
- Build on and extend the Laboratory's strengths

## These initiatives and their synergies

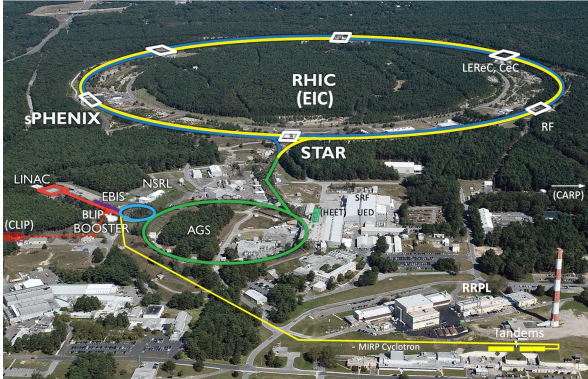
- Backed by our core capabilities
- Enhanced by DOE, national lab, NYS, university, industrial, and international partners

**Enable us to deliver on our mission**

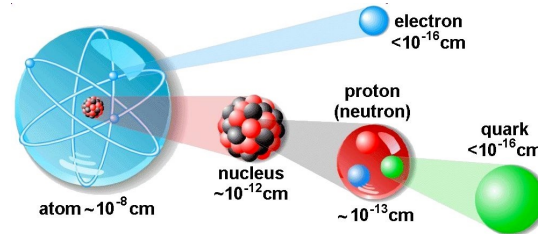




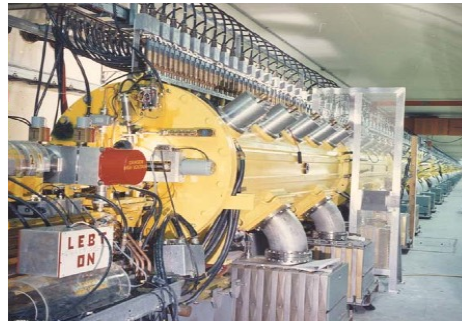
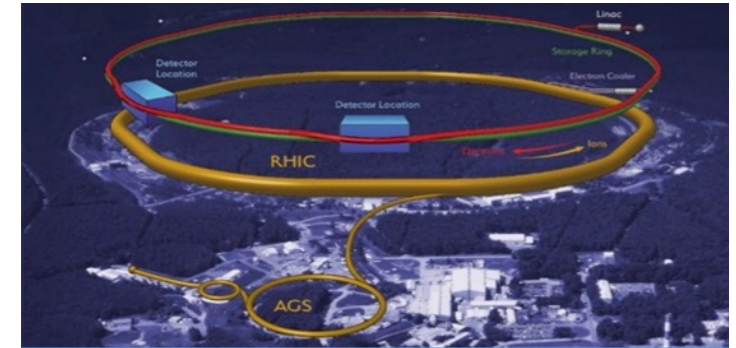
# Nuclear & Particle Physics at BNL



To understand sub-atomic world deeper and deeper



Electron-Ion Collider

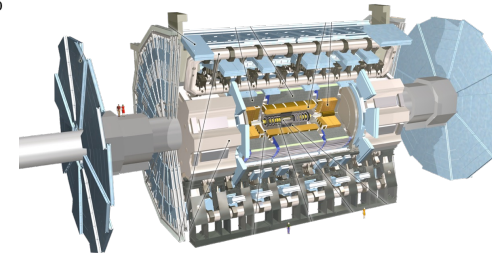
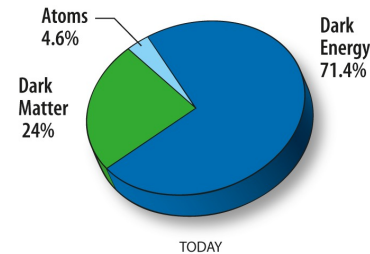


BLIP: Medical Isotopes

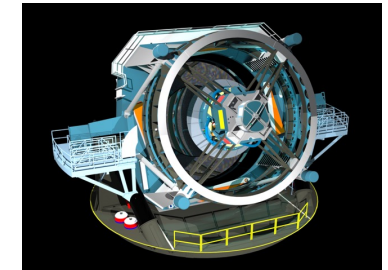


NASA Space Radiation Lab

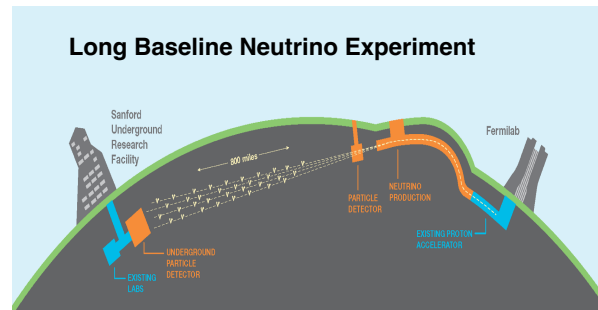
Develop unique technologies to answer fundamental questions in nature and applications of societal benefits



