

All-Employee Meeting

Sam Aronson
August 2, 2012



U.S. DEPARTMENT OF
ENERGY

Office of
Science

10-Year Strategic Plan

2012-2021

*Full plan available at
www.bnl.gov/10yr-plan*

BROOKHAVEN
NATIONAL LABORATORY

a passion for discovery



U.S. DEPARTMENT OF
ENERGY

Office of
Science

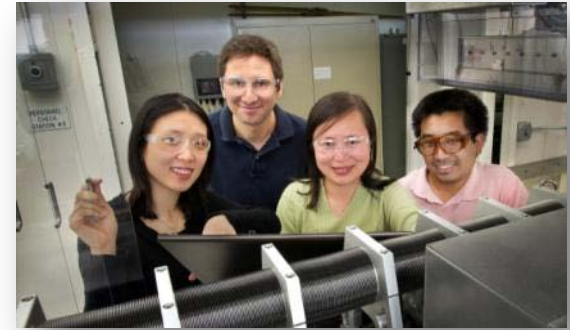
Our Plan for Robust Science

- Produce a world-class NSLS-II facility and carry out significant and well-executed first experiments
- Nuclear physics at BNL will remain second to none
- BNL's contribution to energy solutions will continue to grow both regionally and nationally
- BNL will continue to have leadership roles in particle physics both domestically and internationally
- Explore intriguing options for the application of BNL's accelerator technology
- Synthetic biology and data intensive computing are growing and exciting areas at BNL

We strive for operational excellence in
all of our work

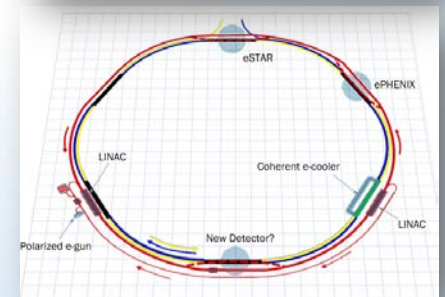
Completion of NSLS-II and Smooth Transition from NSLS is Our Top Priority

- NSLS-II more than 75% complete
- New light source will be 10,000 times brighter than NSLS
- Explore solutions to grand challenges in clean energy technologies and national energy security
- NSLS to NSLS-II transition
 - Early operations in 2014
 - ~30 beamlines by 2018
 - Will eventually serve 3,000-4,000 users/yr



Our Commitment to the Continued Operations of RHIC is Unwavering

- NRC report: “Spectacular” performance by the RHIC over past decade; critical future role
- RHIC Run 12: record p-p polarization and luminosity, first U-U and Cu-Au collisions (RHIC-II era is here!)
- Building support in the nuclear physics community for an electron ion collider
 - Developing new accelerator technologies, including an energy recovery LINAC
 - eRHIC is the most effective path to an electron-ion collider



Brookhaven Energy R&D: A Collaborative Approach



BNL Resources

CFN/Nanoscience



NSLS/NSLS-II



ISB-I



LISF



New York Blue

BNL
Research

NY State Consortia/Resources

ENERGY CHALLENGES: New York and Beyond

- Electric Systems
- Sustainable Fuels

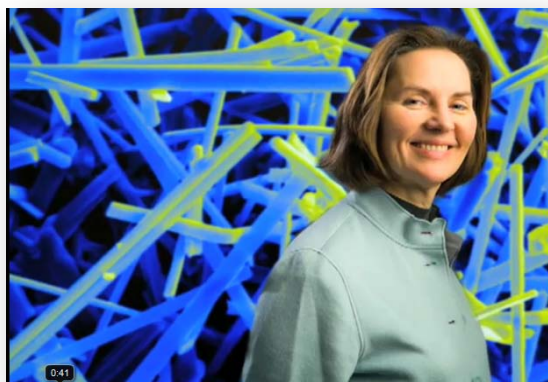
DOE ALIGNMENT/LEVERAGE

- DOE Priority Research Directions
- 4 Energy Frontier Research Centers

Collaborators/Joint Appointments



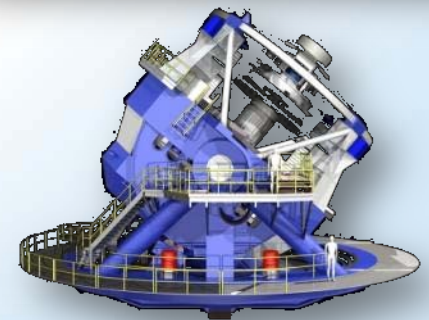
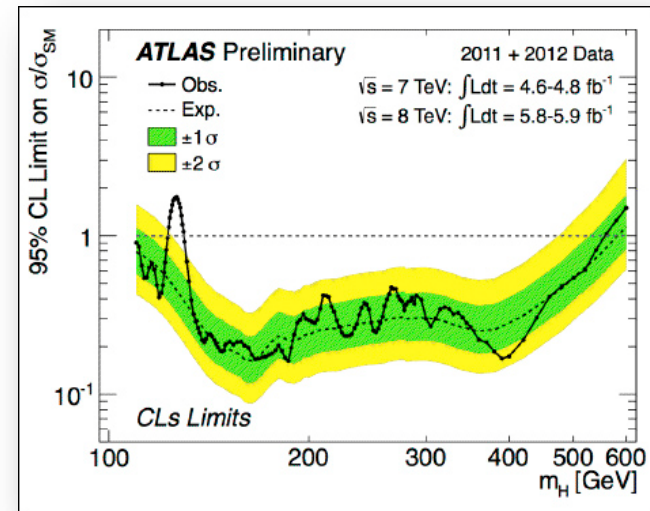
BNL/SBU Energy Storage Hub Proposal Addresses Fundamental Issues in Electrochemical Materials



