

**JULY '16  
ISSUE**

# PARTICLE POST

COLLIDER-ACCELERATOR DEPARTMENT

PREVIOUS ISSUES

**June 2016**

Contact: [A. Lamberti](#)

[{HOME PAGE}](#) | [BNL WEBSITE](#) | [C-AD WEBSITE](#) | [ES&F WEBSITE](#) | [BERA](#) | [BNL CLASSIFIED ADS](#) | [INSIDE RHIC](#)

Quote of the Month: "I have not failed. I've successfully discovered 10,000 things that won't work." - Thomas Edison

## A WORD FROM THE:

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### NOTE FROM OUR CHAIR: Thomas Roser

Summer has arrived and this means RHIC is in shutdown. The 2 o'clock interaction region will again be a very busy place this summer. Activities are already in full swing. The 704 MHz cryostat in IR 2 was already removed from the beam line and is being readied for shipment to Niowave and ANL to have the cavity cleaned. Installation of the equipment for the Low Energy RHIC electron Cooling (LEReC) also continues. The high intensity electron source of LEReC was constructed at Cornell University and is undergoing conditioning now. Later this summer it will be moved to BNL and IR2 where commissioning with beam will start.

Also, with Run-16 the PHENIX detector has completed its 16 year long, successful operation as one of the two major multi-purpose RHIC experiments and will be disassembled starting this summer. A new detector, sPHENIX, will take its place in the 8 o'clock interaction region after a 4-year long construction period. In the meantime, STAR will be the only RHIC detector. STAR is well suited for the upcoming RHIC runs, especially for the second, high luminosity low energy Beam Energy Scan planned for 2019 and 2020.

## [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!

**Several C-AD employees were recognized this month for their distinguished contributions to Brookhaven Laboratory and were presented with the highest accolades given by Brookhaven to its employees at this year's 2016 Employee Awards Ceremony.**

## EVENTS/SEMINARS

**July 19 - (Berkner Hall Auditorium | 1p) All-Employee Meeting**

**July 21 - (Bldg. 555, Hamilton Seminar Rm. | 9a) Get to Know the Lab "Discovery Park Update"**

**July 24 - (Berkner Hall | 10a) Summer Sunday: Brilliant Light, Dazzling Discoveries** - Visit the National Synchrotron Light Source II, where scientists use intense beams of light to see the inner structure of batteries, proteins, space dust and more.

**July 27 - (Berkner Hall, Rm. B | 12p) The Foundation for Personal Financial Education: "FPFE Financial Preparation for College Costs"**

**July 31 - (Berkner Hall | 10a) Summer Sunday: Atom-**



Masahiro Okamura was presented with the Science & Technology Award for the "design and constructions of a laser ion source that delivers many species of ions in rapid succession to the NASA Space Radiation Lab, while simultaneously sending intense, bright beams to the RHIC...the first that is stable enough to serve an operating user facility". Read more about Masahiro's contribution [here](#).



**Smashing Fun** - Explore the RHIC, where particles are smashed together at near-light speed to reveal the secrets of our universe.

**August 1 - (Bldg. 510, Large Seminar Rm. | 4p)**  
**Sambamurti Lecture "Electron-Positron Tomography Seeking Symmetry in the Quark-Gluon Plasma"**

**August 3 - (Berkner Hall Auditorium | 12p) BSA Noon Recital: Pianofest in the Hamptons**

**August 4 - (Bldg. 510, Physics Seminar Rm. | 9a)**  
**Coffee & Conversation**

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#### 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 particles into three-dimensional crystalline lattices. Such control allows



Don Bruno was presented with the Engineering Award for significantly increasing the reliability of power supply systems for the RHIC through his engineering and managerial skills. Don has minimized machine downtime by systematically analyzing the cause of each power supply failure and improving methods to recover. Read more about Don's contribution [here](#).



