

MAR '16  
ISSUE

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

A WORD FROM  
THE:

PREVIOUS ISSUES

February 2016

Administration

[{HOME PAGE}](#)

BNL WEBSITE | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

Accelerator Div.

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

ES&F Div.

Acc. R&D Div.

Operations

▶ Arrivals/Departures

 Safety Stats



## NOTE FROM OUR CHAIR: Thomas Roser

On March 7, Mark Palmer, the new Director of the Accelerator Test Facility, joined C-AD. Mark comes to us from Fermilab, where he was leading the Muon Accelerator Program, a position that he will continue at Brookhaven. Before Fermilab, Mark was directing the test accelerator operation of CESR at Cornell. As a part of his duties as ATF Director, Mark will also have overall responsibility for the ATF-II upgrade.

With increased Linac proton beam intensity and the new target raster system record production of the medical isotope Sr-82 was achieved at BLIP. The amount of the isotope production per irradiation cycle was about twice of previous production amounts. Congratulations to the whole team for successfully completing the upgrade project and making it operational much ahead of the original schedule.

In the meantime RHIC has achieved new record peak and integrated luminosity for gold on gold collider operations. The high luminosities were achieved with the high intensity gold beam from the AGS and the very effective stochastic cooling in RHIC. With the stochastic cooling the vast majority of the gold beam is used up in the beam collisions at the experiments STAR and PHENIX.

## [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!

## Is your work space ergonomic?

Content paraphrased from the Lessons Learned article ["Ergonomically Correct Equipment Can Decrease the Risk for Work Station Injuries."](#)

## EVENTS/SEMINARS

**March 21 - (Instrumentation Division Seminar Rm. | 12p) BERA Maker Club**

**March 23 - (Berkner Hall. Rm. B | 12p) Tax Overview Workshop for Visiting Foreign National**

**March 30 - (Brookhaven Center| 8:30a) Brookhaven Women in Science Event**

The human body is designed to move. Static posture at a computer work station for an extended period of time results in tired muscles and poor posture, which can cause unproductivity and discomfort in the workplace, as well as an increased risk of musculoskeletal disorders and injuries.

Take the time to consider how you can improve your work environment...

First steps:

1. Perform a self-assessment of your workstation with the checklist available on the OSHA website: [https://www.osha.gov/SLTC/etools/computerworkstations/checklist\\_evaluation.html](https://www.osha.gov/SLTC/etools/computerworkstations/checklist_evaluation.html)
2. Request an ergonomic assessment of your work station by contacting your supervisor or your employer's occupational safety and health professional.

Some tips:

**Alter Your Posture throughout the Day**—change positions frequently by stretching, standing or walking for a couple of minutes every half hour. Consider a height adjustable desk that allows the user to alternate sitting and standing throughout the day.

**Check Your Chair**—checking the adjustable options on your chair such as height, seat depth, armrest height and width, and lumbar support is an easy way to make your workspace more comfortable and ergonomic.

**Consider these Accessories for your Work Station**—

**Monitors** - single and dual should be adjustable (height, angle depth, etc.). Adjust the computer screen(s) so that the top of the screen is at eye level. The chin should be slightly tucked in while viewing the monitor(s).

**Keyboards** - split keyboards and smaller footprint keyboards are options.

**Keyboard trays** - trays are adjustable with regard to angle and height.

**Mice and trackballs** - mice should fit the contour of the hand.

**Document Holders** - especially recommended for employees who type from hard copy reference materials, to bring the reference material to the correct height.

**Be safe and be well!**

**April 4 - (Bldg. 735 | 11a) CFN Special Seminar "Luminescent Materials Development for Photonic Applications"**

**April 6 - (Bldg. 317, Recreation Hall | 10a) Hospitality Coffee & Playgroup Event**

**April 7 - (Bldg. 815E, Conference Rm. | 11a) Environmental & Climate Sciences Department Seminar**

**April 14 - (Bldg. 735, Seminar Rm., 2nd Floor | 11a) CFN Colloquium**

**April 14 - (Berkner Hall, Rm. B) 6:30p) Community Advisory Council Meeting**

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*IN OTHER NEWS...*

*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 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](#)



NGC 2903, a barred spiral galaxy 30 million light years away in the constellation Leo.  
Another beautiful shot by Steve Bellavia!

