

SEP '16
ISSUE

PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

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August 2016

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Quote of the Month: "Science is a way of thinking much more than it is a body of knowledge." - Carl Sagan

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NOTE FROM OUR CHAIR: Thomas Roser

The 912 experimental hall for the B and C production targets of the AGS fixed target program housed many groundbreaking particle physics experiments such as E787/949, that discovered the extremely rare decay of a positive kaon to a positive pion and two neutrinos. The experimental hall has been cleaned out almost completely and is now being used for the superconducting rf (SRF) development area with a vertical test facility and a class 10 clean room.

The main part of the 912 hall is being prepared as the future location of an upgraded Accelerator Test Facility (ATF II). ATF is presently located, in very cramped quarters, in building 820. ATF operation in 820 will continue through 2018 to provide facilities for accelerator physics experiments while another test facility (FACET at SLAC) is shutdown for their upgrade. In the meantime, however, a first experimental facility, UED or Ultrafast Electron Diffraction, has started operation and construction of a powerful CO2 laser is progressing in 912. The CO2 laser will be the core part of the future upgraded ATF in 912.

[VIEW UPCOMING CONFERENCE PROJECTIONS](#)

PROJECTIONS DUE ASAP

DID YOU KNOW??

Check out who received an employee Service Award this year! Collider-Accelerator Dept. employees who received a [Service Award](#).

Check out who received an employee [Spotlight Award](#) this year!

**Stephanie LaMontagne's daughter, Nicole, married Matthew on September 1st!
Congratulations to the newlyweds and their families!**

EVENTS/SEMINARS

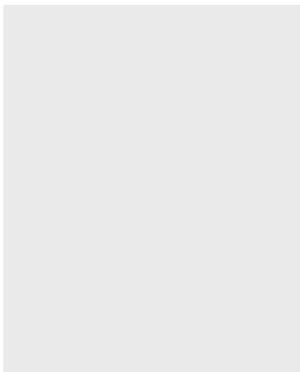
**September 20 - (Brookhaven Center | 12 pm)
Health Promotion Program Lecture**

**September 21 - (Recreation Hall, Bldg. 317 | 10 am)
Hospitality Coffee & Playgroup Event**

**September 21 - (Huntington Cinema Arts Centre | 7:30 pm)
Science on Screen: BNL Presents 'The Martian' Film and Discussion**

**September 21 & 28 - (Small Seminar Room, Bldg. 510 | 2 pm)
Joint YTTP/HET Seminar**

**September 22 - (Large Seminar Room, Bldg. 510 | 4:30 pm)
Brookhaven Women in Science Event: "LIGO and the Beginning of Gravitational Wave Astronomy"**



Enjoy some beautiful astrophotography from Steve Bellavia's trip to Cherry Springs State Park, PA!

September 27 - (ITD Seminar Room, Bldg. 515 | 12 pm) BERA Maker Club and Amateur Radio Club

September 29 & 30 - (Berkner Hall, 11 am - 1:30 pm) BVA/AAP Fundraiser: Fall Plant Sale

October 2 - BERA Trip: Renaissance Faire

October 8 - BERA Trip: Starfleet Academy Experience & The Intrepid

*****Last day to buy tickets: September 23rd!*****

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. [Read more.](#)