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.](#)

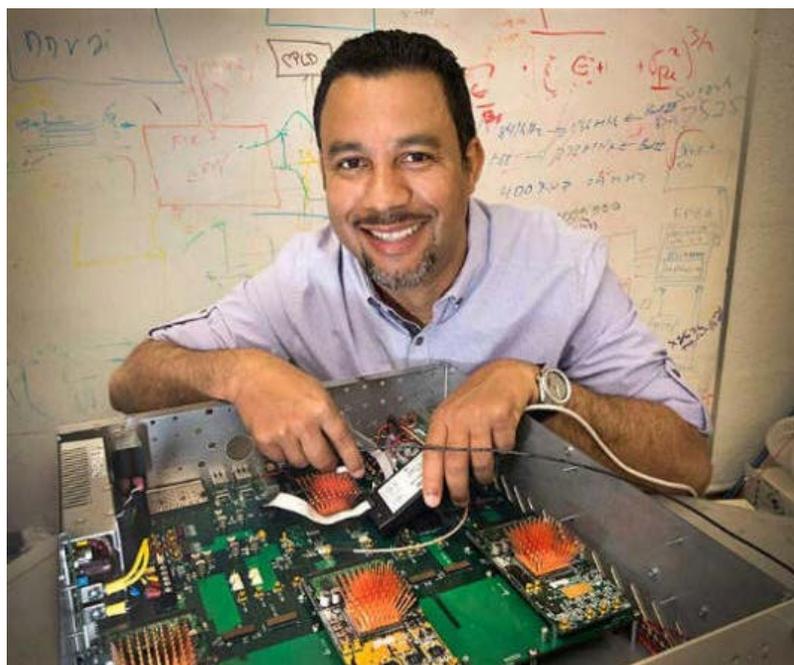
*'Inflatable Dark Matter' Could Explain Why We See Less Than Many Theories Predict*

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*



Freddy Severino was also presented with the Engineering Award for playing a "pivotal role in the design of new low-level radio frequency systems for the accelerators in the C-AD. He has been instrumental in providing hardware, firmware, and software solutions - often under extremely tight time constraints." Read more about Freddy's contribution [here](#).



Brookhaven Lab also recognized two distinguished scientists from C-AD who were granted tenure. Tenure appointments are granted by action of the BSA Board after a rigorous selection process overseen by the BSA Science and Technology Steering Committee. Congratulations to Haixin Huang and Michiko Minty on

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*

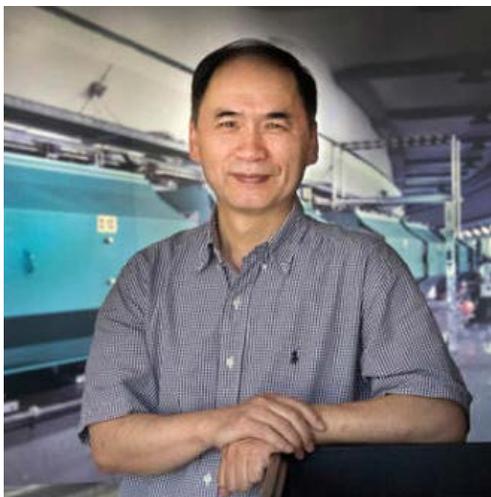
The BNL's Relativistic Heavy Ion Collider smashed together large nuclei at nearly the speed of light to recreate the fundamental particles in the primordial soup present during the earliest days of the universe. [Read more.](#)

*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.](#)

this great achievement!

Haixin was awarded tenure for his "achievements in the field of accelerator science - specifically for his leadership in preserving spin polarization through the Lab's chain of accelerators and for polarimetry improvements at the RHIC". Read more [here](#).



Michiko Minty was awarded tenure for her "significant contributions in designing, constructing, and operating complex user facilities, as well as her contributions to knowledge related to the purposes of the field of accelerator science". Read more [here](#).



**Between an extremely successful RHIC Run and the prestigious awards granted department employees, C-AD has already had an incredibly accomplished 2016! Congratulations to all!**

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**Steve Bellavia is very proud of his daughter, Larissa, who on July 1st graduated from the Navy's Nuclear Power Training Unit!**



Larissa in front of an F-14 that Steve once worked on at Grumman!



**Congratulations to the whole Bellavia family!!**

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## WHAT'S GOING ON IN OUR NEIGHBORHOOD?

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### *Interested in Cycling?*

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

### *Interested in Running or Walking?*

**Airborne 5K Run/Walk** - July 23 in Sayville  
**State Parks Summer Run Series - Caumsett** - July 25 at Hempstead Lake State Park  
**Long Beach Biathlon** - July 31 at Long Beach  
**Marcum Workplace Challenge** - July 26 at Jones Beach; Register by Tuesday, 7/19 online [here](#).



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

### *For the Kids:*

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## DAY AT THE VINEYARDS...