[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 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.](#)

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WHAT'S GOING ON IN OUR NEIGHBORHOOD?

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*Interested in Cycling?*

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DAY AT THE VINEYARDS...

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*Duckwalk North - SOUTHOLD - Music on*

<http://www.bicyclongisland.org/majoride.htm>

<http://www.cyclotour.com/events.htm>

***Interested in Running or Walking?***

**May the Road Rise to Meet Ye 5K Run/Walk** - Mar 19 in Patchogue

**St. Patrick's Day Run** - Mar 19 in Huntington

**City Running Tours - Brooklyn Bridge Running Tour** - Mar 25 in NYC

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

***For the Kids:***

**Enter Now - Long Island's Got Talent 2016!** - The Ward Melville Heritage Organization's Youth Corps is proud to once again present its annual music showcase. Registration is now underway for vocal and instrumental musicians ages 10-17 to have a chance to share their talent at a special performance on Friday, April 8th. All entries must be received by March 23.

***Stony Brook Events:***

**The Jazz Loft "Sneak Preview"** - RSVP by April 1st to attend an open house of The Jazz Loft. This one day only sneak peak will be held on April 18th from 2-5p. H'ordeurves and wine will be served with a side of Live Jazz.

***Port Jefferson Events:***

**"Janis: Little Girl Blue", PJ Documentary Series** – Mar 21 at 7pm at Theater Three in PJ Village

**Easter Parade and Egg Hunt** - Mar 27 in PJ Village

**"The Anthropologist", PJ Documentary Series** - Mar 28 at 7pm at Theater Three in PJ Village

*Check out Erik Forsyth's Travels:*

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)

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



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

**MAR '16  
ISSUE**

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

**A WORD FROM  
THE:**

PREVIOUS ISSUES

**August 2015**

[Administration](#)

{ [HOME PAGE](#) }

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

[Accelerator Div.](#)

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

[ES&F Div.](#)

[Acc. R&D Div.](#)

[Operations](#)

**NOTE FROM OUR ADMINISTRATION:** Sue Pankowski

[▶ Arrivals/Departures](#)

[Safety Stats](#)



The month of March brings a flurry of activity to C-AD with various programs operating in full swing or preparing to kick off, and C-AD's financial picture for FY16 is shaping up. The RHIC operations budget has grown (ever-so-slightly) over last year, a welcome change following years of flat budgets, and much needed to assist us in achieving our operational goals. The Medical Isotope Research and Production program is also active, and support from DOE will provide for a production schedule that continues into early July. NSRL's Spring run will commence shortly, and our partners at NASA have recently approved a new contract that extends that collaboration another four years. Meanwhile, the ATF, supported by DOE's Office of High Energy Physics, is busy providing its user base with beamtime on the electron accelerator and CO2 laser. And over in building 901, our colleagues at the Tandem are also supporting their user community. With all of this operating activity, along with continuing upgrade and R&D efforts, occurring simultaneously, we are managing our finances according to plan.

A few reminders...

Annual Asset Validations - Each year employees are asked to review a list of assets assigned to them in order to acknowledge that the assets are in their possession and verify that the data for each asset is correct. This process is automated via an email link generated by PeopleSoft. Please be attentive and respond when you see the request, and enter April Spencer as your AD Property Rep.

Web Req Processing - If you're preparing a web req, work order, or RFQ, please remember to send a copy to Steve Bubka in the C-AD administrative group. Steve will review your requisition and ensure that it gets routed for all required approvals. Very often during his review he may correct a project number, or spot an incorrect code that could save your program money. Once he has all necessary approvals, Steve "pins" your requisition, which is the approval step that moves your request over to BNL Procurement. So if you want to keep your procurement moving, make sure you've kept Steve in the loop. And don't forget to copy him on those "Delegation of Authority" messages also.

**MAR '16  
ISSUE**

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

**A WORD FROM  
THE:**

PREVIOUS ISSUES

**August 2015**

[Administration](#)

[{HOME PAGE}](#)

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

[Accelerator Div.](#)

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

[ES&F Div.](#)

[Acc. R&D Div.](#)

[Operations](#)

**NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer**

[▶ Arrivals/Departures](#)

[Safety Stats](#)



The RHIC Run-16, coordinated this year by Xiaofeng Gu, is progressing very well with luminosities higher than projected. This is largely due to a new bunch merging scheme in the AGS that provides higher gold bunch intensities for RHIC at the same longitudinal emittance. Keith Zeno was the driving force behind the implementation of the scheme.