Local Scientists Take Home First Place Honors in BNL Science Fair

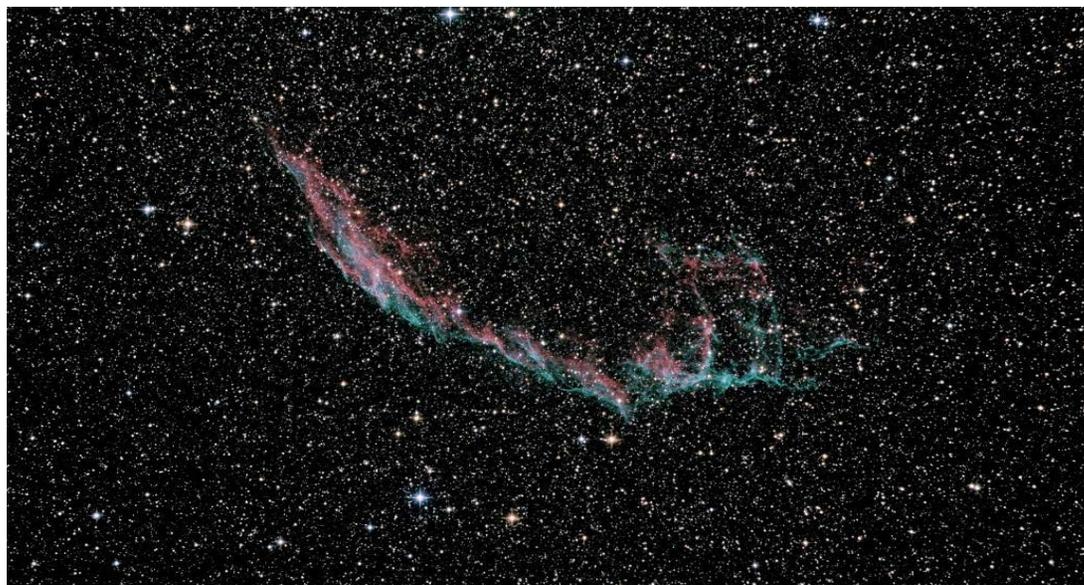
Budding young scientists filled the auditorium of the Suffolk County Legislature on Wednesday to educate Legislators on their outstanding projects that won first place accolades at the year's Brookhaven National Laboratory's Science Fair. [Read more.](#)

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. [Read 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



The Easter Veil Nebula, NGC 6992



The Witch's Broom, NGC 6960

particles into three-dimensional crystalline lattices. Such control allows researchers to make new materials with desirable properties. [Read 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. [Read more.](#)

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. [Read more.](#)

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



The Trifid and Lagoon Nebulae, M20 and M8

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. [Read 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. [Read more.](#)

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.](#)



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?

Run/Walk to Break the Silence on Ovarian Cancer - September 24 in North Babylon

Runner's Edge Whisper Run - September 24 in East Islip

15K Run to Benefit Rocketship Park - October 9 at the Port Jeff Brewery in Port Jeff Village

...Check out the [LI Running Calendar](#) for more!

For the Kids:

Youth Programs - Port Jefferson Village Recreation Department presents a number of youth programs and summer camps your child can enjoy this summer. Find more information [here](#).

Stony Brook Events:

4th Annual LEGO Building Contest & Exhibit - September 17 - October 16 (10 am - 5 pm) at the Educational and Cultural Center. Come see all the amazing creations on display and be sure to vote for your fan favorite with your paid admission ballot! Exhibit admission is \$4 for adults and \$2 for children.

Discover Wetlands Cruise! - Take the pontoon boat "Discovery" on a 1.5 hour tour through an 88-acre wetlands preserve. A naturalist is onboard to describe the wildlife and flora that you'll see.

Port Jefferson Events:

Brazilian Guitar Quartet - Free Classical Music Series - October 1 (7:30 pm - 9 pm) in the Village Center

Farmers Market - Every Sunday through November (9a - 2p) at the Village Center. Purchase local produce, honey, bread and baked goods, seafood, international specialties, plants and flower bouquets.

Check out Erik Forsyth's Travels:

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

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



[HTTP://WWW.YACHTFIONA.COM](http://www.yachtfiona.com)

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NOTE FROM BUSINESS OPERATIONS: Sue Pankowski



The C-AD Business Operations Group is preparing for the 2016 fiscal year end close that takes place on September 30. On that date, the annual costs we report to the Dept. of Energy for FY2016 should reflect the full value of all effort performed, as well as the value of all goods and services received. You can assist with a graceful year end close as follows:

- Complete your September timecard with your best estimate of productive and non-productive hours as soon as possible. You should update your time as needed, and then submit your timecards by the appropriate deadline. As always, you should also ensure that you are using the appropriate project numbers.
- If you are a credit card holder, enter the project numbers for purchases to be charged to projects other than your default project quickly. The cutoff for all changes to credit card project/activity changes is Friday, September 23.
- If you are a requestor on a high-value procurement and anticipate a material delivery in September, please keep Ann Lamberti in the loop on any changes in the delivery schedule.
- If you are a technical representative on a construction, service, or maintenance contract, Ann Lamberti and Karen Cestra may need your assistance in obtaining and/or evaluating the vendor's estimated level of effort through September 30. Please address these requests for assistance promptly.

It appears that FY2017 will be with a Continuing Resolution - meaning the actual fiscal year budget is not determined and our DOE programs would be funded at FY2016 levels. With that in mind, your attention at this time is critical - remember to make every purchase count, buying only what is necessary for critical work scope.