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*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)

*Faumanok Vineyards* - RIVERHEAD - Fresh, Local

**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](#).

**Children's Shows - Daniel Greenwolf's Celtic Magic Show** - Jul 28 (6:30p) at The Barn behind Village Hall

**Stony Brook Events:**

**Sunday Summer Concerts On The Village Green** - FREE! - Every Sunday from July 10 - Aug 21 (7-9p)  
- 7/24: Tom Manuel & His All Stars, 7/31: Just Sixties!, 8/7: Jack's Waterfall, 8/14: Left Jab & 8/21: The Precisions

**Culper Spy Day - Jul 23 (9-4p)** Explore The Brewster House with a self-guided tour and experience a colonial cooking demonstration; explore The Thompson House with a visit to Dr. Thompson's Healing Garden, a collection of herbal remedies from Native American, African American and Colonial American cultures.

**Motorcycles and the Open Road** - Jul 9 - Sep 5 Unique motorcycles from across the decades are on exhibit at the Educational & Cultural Center with special events throughout; open 7 days a week.

**It Take a Team to Build a Village Special Exhibit** - May 21 - Sep 7 Experience the story of the reconstruction of Stony Brook Village in a Spring and Summer long exhibit on the building of the Stony Brook Village Center! On display will be historical documents, photos, original prints, sketches, memorabilia and more.

**Performances at The Jazz Loft** - Jun 3 - Jul 30 Check out upcoming performances in June by visiting their website's [box office](#).

**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:**

**Movies on the Harbor** - Jul 19 at Harborfront Park (8p) - Jurassic World; Jul 26 - The Good Dinosaur

**Sunset Concerts - Gene Casey and the Lone Sharks** - Jul 20 at Harborfront Park (6:30p); Jul 27 - Caroline Doctorow Trio

**Summer Harborside Concert Series - Cold Spring Harbor Band** - Jul 21 at Harborfront Park (8p)

**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.

Erik Forsyth recently presented at Nikola Tesla's 160th Birthday Celebration on July 10th at the Tesla Science Center at Wardencllyffe, the site of his last standing lab in Shoreham. The presentation was entitled, "Tesla's Patent for Long Distance Electric Power Transmission".

*Check out Erik Forsyth's Travels:*



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

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## NOTE FROM OUR ADMINISTRATION: Sue Pankowski



With the completion of RHIC run 16, we welcome the summer months with a variety of projects to be completed during the annual shutdown. It is typical during this time of year that someone in my position would advise you to spend wisely, plan thoughtfully, and make every dollar count when it comes to procurement activity. This advice should be standard protocol, regardless of time of year. With that said, here are a few added reminders:

- Use proper project numbers for webreqs., credit card purchases, work orders and timecards.
- Where costs are incurred that benefit multiple programs, the expense should be shared in proportion to the benefit.
- Personnel responsible for webreq. approvals should alert Steve Bubka when designating a delegate to approve purchases in their absence.
- Review month end reports for your credit card transactions, as well as for stores withdrawals and labor changes to ensure that all charges are appropriate.
- Be attentive to timecard submission schedules, particularly when it occurs during planned vacation time; supervisors responsible for timecard approvals should consider assigning a delegate for approvals during vacation.

Your attention to these tips will assist in verifying that costs are accurately charged and also help in avoiding unnecessary purchasing delays.

Enjoy your summer!

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



In many years we had extraordinary RHIC runs, and it is sometimes difficult to imagine that the next year could be even better. And yet, this year the RHIC Run Coordinators Xiaofeng Gu (Au+Au) and Chuyu Liu (d+Au) with the outstanding support of the whole department orchestrated some extraordinary achievements across the whole accelerator complex:

- the highest Au+Au luminosity yet with more collisions in 10 min than in the entire 5-week commissioning run in 2001, and at the same time luminosity for STAR delivered at an almost constant rate
- a replacement of a RHIC dipole cold quench protection diode in just 19 days
- d+Au collision of about 1 week each at 4 different energies and a return to Au+Au for a week demonstrating an unparalleled collider flexibility
- record Au amounts from EBIS, the Booster and the AGS for RHIC
- record deuteron intensity from the Tandem, Au delivery during 2 EBIS outages, and demonstration of ruthenium-96 (which has only 5.5% natural abundance) for future runs
- 56 MHz SRF operation at 1 MV without any HOM dampers - the first operational SRF cavity in RHIC
- demonstration of a critical recombination monitor for LEReC
- CeC beam delivered from the gun to the dump
- and in parallel to the RHIC program record intensity delivered to BLIP thanks to a new raster system and Linac intensity upgrades, as well as reliable beam delivery to NSRL

We also commemorate the 25th anniversary of the first acceleration and extraction of beam from the Booster, enjoy a little history provided by Bill Weng (<https://www.bnl.gov/newsroom/news.php?a=26425>).

