

Contact: [C. Scholf](#)

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November 2014

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A WORD FROM THE:

Administration

Accelerator Div.

ES&F Div.

Acc. R&D Div.

Operations

▶ Arrivals/Departures

 Safety Stats

Quote of the Month: "The characteristic of scientific progress is our knowing that we did not know." - Gaston Bachelard

NOTE FROM OUR CHAIR: Thomas Roser



RHIC start up for Run-15 is going well and we are still on track for a start of the 4K cool-down on January 20, 2015. By the time this Particle Post is published we will probably know whether Congress will pass another Continuing Resolution (CR) or an appropriation for the rest of FY15 for the federal budget. In either case we will have a 22 week RHIC run this year and also in either case our budget for RHIC will be very tight. We will need to maintain the lean staffing level for RHIC operations and also limit purchases to what is necessary to accomplish the high priority goals of this year: successful pp and pAu run, progress with the CeC Proof-of-Principle experiment and start of construction of the Low Energy RHIC electron Cooling (LEReC).

The BLIP Raster project made great progress this year. The beam line section in front of the BLIP target was completely replaced with all new equipment including much needed new instrumentation. This was accomplished in record time. The last items to complete the project, the two raster magnets, will be installed next summer.

VIEW [CONFERENCE PROJECTIONS FOR 2014: DUE ASAP](#) -

[CONFERENCES SHOULD BE PROJECTED THROUGH APRIL 2015](#)

DID YOU KNOW??

Check out who received an employee Service Award this year! 2014 Collider-Accelerator Dept. employees who received a [Service Award](#). Last year Service Awards are listed [here](#). 2012 Service Awards are listed [here](#).

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

EVENTS/SEMINARS...



Check out the [BNL Calendar](#) for upcoming events & Seminars or the [Upcoming Conferences & Workshops](#) page for workshops and Conferences happening at BNL.

Nov. 11 - LAB HOLIDAY - VETERANS DAY

Congratulations to Shawn Perez and his wife on thier brand new baby!

Steve Bellavia captured this picture - This is an image of the crab nebula, a supernova remnant and pulsar wind nebula in the constellation Taurus, formed from a star that exploded in 1054 AD. This star was visible for 23 days in the daytime, as reported by the Chinese as well as Native Americans. However, there is no report of this supernova from Europe, for unknown reasons. (Taken in late November this year)



Amazing .. Thank you Steve!

Paul O'Connor showed us what the crab nebula would look like through a 2.4m with an LSST prototype sensor.. this was taken on 9/18/2009



Dec. 11 - (Brookhaven Center | 9am) BLOOD DRIVE

Dec. 11 - (911B - Lobby) Pizza & Star Trek

Dec. 15 - (Bldg 510 - LSR | 4pm) C-AD Accelerator Physics Seminar "An FFAG-ERL at Cornell University to Prototype eRHIC Components" presented by Dr. Georg Hoffstaetter (Cornell U.)

Dec. 16 - (Bldg 510 - SSR |11am) Nuclear Physics Seminar "Measurement of the correlation between elliptic and higher-order flow harmonics in Pb+Pb collisions at $\sqrt{s_{\text{NN}}}=2.76$ TeV with the ATLAS detector at the LHC." presented by Soumya Mhapatra (Columbia U.)

Dec. 17 - (Berkner Hall Lobby | 11am) Berkner Bake Sale

Dec. 17 - (Berkner Hall AUD | 1:45pm) Inventor Celebration

Dec. 17 - (Berkner Hall AUD | 4pm) Brookhaven Lecture "Bacteriophage T7: Small Science, Big Impact" presented by Bill Studier

Dec. 18&19 - (Berkner Hall Lobby | 11am) UW Gift Wrapping

Dec 19 - CAD HOLIDAY BREAKFAST

Do you have to give a talk?

Public Speaking Techniques:

Verbal & Non-verbal

Presented by:

Theodore Sampieri Ext: 4894

12:00 – 1:00 Fridays

CAD Building 911

Large Conference Room: 2nd Floor

IN OTHER NEWS...