Thanks in advance for your cooperation.

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NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer



Last month the BLIP Raster project had its close-out review by DOE. The project was completed 4 months ahead of an already accelerated schedule, used only 14% of the contingency, and delivered the performance expected. Congratulations to the project manager Rob Michnoff and everyone on his team for making this an exemplary project.

Last month was also the bi-annual Science and Technology Review of the RHIC program by DOE. The highly successful RHIC operation of the last two years was noted, which produced a number of luminosity records and demonstrated the unparalleled collider flexibility with numerous species combinations and collision energies. Also noted were the new challenges emerging for machine and experimental protection with the ever-increasing beam intensity and luminosity, such as the quench protection diode repair last run. Some upgrades will be required for the future operation with sPHENIX.

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NOTE FROM OUR EXPERIMENTAL SUPPORT & FACILITIES DIVISION: Bill Christie



The work on the two RHIC Experiments progressed well through the end of August and up through the first half of September.

For the PHENIX detector the estimated ~18 month effort to disassemble and re-purpose (re-use, return, or recycle) the detector has continued. At this point all of the racks, and the platform levels that supported the racks, have been removed from the East carriage. A RICH detector module was a recent large piece of this East carriage assembly that has been removed from the structure and moved over to a location in Bldg 912, where some parts will be salvaged. Next up is the removal of a number of Electromagnetic Calorimeter modules from the East carriage, some fraction of which will be stored for possible future use by STAR and sPHENIX detector. Also expected soon is the removal of the PHENIX experiments vacuum pipe, for storage and later reuse in the sPHENIX detector, and its replacement by a large diameter vacuum pipe which will be used for the next three to four years.

For STAR, from the start of the maintenance shutdown back in late June through the first half of September, the shutdown schedule and plan have been held and followed as planned. After the removal of the inner detector Carbon support cylinder in August, which includes the small diameter experimental vacuum pipe, the PXL silicon detector support and installation structures, and the Silicon strip (SSD) and Silicon pixel-strip (IST) detectors, we installed the original inner carbon support structure and the original large diameter (8 cm) experimental beam pipe. STAR was rolled back into the interaction region, from the Assembly building, on September 8th, and is now back online with water cooling and power. The reconnection of external cabling, and various other sub-system utilities continues.

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NOTE FROM OUR ERHIC R&D PROGRAM: Ferdinand Willeke



Input forthcoming

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NOTE FROM OPERATIONS: Paul Sampson



Shutdown projects at RHIC and the AGS continue throughout September. Major effort in RHIC is focused in the 2 o'clock region on construction and installation of LEReC and CeC PoP facilities and in the 4 o'clock area on 9 MHz and other RF systems. Work in the assembly area of 1006 for STAR will conclude this month and the detector is scheduled to be rolled back into the tunnel early this month. Construction at PHENIX continues on schedule.

In the AGS, focus is on the cold snake repair and MG set maintenance. The Booster will start up this month for NASA and NSRL. Commissioning of the new Access Controls System is nearing completion.

LINAC maintenance and shutdown work is underway. Repairs of Mods 4 and 6 and major maintenance of the tank cooling system are nearing completion. Installation of the new low level RF system and modification of Mod 5 for increased pulse width continues on schedule. Both of these systems will be tested and commissioned this run.

EBIS and Tandem are completing maintenance and will continue to run periodically during the shutdown.

The "[RHIC Broadcast](#)" link displays the latest schedules for testing, power disruptions, outages and daily schedules.

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.

For weekly schedule updates see: [This Week](#), which can be viewed by all.

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Link to: [ATF Newsletter](#)

NOTE FROM OUR ACCELERATOR TEST FACILITY: Mark Palmer



Accelerator Test Facility Update:

Over the last month, 4 experimental teams have been active at the ATF. These groups have carried out experiments on Inverse Compton Scattering, Dielectric Wakefield generation, and self-channeling of high intensity IR laser beams in air. In addition, experimental setup for a new round of Laser Wakefield Acceleration studies has been underway. We are looking forward to experimental updates from these, and the other experiments conducted over the last year, at our annual [User's Meeting](#), which will be held October 26-27 in Physics, Building 510.