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



As scheduled, RHIC Run 16 beam operations ceased on Monday morning, June 27th. For the last about nine days of the run RHIC went back to running the 200 GeV Au (Gold) on Au collisions that we'd started the run with. PHENIX took advantage of these collisions to add to their Au on Au statistics, having reached their data set goals for this system in the earlier Au on Au running. Due to the exceptional uptime and efficiency of both RHIC and the STAR experiment in the last running period, and by changing their trigger configuration and Data Acquisition (DAQ) bandwidth allocation, STAR was able to accumulate just over 500 million events for their Heavy Flavor Tracker (HFT) data set goal, allowing them to reach (and barely exceed) the goal of 2 billion events for this program. RHIC Run 16 was a resounding success for RHIC, PHENIX and STAR.

With the end of beam operations, and the cryogenic warmup of the RHIC rings, there has been a lot of activity out at both experiments. Run 16 marked the end of the operational life for the PHENIX experiment, and they are into what is projected to be about an 18 month effort to disassemble the experiment. STAR has been in the preparatory phase of getting ready to roll the detector from the Interaction Region (IR) out to the Assembly Building (AB). The actual detector move is on schedule to occur starting on July 20th. Once in the AB the plan calls for removing the silicon detector sub systems that make up the HFT which have completed their physics program. The small diameter (4 cm) central beam pipe will be replaced with the original 8 cm diameter central beam pipe, and then the detector will be rolled back into the IR in September.

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Link to: [ATF Newsletter](#)

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



Not available for comment at the time of this publication.

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## NOTE FROM OPERATIONS: Paul Sampson



July began with the end of the greatly successful RHIC 2016 run. Achievements of note included, record Au+Au luminosity and deuteron and Au intensity from EBIS and in the injectors, operation of the 56 MHz Super Conducting RF cavity, beam from the CeC gun to the dump, demonstration of ability to run ruthenium and others. Many congratulations to all groups involved, this is arguably the best RHIC run yet!

AGS and Booster are in shutdown mode with work underway. Major items in Booster include re-roofing of the main building (914) and installation of the updated actuator for NSRL's galactic simulator. In AGS, repair of the cold snake in preparation of the Polarized Proton run next year.

LINAC continues to run well for BLIP. There was a successful 200 MeV patient run over the holiday and production is presently running well at 160 MeV. This will continue until late in the month. The BLIP run will end Aug 1st.

EBIS and Tandem 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**



No comment at the time of this publication.

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



This summer 801 is teeming with students as 24 graduate and undergraduate students are utilizing its unique facilities to learn about nuclear and radiochemistry. Since 1984, BNL has hosted the Nuclear Chemistry Summer School (NCSS), a program funded by the DOE to develop workforce in nuclear chemistry. This initiative was established due to the shortage in the workforce which has mainly been attributed to a sharp decline in the number of colleges offering degrees in nuclear and radiochemistry. In the recent NSAC report it was highlighted that owing to its aging and retiring workforce the US is facing a substantial loss in expertise in nuclear and radiochemistry. To combat this NCSS was established to train and educate 24 students between two sites, BNL and San Jose State University every year. The students with interest in nuclear science are selected through a competitive peer reviewed process. Experts in the field are brought in from around the country to give lectures on various aspects of nuclear chemistry. The 6 week course includes a laboratory portion in which the students have the opportunity to gain hands-on training on how to count radioactive samples, conduct a radioimmunoassay, and setup and evaluate radiochemical generators. When not in the classroom or laboratory the students visit nuclear power plants, radiopharmacies and hospitals participating in nuclear medicine and therapy. The program has a high success rate of retaining students working in the fields of nuclear and radiochemistry.

In addition to the NCSS program, 9 students funded through SULI, GEM, and SCGSR programs are conducting research side by side with MIRP staff. The students are working on a variety of projects focused on separation and production of radionuclides. The research projects vary from the electrochemical separation of Copper-67, a dual purpose radioisotope for SPECT imaging and therapy, to evaluating new resins for improved separations and/or as possible means to supply new medical isotope generators. These generators require appreciable amounts of actinium-225, titanium-44 and selenium-72 to decay-generate clinically relevant quantities of daughter nuclides Bi-213, Sc-44 and As-72. The former is used for targeted alpha therapy and the latter two are both used for positron emission tomography (PET). The parents isotopes are produced at BLIP by proton irradiation of massive targets.

MIRP is also hosting a visiting faculty member Dr. Francesconi from Hunter College under the Visiting Faculty Program administered through BNL's OEP office. Together with Dr. Ben Burton-Pye from Lehman College and their student Huseyin Cicek they are evaluating if polyoxometallates and ligands can be used to complex thorium and/or Ac-225 or some of the other radiometals produced during the thorium irradiations. These studies could help minimize the time and waste associated with the extraction of the Ac-225 and other radiometals produced.

It has been a pleasure to see 801 full this summer with students excited to utilize its unique facilities to solve real world problems. MIRP would like to thank the support it has received from the C-AD A&R Division and FS group as well as BNL OEP in preparing for the students and ensuring the have a positive learning experience.

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## **ARRIVALS: Welcome!**

**Patrick Inacker** - Laser Systems for Instrumentation Systems, Accelerator Division

**James Meier** - Maintenance Support for Machine Operations, Accelerator Division

**Ronald Napoli** - Polarized Gun, eRHIC Research & Development

**Danny Puleo** - Design & Documentation, ES&F Division

**Julio Renta** - Technical Support for Instrumentation Systems, Accelerator Division

## **2016 SUMMER STUDENTS & VISITORS: Welcome!**

**Jessica Abruzzese** - eRHIC Research & Development

**Mamoudou Ba** - eRHIC Research & Development

**Ryan Benante** - Experimental Support & Facilities

**Taylor Campbell** - Mechanical Systems, Accelerator Division

**Huseyin Cicek** - Medical Isotope Research & Production

**Marc DiFilippo** - Communications & Electronic Support, ES&F Division

**Amani Ebrahim** - Medical Isotope Research & Production

**Lynn Francesconi** - Medical Isotope Research & Production

**Klaire Hubbard** - Medical Isotope Research & Production

**Nida Imtiaz** - Electrical Systems, Accelerator Division

**Kerry Jappe** - Mechanical Systems, Accelerator Division

**Wayne Johnson** - Mechanical Systems, Accelerator Division

**Matthew Killicharran** - Accelerator Test Facility

**Randy Kipnis** - Physics Support, ES&F Division

**Lisa Marie Marone** - Accelerator Division

**Fernanda Murillo** - eRHIC Research & Development

**Robert Nidzyn** - Medical Isotope Research & Production

**Jacqueline Noel** - Medical Isotope Research & Production

**Stacy Queern** - Medical Isotope Research & Production

**Hannah Lorraine Seymour** - Physics Support, ES&F Division

**Roger Smith** - Controls Systems, Accelerator Division

**Matthew Tomko** - Controls Systems, Accelerator Division

**Megan Wilken** - Medical Isotope Research & Production

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

**Rajah Goodrich**

**Guest Notices:**

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**August 2015**

Contact: [A. Lamberti](#)

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Quote of the Month: "I have not failed. I've successfully discovered 10,000 things that won't work." - Thomas Edison

***A WORD FROM  
THE:***

Administration

Accelerator Div.

ES&F Div.

Acc. R&D Div.

Operations

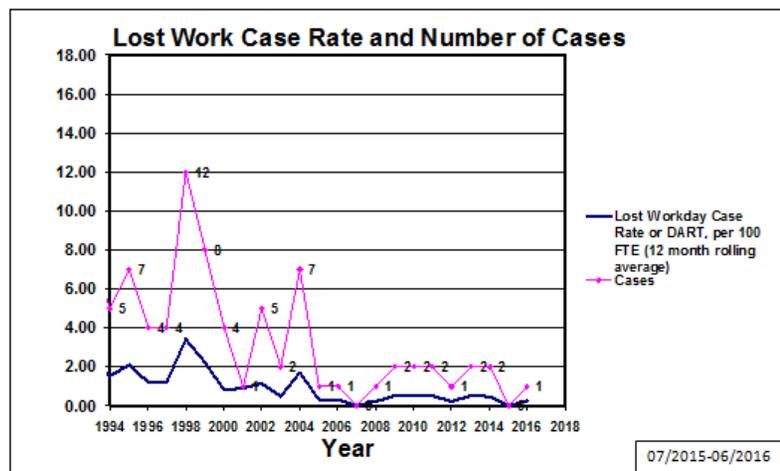
Acc. Test Facility

MIRP

▶ Arrivals/Departures

 Safety Stats

**SAFETY STATS:** Peter Cirnigliaro



07/2015-06/2016

**C-AD Occupational Injury  
Statistics**

For Year 2015 For Year\* 2016

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

\* Calendar Year through 6/30/2016