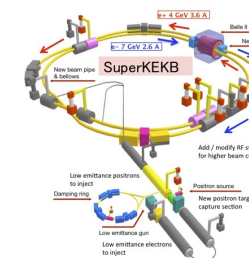
ATLAS @ LHC



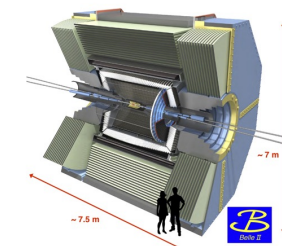
Rubin Observatory



High-Energy Theory, Nuclear Physics Theory  
Center for Fundamental Nuclear Science  
RIKEN-BNL Research Center



Belle II at SuperKEKB



# Safety

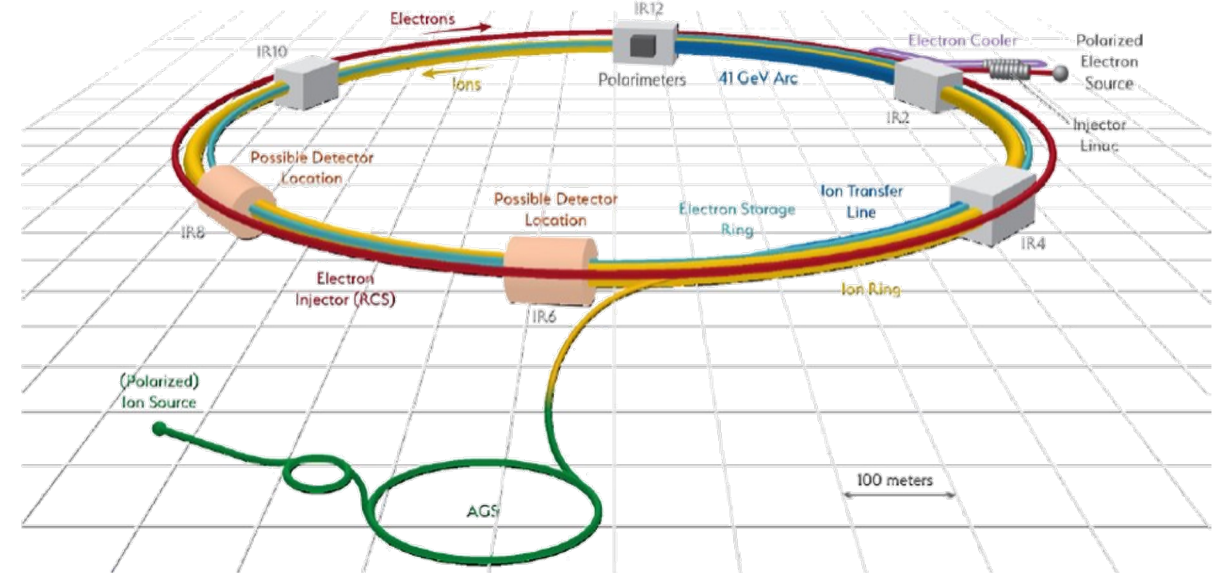
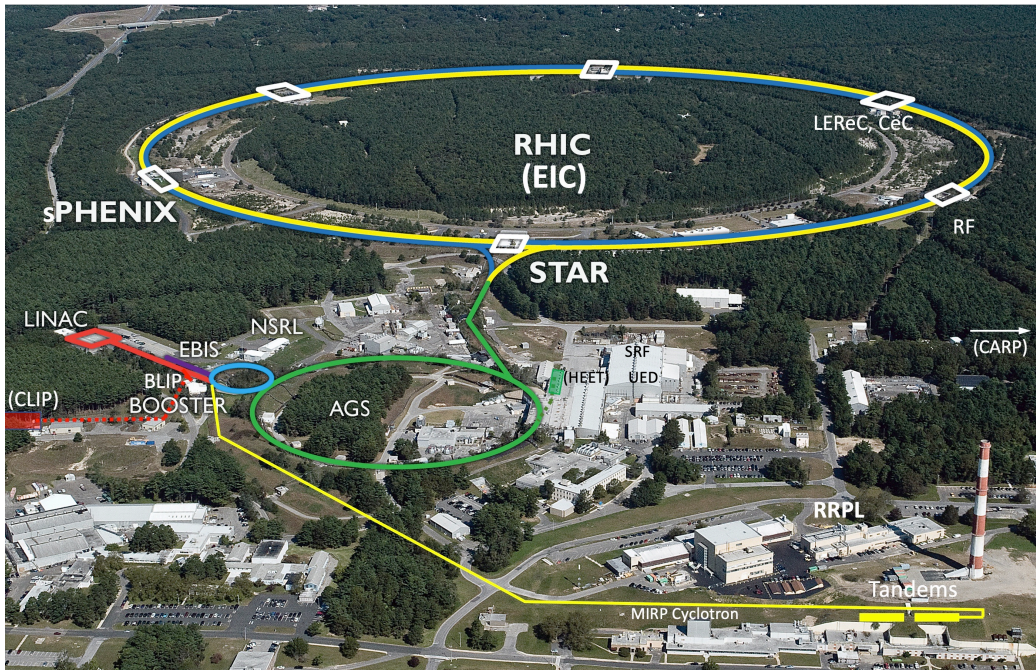
- Safety is a core value and a priority
- Continued work on Corrective Actions 54 of 92 Complete as of 12/20/2022
  - 17 of the remaining actions are required reviews or presentations to IRMC
- OPM Task force canceled over 338 procedures of 360 identified since March 2022 with 22 pending; 220 procedures inactive of 250 identified (canceled after a year if not used, otherwise revise prior to use)
- C-AD Hired Work Control Manager, Quality Engineer and additional procedure coordinator; lab level work planning coordinator onboard
- Managers safety walkthroughs in C-AD and ESH inspections for labs and offices in Physics are ongoing
- EEI Inspections nearly complete for Physics Department as planned
- Preparing for two Accelerator Readiness Reviews in the upcoming months
  - Cyclotron, Linac+Booster, and sPHENIX (USI, IRR)

