PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

PREVIOUS ISSUES

August 2017

Contact: A. Donato

BNL WEBSITE | C-AD WEBSITE | ES&F WEBSITE | BERA | BNL CLASSIFIED ADS | INSIDE RHIC

Quote of the Month: "If you can't explain it simply, you don't understand it well enough." - Albert Einstein

A WORD FROM:

Business Ops



ES&F







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SPHENIX





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NOTE FROM OUR CHAIR: Thomas Roser

This month we hosted the first Electron Ion Collider collaboration meeting for both the JLab and BNL designs for such a future machine. There were about 100 participants, many more than anticipated. The participants came mostly from JLab and BNL but there were also participants from other labs in the U.S. and also from Europe.

The main focus of the meeting was to review the status of the designs and R&D efforts, but also to explore opportunities to increase collaboration, in particular between JLab and BNL. Whereas there are already established collaborations in areas that are common to the two designs there are also a number of R&D items that are unique to each design and where the other lab has the main technical expertise. A strengthened collaboration between the labs will also prepare the two labs to build this facility together.

Arrivals & Departures

VIEW UPCOMING CONFERENCE PROJECTIONS ***PROJECTIONS DUE ASAP***

OSafety Stats **DID YOU KNOW?? EVENTS/SEMINARS** October 19 - (Swimming Pool, Check out who received an employee Service Award this year! Collider-Accelerator Dept. employees who received a Service Award. Bldg. 478 | 11:30 am) BERA Healthfest 800 Yard Swim Check out who received an employee Spotlight Award this year! **October 19 - (Berkner Hall** Auditorium | 7 pm) Emergency **Preparedness: Severe Weather** Congratulations to our recent retirees: Paul Sparrow, Karen Cestra, Bob Van Wormer, Kerry Mirabella, Dana Beavis, Donna Training Grabowski and Bob Ernst! **October 21 - BERA Trip: Cloisters Museum & The Met** October 23 - (Gym | 11:30am) **BERA Healthfest Open House** Tours October 23 - (RHIC Ring Road | 12 pm) BERA Healthfest Bike **Ride at the RHIC Ring**



October 24 - (Bldg. 438 | 5 pm) BERA Healthfest Walk Down Brookhaven Ave.

October 24 - (Rec Hall, Bldg. 317 | 5pm) BERA Healthfest Table Tennis Tournament

October 25 - (RHIC Ring Road | 12 pm) BERA Healthfest Run at the RHIC Ring

October 26 - (Large Seminar Rm., Bldg. 510 | 4 pm) BWIS Speaker Event: Amazing Women and How They Got the Vote

October 27 - (Rec Hall, Bldg. 317 | 6 pm) Trunk of Treat! Please decorate the back of your car and have candy available for all the children. Light dinner and refreshments to be served.

November 10 - BERA Trip: Foxwoods Resort Casino

IN OTHER NEWS...

SNMMI's 63rd Annual Meeting Highlights History of FDG and Showcases New Research More than 5,700 physicians, technologists, scientists and exhibitors gathered at the Society of Nuclear Medicine and Molecular Imaging's 2016 Annual Meeting, held June 11-15 in San Diego, CA. This year's meeting included a celebration of the 40th anniversary of FDG. <u>Read more.</u>

Local Scientists Take Home First Place Honors in BNL Science Fair Budding young scientists filled the auditorium of the Suffolk County Legislature on Wednesday to



educate Legislators on their outstanding projects that won first place accolades at the year's Brookhaven National Laboratory's Science Fair. <u>Read more.</u>

New Graphene-Glass Combo Powers "Spontaneous" Solar Cell Brookhaven Does (Graphene) Windows. Apparently the Brookhaven solution to the graphene problem has been staring everybody in the face, ever since graphene was first discovered in 2004: ordinary glass window. <u>Read</u> more.

Research Teams Use DNA to Make 3-D Nanoparticle Structures with High Precision DNA strands anchored to the surface of nanoparticles allow researchers to assemble the particles into three-dimensional crystalline lattices. Such control allows researchers to make new materials



with desirable properties. <u>Read</u> more.

Farmingdale takes first in BNL High School Science Bowl Farmingdale High School students have one contest down to a science. Read more.

New cathode material stops batteries turning crusty with age Scientists at three US Department of Energy (DOE) national laboratories have discovered how to keep a promising new type of lithium ion battery cathode from developing a crusty coating that degrades its performance. Read more,

RHIC Particle Smashups Find that Shape Matters Scientists colliding football and sphere-shaped ions discover evidence supporting a paradigm shift in the birth of the quark-gluon plasma. Read more.

