

Particle Post March 2010

*"...the
greater part of
our happiness
or misery depends
on our
dispositions
and not on
our
circumstances."
~Martha Washington*

Previous issues

Note from the Chair



The RHIC run is proceeding very well with new record luminosities almost every week. However, whereas other colliders would continue to run in the same mode for many months or years, RHIC is already getting ready to change to a lower energy. This flexibility and the fast changeovers have become a hallmark of RHIC. A critical component to the quick development of new RHIC acceleration ramps are the multiple feedback systems that were been pioneered here at RHIC by Peter Cameron. Over the last weeks Michiko Minty, Al Marusic et al. have demonstrated, for the first time, simultaneous feedback of the betatron tune and coupling, orbit correction and even chromaticity. Congratulations for this outstanding achievement. The feedback systems will be very useful as we are planning to run at five different collision energies during the remainder of

this running period.

Administration



On a day-to-day basis, operational issues can be all consuming and it is easy to lose site of the bigger picture which, at the moment, is bright.

Carryover from FY 2009 enabled us to commence operations early in the fiscal year and conservative estimates for FY 2010 confirmed adequate funding to support a 27 week run. Most recently, a decision to extend the run by 2 weeks to 29 weeks was made possible by stable power cost at lower than projected rates.

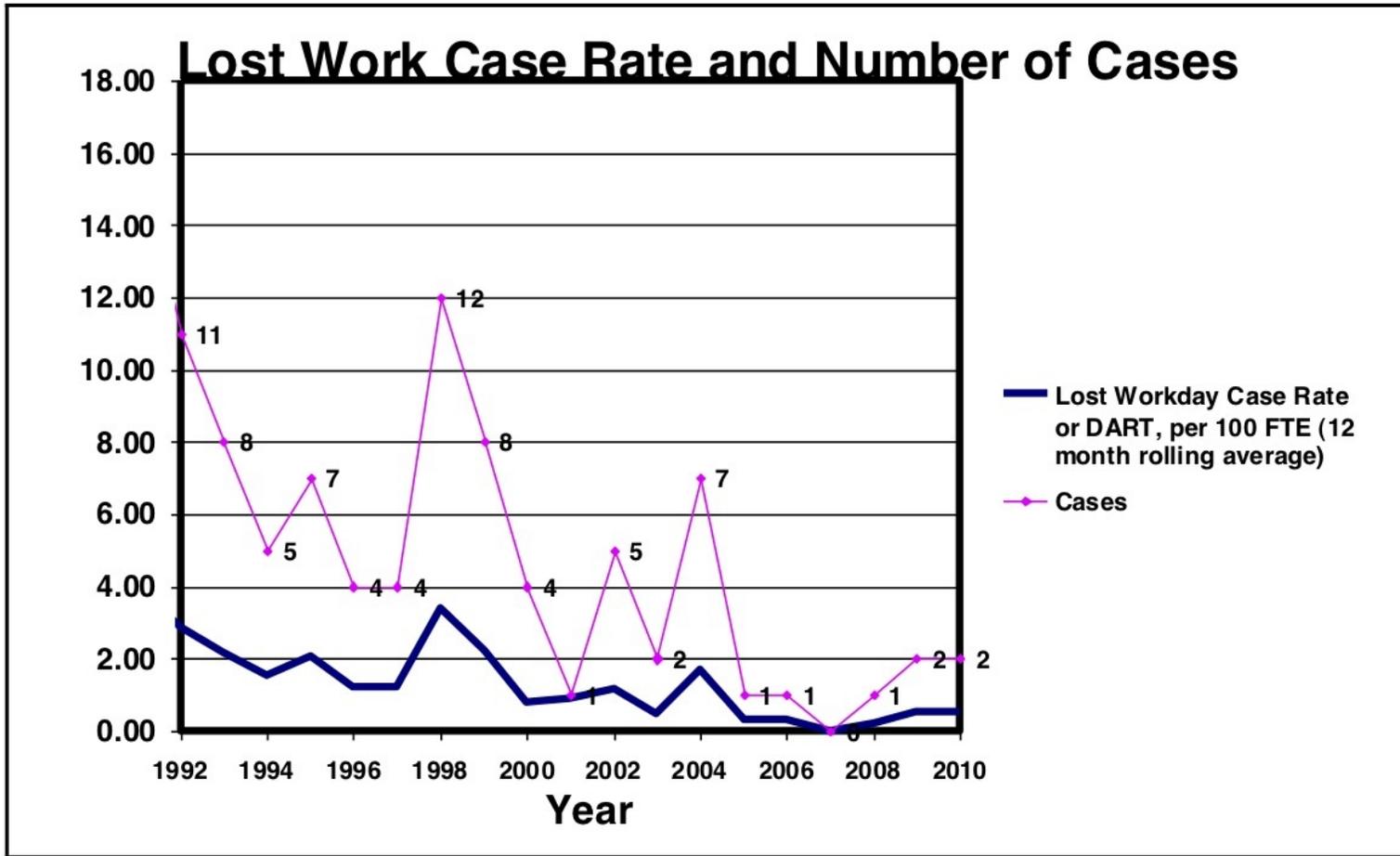
Funding for accelerator improvements, which has been minimal since the inception of the EBIS project, has been restored to pre-EBIS levels and a number of major initiatives, including development of the 56 MHz SRF system and completion of the Main Control Room Upgrade, are in process.

Looking at current year cost and commitment, it is clear that much of the facility is physically inaccessible and staff are fully engaged in operations. Trade labor in February was 40% less than in November, the month preceding cool down and purchase order activity, as measured by the change in cost plus commitment, was \$400K less in February than in the prior month.

On the manpower front, nearly 70 new faces have joined C-AD over the past 18 months resulting in a net increase in staff of ~ 30. This has literally changed the face of our work force as the average age declined for the first time in a decade. Additionally, total salary cost for the Department is increasing at a rate below DOE escalation as the proportion of senior staff, in all job categories, is diminishing.

In summary, we have a strong program that is adequately supported and are actively involved in upgrades to the facility and mentoring of new staff. FY 2010 may very well replace FY 2005 as a bench mark year for RHIC.

Safety Stats



C-AD Occupational Injury Statistics

For Year* 2009

For Year* 2010

First Aid Cases	5	0
Recordable Cases	2	1

Lost Work Cases

2

0

* Calendar Year

REMINDER: TLD exchange is done the *FIRST FRIDAY* of the Month.

EXCHANGE DATE: FRIDAY, APRIL 2, 2010

Pete Cirnigliario



RHIC Newsletter. Please click on link to the left to view the latest web publication of RHIC News.



*We wish all of you born in **March**
a happy and healthy year ahead.
Birthday people **ONLY** click on cake*



Get To Know Your Co-Worker

Larry Hoff, Accelerator Controls, has worked at BNL for 25 years. Larry and his wife Becky have 2

children, Sam (15) and Emily (13). Larry enjoys hiking, skiing, windsurfing, and trying to learn to speak French "J'aime faire le ski, le randonnee, et le planche a voile." Larry's French course is taught though the BNL ESOL program. This year's family ski trip was to Vail, Colorado. Larry doesn't have any pictures to share because the sun never cooperated. Instead it was overcast and snowed every day.



Larry hiking with his wife and children in England's "Lake District".



Larry, his brother and sister at the summit of Mt. Ranier, near his brother's house.



Larry windsurfing at Crab Meadow Beach in Northport.



Fun Time

Place your bets on your favorite colored crab in a virtual crab race. Each crab has different odds and has different payouts. Good Luck!

Free JavaScripts provided
by [The JavaScript Source](#)



Did You Know

THIS MESSAGE IS BEING SENT ON BEHALF OF THOMAS ROSER (2/16/10):

In the new Accelerator R&D Division, a new “Accelerator Physics R&D Group” is being formed replacing the existing “eRHIC R&D Group.” Vladimir Litvinenko will lead this new group. Mike Blaskiewicz has agreed to lead the present “Accelerator Physics Group” in the Accelerator Division.

The membership of these two groups has a large overlap reflecting the need for everybody’s involvement in both operations and the R&D efforts.

Contacts: [Diane Greenberg](#), (631) 344-2347 or [Peter Genzer](#), (631) 344-3174

Brookhaven Lab's Mei Bai Awarded Early Career Prize for Accelerator Research Achievements

February 19, 2010



Mei Bai

UPTON, NY — The Asian Committee for Future Accelerators and the organizing committee of the 2010 First International Particle Accelerator Conference (IPAC'10) have awarded Mei Bai, a scientist at the U. S. Department of Energy's Brookhaven National Laboratory, a prize for her significant and original contributions to the field of accelerator research during her early career. She will receive the prize, which consists of 300,000 Japanese yen (about \$3,000) and a framed certificate, at IPAC'10, which will be held in Kyoto, Japan, May 23 - 28.

"I am very honored to receive this prize," Bai said, "but keeping Brookhaven's accelerators running smoothly for polarized proton experiments is really a team effort. I've had the privilege to expand my understanding of accelerators with the help of many knowledgeable and creative colleagues at the Laboratory. This award is as much theirs as it is mine."

Bai was cited "for her significant contributions to spin dynamics and polarized proton acceleration in circular accelerators – in particular AGS [[the Alternating Gradient Synchrotron](#)] and RHIC [[the Relativistic Heavy Ion Collider](#)], and to successful polarized proton beam collisions at 500 GeV [giga electron volts] centre of mass."

In the 1990s, Bai and collaborators devised a way to keep protons in an accelerating beam "polarized," or all spinning with their axes in the same direction. The technique was successfully demonstrated at Brookhaven's AGS, an accelerator that is a key part of the RHIC complex. Physicists from around the world study polarized protons at Brookhaven's RHIC to determine the answer to a fundamental question – how protons get their spin, an intrinsic property of the particle that is not completely understood.

Bai and collaborators found that adding a radio-frequency (RF) dipole magnet to an accelerator could counteract the effect of focusing magnets that interfere with the polarized protons' alignment. Like a child pushed on a swing, the protons are pushed, or "kicked," as they speed through the accelerator at nearly the speed of light. This kick destroys their natural alignment, but the kick from the RF dipole produces a frequency that keeps the protons' spin aligned, both horizontally and vertically, which is necessary for experiments.

Recently, Bai has focused on the RHIC polarized proton program. In 2004, 2005 and 2009, she was the RHIC polarized proton run coordinator, which requires her to make sure that all systems are working at optimum level in the accelerator, which is the world's largest dedicated to nuclear physics. "As a run coordinator, it was my daily duty to coordinate all of the operations to deliver a polarized proton beam that met the requirements of the experiments," Bai said. "I was also responsible to organize the efforts to troubleshoot when problems developed. During that time, I was on call 24 hours per day. It was tough, but was fun and a very rewarding experience"

Bai earned a bachelor's degree in engineering from the University of Electronic Science and Technology of China, Chengdu, China, in 1989; a master's degree in physics from the University of Science and Technology, Hefei, China, in 1992; and a Ph.D. in physics from Indiana University in 1999. She joined Brookhaven Lab in 1999 as a research associate in the RHIC Accelerator Physics Group, was promoted to associate scientist in 2001, and to scientist in 2004. Bai was the recipient of the American Physical Society's Outstanding Doctoral Thesis Research in Beam Physics Award in 2000.

RHIC Run 10: Status and Plans

By Kevin Brown



Kevin Brown

Run 10 at RHIC started just before midnight on December 31, 2009. While the ball was dropping in Times Square on New Year's Eve, we were putting beams into collisions so that the STAR and PHENIX detectors could begin collecting data. With Run 10, RHIC enters a new regime of operation, creating the most intense ion beams ever seen at the facility. With this run we are breaking many records and pushing the boundaries of accelerator science.

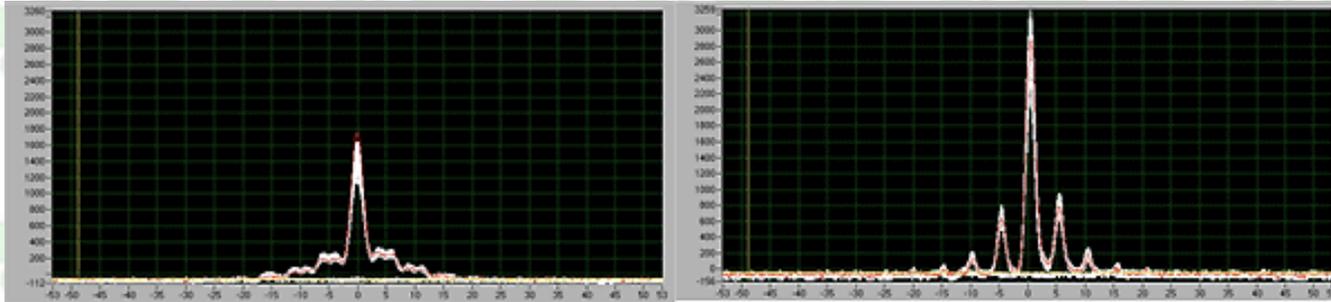
Ten years ago, RHIC started operation as a unique kind of collider, the first to collide beams of heavy ions. RHIC is composed of two accelerators woven together, crossing at six interaction points. This means we have two, more-or-less-independent accelerators to set up and keep running. It also means that RHIC has many capabilities that make it the best instrument in the world for studying nuclear matter at very high temperatures and densities. Note the recent news on RHIC results mentioned in this issue.

As one of the main centers for accelerator science in the world, RHIC also is an important accelerator to use for the study of the physics of particle beams. RHIC has been host to a long tradition of accelerator-physics experiments, and the fruit of these studies is higher luminosity beams for the experiments.

This year, new ideas that were tested in accelerator-physics experiments are being implemented in routine operations, bringing luminosities to the highest levels ever achieved at RHIC. These include bunched-beam stochastic cooling, various lattice optics modifications to avoid instabilities, and new and improved

feedback systems to more effectively control the optics and variations of the ion beam orbits.

As described in [an earlier article](#), stochastic cooling is providing STAR and PHENIX with higher collision rates. The results of cooling are impressive, as seen in the figure below.



Stochastic cooling in action. The image on the right is a RHIC bunch that has been cooled for a few hours. The image on the left is a RHIC bunch without any cooling.

Techniques to keep the beams as small as possible usually focus on keeping the beams from growing – in the processes of accelerating them, bringing them into collision, and keeping them colliding. In accelerator physics experiments, we have found ways to adjust RHIC optics to reduce beam-size growth. We also made improvements in the collision optics, making the beams smaller and increasing the luminosity.

With Run 10, we have already broken instantaneous luminosity and integrated luminosity records. In addition to the innovation of bunched beam stochastic cooling, we have used additional feedback systems that make RHIC startup faster and improve the stability and reproducibility of operations.

We have a few weeks left before we finish the 200-billion-electron-volt gold-on-gold portion of the Run 10 program. We will then embark on a program of low-energy collisions, allowing the experiments to begin the study of the quark-gluon-plasma phase transition. We will operate RHIC at progressively lower energies, even going to energies below the normal injection energy. We are looking forward to both STAR and PHENIX producing new and interesting results as we continue the push to provide for them the best possible beam conditions.

– Kevin Brown
RHIC Run 10 Coordinator
brownk@bnl.gov

Nicholas Samios inducted into the L.I. Technology Hall of Fame.

I-Hung Chiang's Son Jay Married Cindy on March 2 at the Cal-Tech Athenaeum Club. Here are a couple of photos:





We have learned that Jim Sanford, former AGS Department chair, passed away this morning. A memorial service will be held sometime in the near future; details of the service will be circulated when received.

Kerry Unger, Controls Section passed away on February 17th. There was a memorial service held at Robertaccio's Funeral Home in Patchogue on February 20th. A gift in the Honor of Kerry Unger has been made to The American Cancer Society from C-AD friends and co-workers at BNL.



The Food Pantry needs our help.....

If everyone can bring in at least one non-perishable food item, this would help the local food pantries in our area. There are so many families who are in need of food and depend on their local food pantry to have at least one meal a day. With the food supply so low, the volunteer's who help out at our local food pantries can't help those in need. So please.....bring whatever you can to replenish the food supply for those in need.

Your donation of any non-perishable food item can be left in the box marked "Food Drive" located in the 911A Lobby. Your continued support is appreciated.

Thank you.

PLEASE NOTE:

The on site gas station is now fully open for car servicing and inspections and is pumping gas. Stop by & meet Pete & his staff!

*. Introducing BERA Children
CAMP for the school break on March
29-April2, 2010.*

' s MINI

SPACE IS LIMITED!!!! For

*information/details &
requirements, please call Ext.
5090, or go to*

<http://www.bnl.gov/bera/recreation/forms.asp>

*. SUMMER CAMP EXPO WILL BE AT
Berkner Hall 488 on Thursday March
11, 2010. Stop in for BERA Summer
Camp information as well
as information on other area camps.*

*. DANCE AT BNL! Register now for
the BERA Ballroom Dance Club
new series!*

http://www.bnl.gov/bera/linkable_files/BallroomDance2-17-10.pdf

*. NY Knicks vs. Denver Nuggets
Tuesday, March 23, 2010 at Madison
Square Garden Game at 7:30pm Section
310 (Only 50 tickets). The coach
bus will leave Brookhaven Center at
4pm and leave Madison Square Garden
at the end of the game,
approximately 10pm. Cost is \$55
per person and includes coach bus
and ticket.*

[New York Knicks](#) ~

[Official Website of Madison Square Garden](#)

*NOTE Amer. Museum of
Natural History & the
Philadelphia Flower Show are*

[SOLD OUT](#)

. FITNESS AT BNL

<http://www.bnl.gov/bera/recreation/fitness.asp>

*join in for Swimming, Yoga,
Kick Boxing, Aqua Aerobics,
Aerobics, and more!*

- *BNL Play Group* www.meetup.com and request membership in the BNL Play Group! great family information, social gathering & networking, and more!
- *BERA Elections will take place during the week of April 5-9, 2010. Interested in Serving on the BERA Board? Contact a member of the Nominating Committee!* <http://www.bnl.gov/bera/recreation/election.asp> or call Ext. 5090
- *SPRINT/NEXTEL will be in Berkner 488 on March 10 offering discounts on cell phone plans.*

FUTURE PROGRAMS WILL INCLUDE ATLANTIC CITY, BROOKLYN BOTANIC GARDEN, BROADWAY & MORE!

SUGGESTIONS ARE WELCOME!

BERA March Mini Camp, fitness, and more!

<http://www.bnl.gov/bnlweb/pubaf/bulletin/default.asp>

3 New BERA Trips added for the Spring-all on sale beginning Friday 3/5:

~International Auto Show Saturday April 10, 2010 at the Javits center, NYC \$20 PP. Leave Brookhaven Center at 9am, the show at 4:30pm

~ Atlantic City Saturday April 17, 2010- Taj Mahal on the Boardwalk. Cost

is \$25pp, get \$25 in Slotplay on Arrival. Leave Brookhaven Center at 9am, leave A/C at 8pm.

~Brooklyn Botanic Garden Saturday May 1, 2010 Cherry Blossom/Hanami Festival. Leave Brookhaven Center at 9am, the gardens at 4:30pm \$20PP



ALUMNI NEWS: AGS/RHIC/C-AD RETIRED CROWD - We'd enjoy hearing from you and what you have been up to. Please send your notes to pmanning@bnl.gov

You can catch up on all of Eric Forsyth's travels by clicking on his sailing yacht below.



March 2010



Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	Economist Robert J. Shiller to speak on 'How Human Psychology Drives the Economy', 4pm, Berkner	3 C-AD AP Seminar 'Applications of Linacs in the Medical Field', Dr. Samy Hanna, 3pm, Bldg. 911B LCR	44		6 Middle School Science Bowl, 9am Berkner
77		9 Physics Colloquium 'Lattice QCD and Particle Physics', Andreas Kronfeld, FNAL, 3:30pm, Bldg. 510 Large Seminar	100	11	12	13
14 Daylight Savings Time Begins	15	16	17  Violist Jennifer Stumm to perform, Noon, Berkner	188	19	20 Spring Begins

21	22	23 Physics Colloquium 'Inflation and dark matter in the standard model of the universe', Hector de Vega, U. of Paris, 3:30pm, Bldg. 510 Large Seminar	24	25	26 Guitarist Frank Vignola to perform, 8pm, Berkner
288 Palm Sunday	29	30 Passover	31		



April 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 April Fool's Day	2 Good Friday	3
4 Easter		6 Physics Colloquium, 'Neutrinos', Mary Bishai, BNL, 3:30pm, Bldg. 510 Large Seminar	7		9 Physics Colloquium, 'Results from Minos Experiment Electron Neutrino Appearance Analysis', Lisa Whitehead, BNL, 3:30pm, Bldg. 510 Large Seminar	10

11 Holocaust Remembrance Day	12	13	14	15	16	17
18		20 Physics Colloquium, 'TBD, Elizabeth Simmons, MI State U., 3:30pm, Bldg. 510 Large Seminar	21 Administrative Professionals Day 456th Brookhaven Lecture 'Getting more from less: correlated single-crystal spectroscopy and x-ray crystallography at the NSLS' 4pm, Berkner	22 Earth Day	23	24
25	26	27 Physics Colloquium, 'Intracellular networks in bacteria', Ned Wingreen, Princeton U., 2pm, Bldg. 510 Large Seminar	28	29	30	



**We Remember
Trade Center**

USS New York - A ship forged from the steel of the World

Sept. 11, 2001

Editor: *Pamela Manning X4072*