CNew particle accelerator technology gets high speeds in short distances- *A plasma Wakefield takes relativistic electrons and gives them a boost. What SLAC is working on right now... [Read about it](#)*

Wearable Sensor 'illumiantes' surroundings for the blind *-High school students in Poland develop wearable technology to help blind people navigate their surroundings....[read about it.](#)*

NOTE FROM OUR ADMINISTRATION: S. LaMontagne



No updates at this time...

NOTE FROM OUR EXPERIMENTAL SUPPORT & FACILITIES DIVISION: Phil Pile



We are still on track for cool-down of the RHIC magnets to begin on 20 January. With this, we will be able to get in 22 weeks of RHIC operations for Run 15 before the end of June. The run plan remains unchanged with 100x100 GeV polarized protons followed by 100x100 GeV/n polarized protons on gold and ending with a short 100x100 GeV/n polarized protons on aluminum (a new beam for RHIC). Both experiments are finishing their preparations for the run, with some lingering issues with the PHENIX MPC-EX detector system and the STAR beam IR pipe survey, but should be ready for collisions in late January.

Planning for a major upgrade to the PHENIX experiment continues. The plan calls for a hiatus in RHIC operations in 2017 to allow time to remove the PHENIX experiment and begin preparations for a new PHENIX – sPHENIX. In addition to this work, installation of Phase I of the low energy electron cooling (LEReC) in the 2:00 IR is planned, so 2017 will be a very busy year! As I have said before, sPHENIX will be built around the BaBar superconducting solenoid magnet due to be shipped from SLAC to BNL in mid-January (another delay). Once the magnet arrives it will be setup in Building 912 for testing and remain there until IR 8 is ready to accept the magnet for installation. Details of sPHENIX construction are still being worked on with the hope to have the new experiment completely installed by the end of the second year long shutdown planned for 2020. Approval from DOE to do this is, however, still to come.

BLIP is set to begin commissioning a new beam line and new beam instrumentation (part I of the Raster project). A couple of vacuum problems have surfaced, one with one of the two new Bergoz current transformers and the other with LINAC tank 7. As tank 7 is required for polarized proton operations we will need to fix this before turn on the LINAC with beam so there may be a few days delay in the schedule for BLIP operations. The first BLIP target for Sr-82 production is planned to be put into the beam on Monday, 5 January. BLIP is scheduled to operate through June but may be asked by DOE to continue operations through July.

The NSRL began operation for Run 14C ended on 14 Nov. The next run will come next year in the spring, to be scheduled. A project to raise the maximum beam energy to 1.5 GeV/n is set for installation during the upcoming 2015 summer shutdown. This project will allow for higher energy heavy ion beams to better simulate the galactic cosmic ray spectra that will be encountered by future deep space explorers.

NOTE FROM OUR ACCELERATOR DIVISION: Wolfram Fischer



We are now preparing the start-up of the injector chain, with beam in the Booster expected around 17 December 2015, and start of the 4K cool-down on 20 January 2015. As we are coming to the end of the summer shut-down, a number of upgrades still need to be completed: (0) the Siemens bearings, (i) the RHIC beam dump kicker, (ii) the RHIC beam dump, (iii) a new RHIC bunch-by-bunch damper, (iv) new pre-fire protection masks for the experiments, (v) the removal of the 56 MHz SRF HOM damper, (vi) RHIC polarimeters – both H-jet and pC, (vii) new electron guns and instrumentation for the electron lenses, and (viii) upgrades to the laser ion source LION.

Upcoming events:

08-10 December 2014	AD Machine Advisory Committee Meeting, BNL
20 - January 2015	Planned start of RHIC 4K cool-down
12-13 January 2015	DOE Review of LEReC Project (Low-Energy RHIC electron Cooling)

The catalog of all Technical Notes is <http://www.rhichome.bnl.gov/AGS/InternalReports.html>, and it is linked from both the Department and Accelerator Division home pages.

NOTE FROM OPERATIONS: Paul Sampson



Shutdown FY14 is in its final stages. Major construction, upgrade and maintenance projects continue to make good progress despite some delays and schedule changes.