- Focus on lifetime of electrochemical materials
- Driven by transportation & grid storage issues
- Strong BNL/SBU team in place
 - Distinguished leader: Esther Takeuchi
 - Leverages NSLS, NSLS-II, CFN, and Advanced Energy Center
- New York State Support
 - \$12.5M direct matching from NYS
 - Leverage NYS battery and grid investments
 - Support from Senator Schumer
 - Dedicated Building @ SBU: AERTC (new 49ksf, LEED Platinum laboratory space)

Physics of the Universe

- Intellectual and technical leadership in particle physics
- Three frontiers of particle physics:
 - **Energy** (ATLAS/LHC) – Secretary Chu’s award for RHIC-ATLAS Computing Facility, Higgs hunt
 - **Intensity** – Measurement at Daya Bay of the last unknown neutrino mixing angle
 - **Cosmology** – LSST camera received Critical Decision 1 approval from DOE
- Advanced accelerator R&D for a possible muon collider, developing record-breaking superconducting magnets



BNL Will Build a Leading Synthetic Biology Program

- Bioenergy is the long-term priority for our biosciences program
- Increasing plant oil production as a renewable resource for fuels and industrial feedstock
- Leverage BNL strengths: Plant biochemistry, Metabolic engineering, Physical biology, Computational biology and Nanoscience
- Continue development of BER programs: Tropics climate prediction, Atmospheric science, Radiotracers, Systems biology, K-base, Epigenetics, and Biology beamlines at NSLS-II



Accelerator Science & Technology

Supports Ongoing and Future Needs for BNL and the Broader Community

■ RHIC/eRHIC

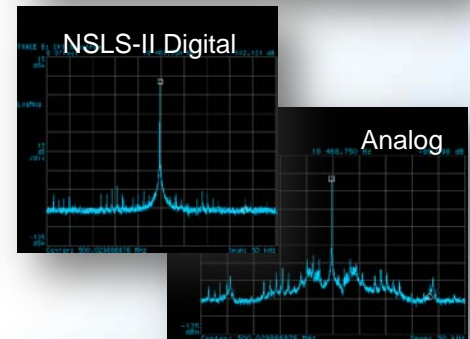
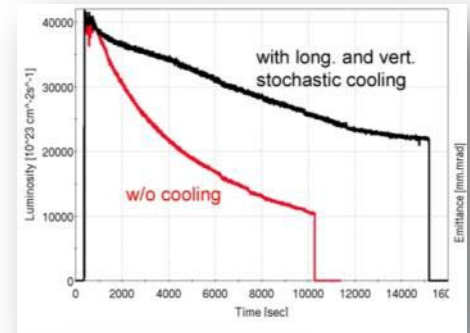
- Enables optimal RHIC operations
- Provides state-of-the-art technologies for eRHIC

■ NSLS-II

- Advanced beam position monitors
- High-precision magnet alignment
- Low-noise digital RF cavity controller

■ Societal impacts

- Grid-scale energy storage – ARPA-E grant
- CRADA to develop medical synchrotron for hadron cancer therapy



Computation

- Broaden impact as a leader in data-intensive high performance computing

Homeland/National Security

- Nuclear detectors for portal and cargo monitoring; Radiological Assistance Program; Urban dispersion of contaminants



Biomedical Imaging

- Apply radiochemistry and PET/MRI capabilities to biomedical challenges

Work for Others

- Our aspiration for WFO is 20% of the Lab's operating budget by 2020



RHIC Advocacy, Contingency Planning

- Current national budget constraints
 - Funding projections insufficient for the three existing and proposed facilities in the nuclear physics plan – RHIC, CEBAF, and FRIB
- DOE formed Tribble subpanel
 - Examine priorities in a constrained budget environment
 - Hearings in September and report due in January
- Advocating for RHIC
 - RHIC is highly productive, at the forefront of nuclear physics research, and provides a cost-effective path to a future facility (eRHIC)
 - Nuclear Physics: Retain U.S. scientific leadership
 - Making the case to NY congressional delegation, media, and others
- Contingency
 - Office of Science asked BNL to present contingency plans in case serious Nuclear Physics budget constraints in FY 2014-18 lead to early termination of RHIC operations

RHIC Contingency Plan

Guiding Principles (for April 2012 strategic planning retreat)

- Accelerate NSLS-II availability
- Preserve world-leading accelerator science and technology and cutting-edge research and development essential for future nuclear physics and basic energy sciences facilities
- Provide a vibrant nuclear physics research effort
- Promote “discovery to deployment” emphasis even more aggressively than in our principal plan
- Accelerate and expand materials science impact
- Accelerate synthetic biology and data-intensive computing efforts

Detailed plans and resource needs for accelerated growth being developed