On the facilities front, our new x-band deflector cavity has been conditioned and is now ready to move onto the accelerator beam line at Building 820 - thanks to the efforts of Marc Montemagno and his team. Several experiments are looking forward to the availability of this new diagnostic tool. In Building 912, the upgrades of the UED facility, which were described last month, have now provided a much more stable operating environment for the important device. A visit to the UED from DOE-BES Program Managers Helen Kerch and Jane Zhu went very well on September 1st. In the meantime, the ATF-II Project Team has been busily preparing a fully updated project plan, which we expect will be ready for a full review in early November. All in all, it has been a busy and productive month at the ATF.

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



This past year the MIRP with the support of many in C-AD made a number of changes to their routine production targets RbCl for Sr production due to installation of the Raster. Previously only a focused Gaussian beam could be delivered to the BLIP targets. This limited the current that could be delivered to ensure target survival. The limit was 115 μ A. The raster installation at the beginning of the year enabled us to paint the target with the beam and deliver routinely up to 165 μ A resulting in a 35% increase in Sr-82 production yields. Additionally, it enabled better control of the beam exiting the RbCl targets thus enhancing yields and minimizing impurities of downstream targets. In addition to routine production of Sr-82 MIRP utilized beams to irradiate a number of research targets. The findings were presented at the recent Workshop for Target and Target Chemistry (WTTC16) hosted by Los Alamos National Laboratory (LANL) in Santa Fe, New Mexico. BNL has a strong presence at the meeting starting off with a plenary lecture given by Emeritus scientist Dr. David Schyler presenting an overview of the chemistry and physics that occur inside accelerator targets that affect the final chemical form of the radioisotope after irradiation. The targetry meeting has been a forum where scientists around the world working on isotope production could meet and informally discuss successes and problems they were encountering and seek guidance. Over the years as isotope production has increased the meeting has become larger and teaching the next generation of scientists has taken on more importance. More formal presentations have evolved, however, the informal nature has continued enabling young researchers to gain from the experience of experts in the field. Additionally several abstracts were selected for oral presentation on research production utilizing novel targetry. Among those were an update on collaborative work with LANL on Ti-44 production to enable a generator of a positron emitter of Sc-44 for PET imaging of peptides, BNL efforts to produce the medical isotopes As-72 for PET imaging and Re-186 and Re-189 for targeted therapy. The BNL raster upgrade was highlighted by Dr. Mausner including discussion of hardware and thermal analysis of the RbCl targets for optimized production of Sr-82. Additionally several talks were presented by collaborators on the tri-lab effort of Ac-225. Attached are the [abstracts](#) that were submitted and accepted for the meeting. The MIRP would like to thank the BLIP radiation safety review committee whose members, particularly Chris Cullen and Dana Beavis aided with the development, fabrication, approval, and irradiation of these targets.

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ARRIVALS: Welcome!

Omer Rahman - eRHIC R&D

Matthew Musgrave - Preinjector Systems, Accelerator Division

DEPARTURES: Farewell, you will surely be missed..

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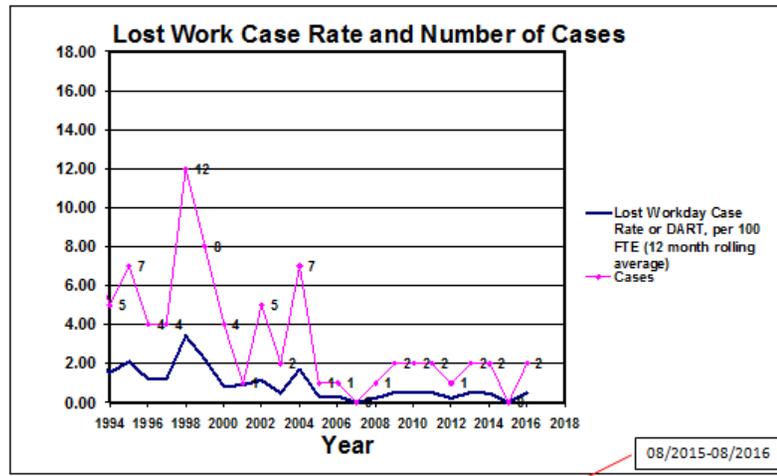
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SAFETY STATS: Peter Cirnigliaro



Rolling Average for 12 months

C-AD Occupational Injury Statistics

For Year 2015 For Year* 2016

First Aid Cases	5	3
Recordable Cases	1	2
Lost Work Cases	0	2

* Calendar Year through 8/2016