Two American Physics Labs Are Vying for a Billion Dollar Particle Accelerator Two labs are vying for government



funding to host a billion-dollar atom smasher, and the battle is getting political. <u>Read more.</u>

Neutrinos Change Their Flavor and Snag Another Nobel Prize Early this morning the world learned that the 2015 Nobel Prize in Physics has been awarded to Takaaki Kajita and Arthur B. McDonald for discovering that neutrinos can change from one type to another. <u>Read more.</u>

World's largest atom smashers create world's smallest droplets How long can a droplet shrink and remain a liquid? Read more.

'Inflatable Dark Matter' Could Explain Why We See Less Than Many Theories Predict Many wonderful theories that explain the evolution of the universe fail because they predict more dark matter than is actually out there. Now a new paper proposes one event in the early universe that would reduce the amount of dark matter in all the theories. <u>Read</u> more.



Ion collider produces droplets of primordial goo The Relativistic Heavy Ion Collider just spit out tiny droplets of a liquid researchers say resembles the seeds of the cosmos, primordial goo created by the Big Bang, which existed on briefly before cooling the matter that helped birth stars, galaxies and planets. <u>Read more.</u>

Brookhaven National Laboratory projects are up for awards Four projects developed at BNL have been nominated as finalists for awards to be presented this year by a national magazine. Read more.

Scientists Create Primordial 'Perfect Liquid' in Lab The BNL's Relativistic Heavy Ion Collider smashed together large nuclei at nearly the speed of light to recreate the fundamental particles in the primordial soup present during the earliest days of the universe. Read more.

World's most powerful digital camera being built by US Department of Energy The US Department of Energy is building a digital camera that puts your camera to shame. Read more.











We wish you health and happiness in the next chapter as retirees!



The morning moon and Venus, S. Bellavia



Bubble Nebula, S. Bellavia

WHAT'S GOING ON IN OUR NEIGHBORHOOD?

Interested in Cycling?

http://www.bicyclelongisland.org/majoride.htm http://www.cyclotour.com/events.htm

Interested in Running or Walking?

Glow Run - Oct 20 in Center Moriches

Comeback Trail 5K - Oct 21 in Wantagh

Run for the Ridley - Oct 22 in Riverhead

Commack Coalition of Caring 5K - Oct 28 in Commack

Sleepy Hollow 5K- Oct 29 in Massapequa Park

DAY AT THE VINEYARDS...

Duckwalk North - SOUTHOLD - Music on Saturdays (4-6pm)

Castello di Borghese Vineyard & Winery - CUTCHOGUE - Vineyard Tours & Wine Tastings Every Thursday & Sunday at 1pm & FREE Jazz Every Saturday (2-4p) with Marguerite Volonts

Jamesport Vineyards - JAMESPORT -Live Music from 1-4pm every Fri, Sat & Sun

Martha Clara Vineyards -RIVERHEAD - Live Music every weekend

Stony Brook Events:

Yoga Classes - October 5 - 26 (6:45-7:45p) at the Education and Cultural Center

Optimizing Your Nutrition - October 21 (11a-3p) at the Education and Cultural Center

Walk for Beauty - October 22 (8:30a) at the Stony Brook Village Center. Help fight for a cure!

27th Annual Scarecrow Competition - September 29 - October 31 - Come have fun creating a scarecrow or just voting for your favorites!

Halloween Festival - October 31 (2-6p) at the Stony Brook Village Center. Trick or treat in the shops, pumpkin painting, scarecrow competition, kids crafts, games and more!

Port Jefferson Events:

Farmers Market - Every Sunday through October (10a - 2p) at the Village Center. Purchase local produce, honey, bread and baked goods, seafood, international specialties, plants and flower bouquets.

A Taste of Port Jefferson - October 21 (6p) at the Village Center. Come and join us for the taste at Port Jefferson, many different special restaurants to taste including gourmet cocktails, wine and craft beers, plus live entertainment!

8th Annual Harvest Festival - October 29 (12 - 5p) at the Village Center. Chowder crawl, farmer's market, costume dog parade, kids crafts, scarecrow competition, marshmallow roasting in the town square and more!

Check out Erik Forsyth's Travels:



HTTP://WWW.YACHTFIONA.COM

Palmer Vineyards - RIVERHEAD - Live Music every Sat (12-4).