In RHIC, efforts continue on major projects as well as testing of CeC components, which continued throughout November and early December. Initial conditioning and other tests were successfully completed on the 500MHz bunchers and the 112MHz gun, additional testing and commissioning will be performed throughout the RHIC run.

Other major system maintenance, upgrade and construction projects continue. Focus remains on large projects continues including: e-lens upgrade and repair, PP-PP component installation, “mask” collimator installation, bunch-by-bunch damper installation as well as Beam Dump and Dump Kicker repair and upgrades. At STAR and PHENIX, scheduled work is progressing on or near schedule.

LINAC startup activity has begun. Access Controls certification will be completed early in December and RF conditioning is ongoing. High intensity and polarized beams are expected later in the month, pending repair of a vacuum issue in Tank 7. The BLIP Raster

project work for this shutdown has been completed. The Tandem is running for local users when scheduled.

The AGS checkout begins the week of December 8th with testing of the AGS Cold snake and the AGS Heat Run (using the Westinghouse MG set). Start up with beam will occur in mid December and setup will continue through the first RHIC injection later in January.

Booster restart is scheduled for the week of the 15th of December. Early in the month, line PSEG and the BNL line crew completed NSLS II tie-in to the Main Lab feed, which required that the Booster MMPS remain off.

Scheduled power outages during the shutdown are displayed both on the CATV and on line. Use the “RHIC Broadcast” link below to view all scheduled outages and testing.

Shutdown project progress can also be viewed via the links below.

The CAD CATV system display includes daily updates including Testing, power disruptions and outages as well as important dates. This information can also be seen on the web at [RHIC Broadcast](#).

To view a list of the approved work for shutdown or maintenance, go the [Job Request System](#) and select the appropriate date. This link is behind the firewall and requires privileges to view.

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

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



Polarized electron gun:

The Gatling Gun system was disassembled, packaged and shipped from the Stangenes Company in Palo Alto California to the physics department at Stony Brook University.

The Gatling Gun system was unpacked and assembled. The initial results are very successful. The gun has been assembled for high voltage testing and so far has been determined to be leak tight. Work on the high voltage enclosure was started but was stalled due to an equipment failure that must be repaired before high voltage testing can proceed. The testing of a new TSP pump design to provide XHV pumping in the immediate vicinity of the cathodes was successful and will be incorporated into the gun anode assembly by the Atlas Company.

The LHC Accelerator R&D Program Group:

The proof of principle double quarter wave crab cavity is currently under cold testing at CERN. The first set of results showed the cavity reaching 3.5 MV of deflecting voltage before the quality factor dropped below $10e9$, yet the required operation voltage is 3.3 MV. The voltage was limited by field emission, and the data should improve after conditioning. After the Kick-off meeting in October, the prototype cavity for SPS beam test by the end of 2016 will start fabrication soon at Niowave Inc. The preparation for vertical tests of the bare and dressed prototype cavities has already started at BNL. The RF design of the higher order mode filter has completed and the BNL-UK collaboration has moved into the stage of mechanical and fabrication design. We expect a prototype filter early next year.

The Coherent electron Cooling experiment:

The CeC PoP experiment is making steady progress towards its goals. The success of this month was the conditioning of the 112 MHz SRF gun, which practically reached its design voltage of 2 MV.

We expect that further commissioning of the gun would be as successful as this initial step.

The CeC PoP team deserves congratulations.

The Accelerator Test Facility <http://www.bnl.gov/atf>:

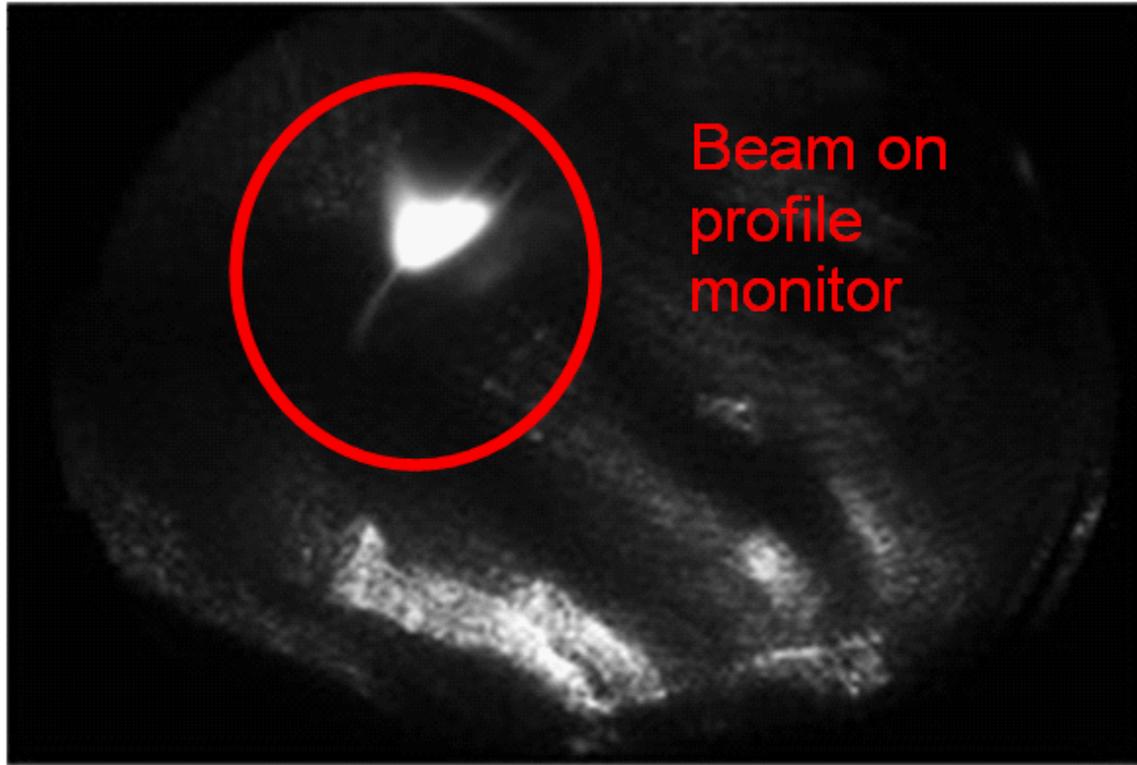
The 17th ATF User and Program Advisory Committee Meeting was held in October, back-to-back with the ATF-II Upgrade Workshop. (<http://www.bnl.gov/atfusersmeeting/>).

Following the October ATF User meeting, a program of user experiments for 2015 has been established. The strength and variety of scientific thrusts covered by more than 20 approved user projects ensure that the experimental program at ATF continues to excel. In November, the ATF supported parallel runs of two experiments. One of them, Dielectric Waked Field Acceleration by Euclid Technolab company used a tightly focused 70-MeV electron beam transmitted through a variety of dielectric structures. Another experiment conducted by scientists from the Naval Research Laboratory explored a novel method of MeV proton beam generation using a combination of two lasers of different wavelength focused on a supersonic hydrogen jet. Both experiments produced new scientific outcomes within or beyond expectation that will be presented at upcoming international meetings.

The ATF-II Stage 1A Conceptual design and floor plan layout has been frozen and a detailed design of the shielding is being prepared. Recommendations made at the ATF-II Upgrade workshop in October are being incorporated into the design and efforts are proceeding to prepare for the move of equipment from the Source Development Laboratory (SDL) in building 729 to their new locations for use in ATF-II in building 912.

Energy Recovery Linac:

We got beam from Cs₃Sb cathode in 704MHz SRF gun. This is an important milestone in the commissioning of the unique gun and the ERL. The electron beam was observed on just the second attempt. The cathode quantum efficiency (QE) was continuously if slightly improving during the beam test. We also rejuvenated the cathode by heating after the cathode was accidentally exposed to a poor vacuum (high-10⁻⁷ torr). 80% of the pre-accident QE was recovered by controlled heating of the cathode. An image of the beam on a beam profile monitor is shown in the photo below. Light seen out of the beam area is a reflection of the photocathode laser light.