The injectors will do a number of important tests in the next weeks. First, deuteron beam will be prepared for the upcoming d+Au part of the run. Second, ruthenium-96 beams will be prepared in preparation of a possible run next year. The natural abundance for Ru-96 is only 5.6% but the Tandem was able to produce a good Run-96 beam that we can inject into the Booster. Third, we will have polarized protons in the AGS, in preparation for next year's RHIC run.

Furthermore, the RF group was able to commission the new 56 MHz SRF cavity to 1 MV of voltage in a configuration without the Higher Order Mode (HOM) damper. The HOM damper is a device to ensure beam stability but had to be removed before the run because it limited the voltage to 420 kV. This is an extraordinary achievement, thanks to Sal Polizzo, Kevin Mernick, Kevin Smith, and others.

Chuyu Liu, the Run Coordinator for the upcoming d+Au run, also made a number of tests to ensure that we can run with the reduced aperture in IR2 due to the installed CeC equipment.

For use at BLIP, the Linac set a new average current record of 165 micro-A, thanks to an optimized space charge compensation by Deepak Raparia. This exceeds to 152 micro-A that had only been set a few weeks ago. With the new BLIP Raster system, the higher currents can be used for the production of more medical isotopes at BLIP.

**MAR '16  
ISSUE**

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

**A WORD FROM  
THE:**

PREVIOUS ISSUES

**August 2015**

[Administration](#)

[{HOME PAGE}](#)

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

[Accelerator Div.](#)

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

[ES&F Div.](#)

[Acc. R&D Div.](#)

[Operations](#)

**NOTE FROM OUR EXPERIMENTAL SUPPORT & FACILITIES DIVISION:** Bill Christie

[▶ Arrivals/Departures](#)

[Safety Stats](#)



The current RHIC Experimental program is running well. Both RHIC experiments, PHENIX and STAR, are running efficiently and making good progress towards achieving their Physics data set goals. The current program running, top energy Au on Au, is scheduled to run for a total of ten weeks, which would mean that we end this on Monday, April 18th. The Experiments have been asked to be prepared on March 22nd to discuss whether we should hold this end date for the Au on Au run, or modify it.

Next in line after the Au on Au running is low energy (19.6 GeV nucleon nucleon center of mass energy) deuteron on Au. With the RHIC well underway, planning for the upcoming shutdown/maintenance period is in progress. With the current RHIC schedule, beam operations in RHIC are scheduled to end on June 3rd, with the RHIC cryo warm up complete by June 7th.

MAR '16  
ISSUE

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

A WORD FROM  
THE:

PREVIOUS ISSUES

**August 2015**

Administration

{[HOME PAGE](#)}

BNL WEBSITE | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

Accelerator Div.

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

ES&F Div.

Acc. R&D Div.

Link to: [ATF Newsletter](#)

Operations

**NOTE FROM ACCELERATOR R&D DIVISION: Ilan Ben-Zvi**

▶ Arrivals/Departures

○ Safety Stats



#### Polarized Electron Gun R&D

The prototype funneling polarized electron gun, also whimsically called the "Gatling Gun", has landmark runs during January and February. The gun was conditioned to over 70 kV, but was operated at 45 kV due to a limitation of the rotating field power supplies. The dark lifetime (high voltage on, laser off) was measured at 52 hours. Nice beams were generated from two cathodes, first separately and then combined by pulsing the laser beam and rotating the beam combiner field. The rotation was relatively slow, at Combined beam from two cathodes were measured at two values of the average current, 175 nA and 350 nA (at a duty factor of 0.165). The ion back-bombardment cathode lifetime was measured and it has been shown that the charge-lifetime of two cathodes, when operated in a combined mode, was the sum of the charge lifetime of the two cathodes when operated separately. More analysis is under way. A rich program of improvements, in particular the vacuum system, power supplies to support a higher operating voltage and an improved beam dump. The plan will also include a campaign of increasing the current to the milliamperere scale and use of supper-lattice cathodes.

#### eRHIC Design

The work on eRHIC preliminary Conceptual Design Report (pCDR) is practically complete. The pCDR and the current state of the eRHIC design will be presented to the eRHIC R&D Advisory Committee at the April 7-8, 2016 meeting.