Pindar Vineyards - PECONIC - Live Music Every Saturday (1-5pm)

Baiting Hollow Farm Vineyard -BAITING HOLLOW - Music every Sat & Sun from (2-6)

Paumanok Vineyards -RIVERHEAD - Fresh, Local Oysters (2-5pm) every Sat & Sun starting Memorial Day through September

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A WORD FROM:









Operations



MIRP sPHENIX



September 30 marked the end of fiscal year 2017, a year in which C-AD costs totaled \$175 million! While the bulk of these costs are related to the RHIC program, other operating programs - MIRP, NSRL, and ATF are also healthy contributors. Thank you to everyone who assisted in our efforts to control costs as we closed out FY2017. And thanks for your continued cooperation as we move into the new year. FY2018 begins on a continuing resolution, meaning our DOE programs will generally be funded incrementally at levels that are flat with the previous fiscal year. Please continue to pay close attention to your spending.

There have been some recent staffing changes in the C-AD/SMD Business Operations Group, including Karen Cestra's retirement. Our group can assist you with a variety of matters, including budgets, financial reports, credit card questions, invoices, timecards, and web reqs. For reference, here's a list of our staff with their primary responsibilities. Please feel free to reach out to me or any member of the group for any questions you may have.

Henry Biedenkapp, x2631 - analyst for LEReC and other AIP, Capital, Construction, SPP Projects and Tandem Users Nancy Boyle, x5290 - analyst for Superconducting Magnet Division and NSRL Steve Bubka, x5560 - web reqs, work orders, RFQ's

Arrivals & Departures

OSafety Stats

Matt Galea, x8207 - analyst for Medical Isotope Program
Ann Lamberti, 7611 - group leader for NPP Procurement and Property Management
Stephanie LaMontagne, x7141 - Business Operations Manager for NPP Directorate
Cris Manalo, x4150 - analyst for RHIC Operations, Nuclear Physics, R&D and C-AD labor forecasting
Colleen Michael, x4919 - timecards
Sue Pankowski, x7270 - group leader for C-AD/SMD Budget and Accounting
April Spencer, x8732 - property management
Millie Wiener, 7245 - analyst for ATF/ATF II and all HEP programs within the NPP Directorate

NOTE FROM BUSINESS OPERATIONS: Sue Pankowski

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NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer

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Business Ops





eRHIC R&D



MIRP

SPHENIX



The RHIC run for next year now has a new challenge: STAR requested to switch between Zr+Zr and Ru+Ru from store-to-store. While we are used to switching the beam species in the injector chain for asymmetric species combinations, the RHIC configuration in a given mode was always stable so far. STAR would like to switch the species from store to store to minimize systematic errors in the comparison of Zr+Zr and Ru+Ru collisions. Both ions have the same number of nucleons, and will create the same Quark Gluon Plasma, but Zr had a charge of 40 and Ru has a charge of 44. This creates a different magnetic field in the collisions, and this is the effect STAR wants to study.

On 25-27 October 2017 we will have the annual C-AD Machine Advisory Committee, and this year's topic will be beam cooling. Stochastic cooling is now a central feature in heavy ion collisions, and the LEReC project installs a 2 MeV bunched beam electron cooler for the Beam Energy Scan II. In addition, the Coherent electron Cooling Proof-of-Principle (CeC PoP) is under way to test a novel cooling scheme that combines elements of electron and stochastic cooling, and would be suitable for future machines such as eRHIC. 14-15 November 2017 will be the next LEReC project review.

Arrivals & Departures

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Business Ops

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NOTE FROM OPERATIONS: Paul Sampson

ES&F





ATF

MIRP

SPHENIX

Shutdown for LINAC, AGS and RHIC continues. Progress is being made on all major projects. EBIS, Tandem and the Booster are running for NSRL experiments.

The major effort is focused on installation and construction of LEReC in the 2 o'clock area. Shielding will remain down through December, when conditioning of high voltage components is scheduled to begin. In addition, Diode replacement for the D6 dipole sector 7 yellow is progressing on schedule, with completion expected in November. Also, work on the 9MHz RF cavities in sectors 3&4 continues, as does support for STAR and PHENIX in the experimental halls. In building 912, the LEReC booster cavity tests are in progress at the RF testing facility (formerly ERL), with installation in the tunnel pending successful completion.

Startup of the pre-injectors for NSRL was successfully completed late last month and science is underway. The Booster is providing ions from EBIS and protons from Tandem for the experiments as necessary.

In LINAC, chillers have been secured for several weeks in order to complete an upgrade to the MCC. Replacement of air handler 4, maintenance and RF upgrades are also progressing on schedule. LINAC will begin start up and checkout in November in preparation for Beam in December and the BLIP run in January.