Beam on profile monitor

Energy Frontier Accelerator Group:

Ionization cooling is believed to be the only method fast enough to reduce the emittance of muon beams. The MICE experiment (Muon Ionization Cooling Experiment) aims to demonstrate ionization cooling experimentally and is presently setup at the Rutherford Appleton Laboratory in the UK.

About two years ago it was noticed that the large bore superconducting solenoids produce a substantial stray magnetic field; this stray magnetic field is so large that it jeopardizes the operation of the MICE experiment. Holger Witte of the Energy Frontier Accelerator Group has developed a concept, called Partial Return Yoke (PRY), to mitigate this. The PRY is a retro-fitted flux return yoke which reduces the stray magnetic field in the MICE hall to tolerable levels. The PRY for MICE Step IV is currently under construction; the support structure is finished and awaiting shipment to the UK. 55 tons of good quality iron were procured and are on their way to the vendor for machining. It is anticipated that the MICE PRY project will be finished on time for the commissioning of MICE next year.

ARRIVALS: Welcome!

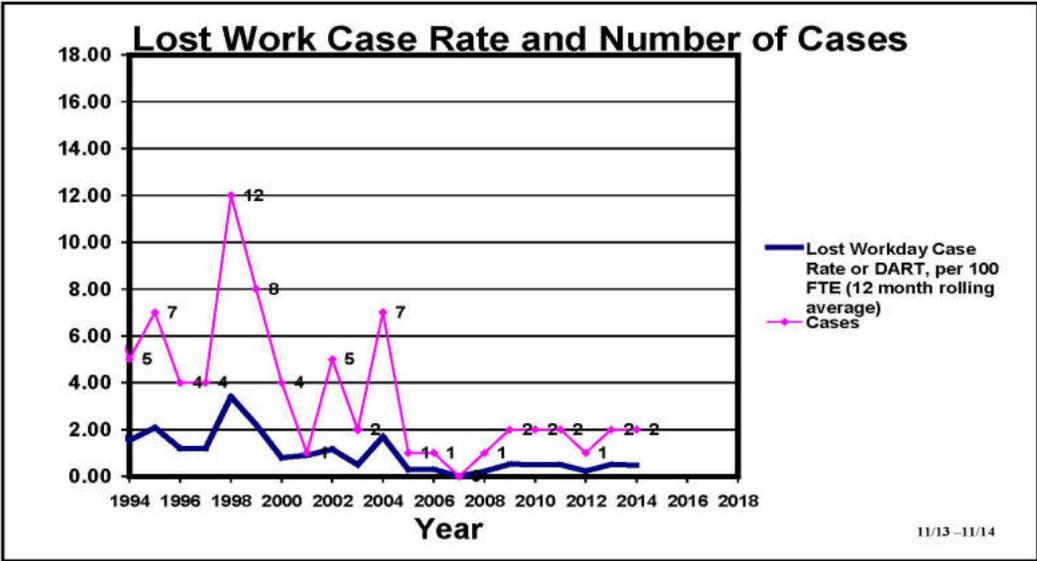
April Spencer (Administrative Services Assistant), working with Ann Lamberti, started Nov. 10, 2014.
 Alex Burkhart (Physics Associate IV), Working with Peter Ingrassia, started Nov. 17, 2014.
 Jason Taibi (Physics Associate IV), Working with Peter Ingrassia, started Nov. 17, 2014.
 Khianne Williams (Project Management Specialist) Working with Kerry Mirabella, started Dec. 1, 2014

DEPARTURES: Farewell, you will surely be missed..

Mei Bai - Last day was Nov. 24, 2014
 Michelle Wilinski - Last Day was Dec. 5
 Bart Frak - Last day is Dec. 31, 2014
 Suresh Srivastava - Retiring January 2, 2015.

Guest Notices:

SAFETY STATS: Peter Cirnigliaro



C-AD Occupational Injury Statistics

	For Year 2013	For Year* 2014
First Aid Cases	5	8
Recordable Cases	3	2
Lost Work Cases	2	1

* Calendar Year through 11/14