#### Accelerator Test Facility

I would like to personally welcome the incoming ATF Director, Mark Palmer, who just started work at C-AD. Mark will take over also the management of the ATF-II construction project. The ATF scientific program has fared well in the last few years as a National User Facility under the interim Directorship or Igor Pogorelsky, whom I would like to thank warmly for carrying out the burden of running the day-to-day activities of the ATF, support the ATF-II construction project and continue to evolve the ambitious 100 fold power upgrade of the ATF CO2 laser.

MAR '16  
ISSUE

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

A WORD FROM  
THE:

PREVIOUS ISSUES

**August 2015**

Administration

{[HOME PAGE](#)}

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

Accelerator Div.

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

ES&F Div.

Acc. R&D Div.

Operations

**NOTE FROM OPERATIONS:** Paul Sampson



RHIC Run-16 began last month and will continue throughout March. Good running conditions have been established and focus has been on increased reliability and uptime. Work on projects in the tunnel including CeC and LEReC continue during Maintenance and other access periods.

The pre-injectors continue to run well, with setup for increased intensity and alternate ions continuing behind RHIC stores. Preparation for Polarized Proton studies in the injectors have been delayed due to issues with the AGS cold snake but should resume later in the month. Preparation for the NSRL run 61A, scheduled to start mid-month, has also started.

LINAC is running well for BLIP. The Raster system is running well and the current on target has been steady at a current exceeding 150uA. LINAC maintenance periods continue to be executed independently from RHIC and around scheduled BLIP work.

EBIS has been running well, delivering beams to the Booster for RHIC fills, development and NSRL setup. The Booster continues to run well. Turn, checkout and startup with beam for NSRL will begin early this month.

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.

▶ Arrivals/Departures

 Safety Stats

MAR '16  
ISSUE

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

A WORD FROM  
THE:

PREVIOUS ISSUES

**August 2015**

[Administration](#)

[{HOME PAGE}](#)

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

[Accelerator Div.](#)

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

[ES&F Div.](#)

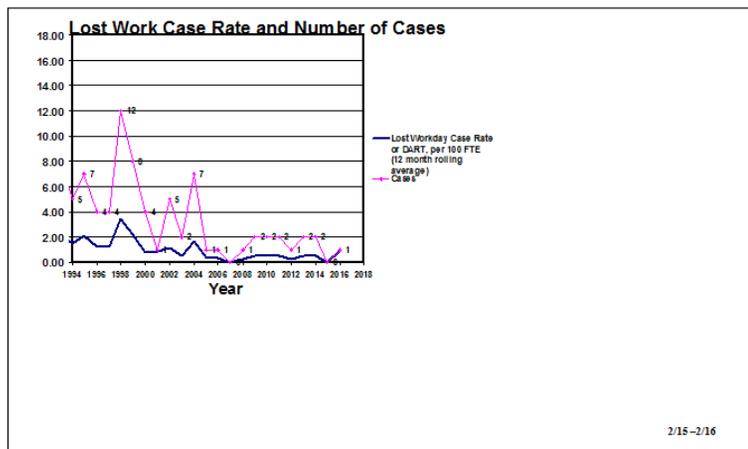
[Acc. R&D Div.](#)

[Operations](#)

## SAFETY STATS: Peter Cernigliaro

[Arrivals/Departures](#)

 Safety Stats



### C-AD Occupational Injury Statistics

	For Year 2015	For Year* 2016
First Aid Cases	5	1
Recordable Cases	1	1
Lost Work Cases	0	1

\* Calendar Year through 2/15

MAR '16  
ISSUE

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

Contact: [A. Lamberti](#)

A WORD FROM  
THE:

PREVIOUS ISSUES

**August 2015**

[Administration](#)

[{HOME PAGE}](#)

[BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE](#)

[Accelerator Div.](#)

Quote of the Month: "The joy of discovery is certainly the liveliest that the mind of man can ever feel." - Claude Bernard

[ES&F Div.](#)

[Acc. R&D Div.](#)

**ARRIVALS:** Welcome!

[Operations](#)

**Mark Palmer** - Accelerator Test Facility

[▶ Arrivals/Departures](#)

**DEPARTURES:** Farewell, you will surely be missed..

 [Safety Stats](#)

*Guest Notices:*