# Recent DEI Initiatives and Activities

- Diversity, Equity, Inclusion and Accessibility (DEIA), a core value
- The NPP DEI Council has been leading many initiatives and activities. Recent activities include
  - Code of Conduct committee (preliminary report completed) (Cathy Cutler, co-chair)
  - Hiring practice committee (report completed)
- Traineeship and Summer School programs
  - Funded by the DOE-ONP NPT supported 10 URM students virtually and 6 onsite summer 2021; 8 URM students onsite summer 2022 (PI: Mickey Chiu)
  - NuSTEAM - Nuclear Science in Texas for the Enhancement and the Advancement of Minorities (strong NPP participation, 9 students onsite 2022 )
  - We delivered 16 summer lectures in 2021 and 15 lectures in 2022
  - Held summer school in nuclear and radiochemistry virtual in 2021, and onsite 2022
- African School of Physics
- NPP leadership visible in DEI efforts: NSBP annual conference; lectures at African School of Physics; POC for DOE FAIR program, DNP Allies Program
- Working on improving hiring more diverse workforce (data, outreach, best practices)
- Developing collaborations and/or bridge/joint faculty position(s) with HBCUs/MSIs (Howard, NC A&T & Morgan State, SUNY/Old Westbury) and working on an MOU with Morgan State U – a funded program development proposal in FY23 (PI: Hong Ma)
- BNL just became an APS Bridge Program Member with leading role by NPP/Physics Department

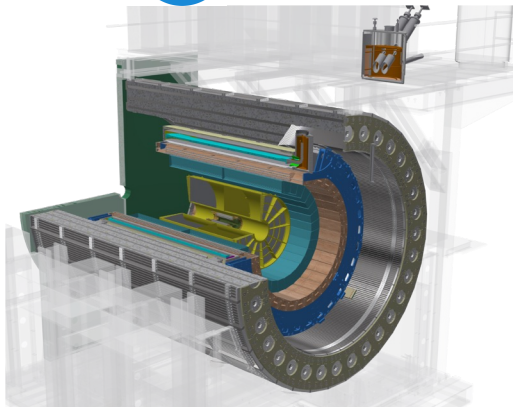


# RHIC to EIC, Isotope Program Strategic Vision

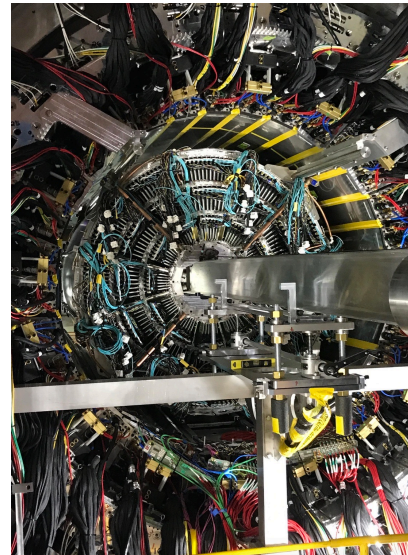


Brookhaven  
National Laboratory

Report # 07-01-2021



- sPHENIX will use energetic probes (jets, heavy quarks) to study quark-gluon plasma with unprecedented precision
- How the structureless "perfect" fluid emerges from the underlying interactions of quarks and gluons at high temperature



10-Year  
Strategic Vision  
for the BNL  
Isotope Program

2021

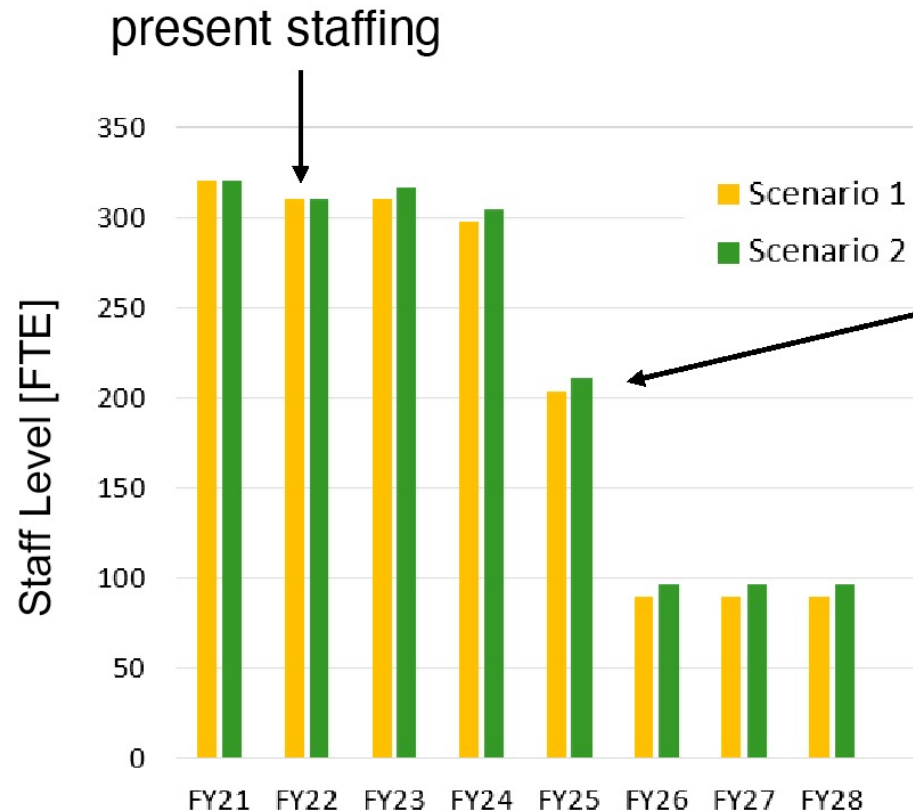
managed by Brookhaven Science Associates  
on behalf of the U.S. Department of Energy





# Staffing profile

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28
scenario 1	320	310	310	297	203	90	90	90
scenario 2	320	310	317	304	211	97	97	97



Last year of RHIC ops

Afterwards, Accelerator Complex (ion sources, LINAC and AGS Booster, AGS) maintained ready for return-to-operations for the EIC with continued improvements, upgrades, and R&D for future facilities and accelerator applications

Impact on IP program (post RHIC operations):  
~0.5-1 FTE MCR staff

**FY22 staffing profile similar to FY21 and dominated by redirects to the EIC**



# Awards and Recognitions

- Jasmine Hatcher-Lamarre, C-AD (2022 Long Island Business News Diversity in Business Award)
- Vanessa Sanders, C-AD (2021 Long Island Business News 40 under Forty Honoree)
- Cathy Cutler, 2022 BNL Science & Technology Award, Vice President-Elect, SNMMI



Isotope Program LDRD & PD Projects

Investment #	TITLE	PI	Prior Years	FY2022	FY2023	FY2024	FY2025
LDRD 21-006	In Vitro Analysis for Isotopes	Vanessa Sanders	180,000	200,000			
PD 19-001/PD 22-007	Novel Isotope Production Using the EBCO Cyclotron	Dohyun Kim	380,000	267,700			
PD21-004	Upgrades for the Isotope Production at BNL	Cathy Cutler	234,000	208,200			
LDRD 22-050	Trapping Noble Gases in Silicate Nanocages for Medical Isotopes, Nuclear Energy , and Nuclear Nonproliferation	Vanessa Sanders		349,000	361,000	367,000	
LDRD 23-021	Utilizing AI/ML and automation systems to inform and optimize isotope separations	Jasmine Hatcher-Lamarre			200,000	198,400	
LDRD 23-046	Examining Novel Isotope Production Pathway for a Medium to High Energy Cyclotron	Jasmine Hatcher-Lamarre			350,000	408,100	492,700
PD 22-006	Develop Plan for Nuclear Hot Cell Processing	Cathy Cutler		417,200	400,000		
			<b>794,000</b>	<b>1,442,100</b>	<b>1,311,000</b>	<b>973,500</b>	<b>492,700</b>