Arrivals & Departures

Schedules for major works, testing, interruptions and other items continue to be developed and can be viewed on the "RHIC Broadcast" page.

To view a list of approved work for the Shutdown or to review past results, go to the Job Request System and select the appropriate date. This link is behind the firewall and requires privileges to view.

Safety Stats For weekly schedule updates see: This Week, which can be viewed by all.

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Business Ops	Link to: ATF Newsletter
Accelerator	NOTE FROM OUR ACCELERATOR TEST FACILITY: Mark Palmer
ES&F eRHIC R&D Operations ATF MIRP sPHENIX	No comment at the time of this publication.
Safety Stats	

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NOTE FROM OUR MEDICAL ISOTOPE RESEARCH & PRODUCTION PROGRAM: Cathy Cutler

A WORD FROM:

Business Ops







eRHIC R&D



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Arrivals & Departures



As mentioned in last month's Particle Post, MIRP was audited by Rubigen on October 4th. This is a company seeking marketing authorization in Europe to supply Sr-82/Rb-82 generators. If they receive it they will be the sole European supplier of these generators. They were pleased with the cleanliness of the facilities and the hot cells, the lay out of the procedures and the professionalism of the group. We want to thank everyone who helped with this audit including the facilities group that ensured the building was cleaned, the lawn was mowed and unwanted pests were dealt with. We are planning for another audit on November 6th and 7th from Draximage. They have been to BNL in the past and this will be a more significant audit. Draximage received FDA approval last year to supply Sr-82/Rb-82 generators.

OSafety Stats

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NOTE FROM SPHENIX: Ed O'Brien

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When a large aperture superconducting solenoid became available after the decommissioning of the BaBar experiment at SLAC, BNL acted quickly to obtain DOE permission to transfer the magnet to Brookhaven for use in a future experiment at RHIC. Months of careful planning for the shipping of the magnet across the country reached a successful conclusion with the arrival of the magnet at BNL in February 2015. DOE encourages the exchange of valuable, hard-to-reproduce research equipment between National Labs for the benefit of ongoing or future research projects. Just as the shipment of the BNL g-2 ring to Fermilab in 2013 provided FNAL with the foundation for the next generation g-2 experiment, the BaBar solenoid traveled from SLAC to BNL to provide a key multimillion dollar component for the sPHENIX experiment, and also give to Brookhaven a device that could be very handy for a future EIC experiment.

Last year, a team of BNL technicians, engineers and scientists from C-AD, Physics and the Superconducting Magnet Division (SMD) worked together to cool down the former BaBar solenoid to liquid helium temperatures and carry out a 2% power test. The magnet passed all tests and in the process the BNL team was able to repair a few helium leaks that had been troublesome to SLAC. The next step was the real challenge, a full power test. This required BNL to design and build a full steel enclosure, a magnet flux

return, for the magnet. The flux return had to meet a number of challenging criteria including having a size and shape close enough to the actual sPHENIX flux return that the magnetic forces that the steel imparts to the solenoid's coil would closely match those from the eventual sPHENIX flux-return. In addition we asked that the flux return be built from as much pre-existing magnet-steel as possible to save money. It turns out that much of the steel came from the remains of the flux-return from the Arrivals & Departures Multi-Particle Spectrometer (MPS) magnet which CAD personnel had wisely saved many years ago. There was another key ingredient too. Every large solenoid has a cryogenic chimney through which the liquid helium, electric power and magnet sensors pass. We needed one that was 1.5 meters longer than the one that came with the SLAC magnet. Fortunately the Magnet Division engineers did a great job designing the extension that the SMD technicians have assembled. It is all coming together now on the floor of Building 912. We expect cool down to start within the next few weeks followed by the full power test one month later. Once the test is completed we expect that it will be another fine example of the successful outcomes due to teamwork between various BNL Departments and Divisions.

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Accelerator	ARRIVALS: Welcome!
ES&F	Jun Ma - CeC, eRHIC Research & Development Matthew Tomko - Software, Accelerator Division
eRHIC R&D Operations	
ATF	DEPARTURES: Farewell, you will surely be missed
MIRP	Chen Xu Joseph Curley
5PHENIX	Kerry Mirabella Dana Beavis
	Paul Sparrow Bob Van Wormer
Arrivals & Departures	Gary Whitbeck Stephen Orkiszewski
	Ryan Benante Karen Cestra
Safety Stats	Donna Grabowski Yongfeng Gao
	Guest Notices:



