

Particle Post April 2006

Small opportunities are often the beginning of great enterprises.

~Demosthenes

To review previous issues

A Note From Our Chairman



I am delighted to see that our safety record continues on for 446 days, as of March 28, without a lost workday. We have also experienced no injuries for this year, although there was one confirmation of a hearing shift of one of our colleagues. This should warn us all to wear hearing protection in designated areas and to reduce the music volume at home or in the car. Keep up the great work.

On the materials security front, we are instituting some new elements into the way we do business. Later in April we will have an all-hands meeting to discuss what is new. In addition, I sent everyone a memorandum asking for input on a strawman proposal on staff accountability. I received an excellent response and many constructive and useful suggestions. The next step will be to formulate a policy that we can all agree to.

On behalf of C-AD, I would like to congratulate Dr. Rama Calaga on recently receiving his PhD in Accelerator Physics from Stony Brook University. Ilan Ben Zvi and Steve Peggs were Rama's thesis advisors. In addition, Rama has recently received the Stony Brook University President's Award to Distinguished Doctoral Students. More later in this issue of Particle Post. Congratulations again.

On the operations front we have brought RHIC on to physics status faster than ever before and the physics program is well underway. The NSRL is well on its way to completing run 6A by April 7.

We were all delighted to have Jim Simons and some of his partners visit us on March 9. He was very taken with everyone who came to the Snyder Seminar Room to thank him

personally for his gift. He very much enjoyed his visit to the MCR where he had the opportunity to learn something about the accelerator complex, to initiate the beam coggging process for collisions and then observe the events being collected by the STAR TPC detector.

Administration



The RHIC operations budget for FY 2006, including the \$12.0M pledged by the Stony Brook Foundation, is \$105.5M, an increase of nearly \$4.1M over last years budget of \$101.4M. At the half-way mark, year-to-date expense for RHIC operations is \$46.3M and open commitments are \$4.8M. Total cost and commitment of \$51.1M is 48% of our total operating funds.

Electric power rates appear to have stabilized and for the past three months have been considerably lower than the \$100 per MWH we had estimated. Thus, the cost of power for RHIC Run 6 has, so far, been considerably lower than estimated. Our new contract with NYPA, however, poses significantly greater risk to the Laboratory than earlier contracts.

Electric power rates fluctuate hourly. A spike in the rate during operations could be very costly and quickly consume our accumulated savings. Of particular concern is a provision in the contract that imposes penalties at the rate of \$90K per MWH should a BNL demand peak coincide with a LIPA system wide demand peak. We are most vulnerable to invocation of this contract clause during the final weeks of Run 6 and will, therefore, be watching the weather carefully in June.

So, do we have money or not? At the moment, our funding is adequate. Selected purchases for next fiscal year may be advanced and essential staff increases considered. We should, however, proceed cautiously, as volatility in the power rate during the remainder of Run 6 may require that we adjust our plans. Stay tuned!

Machine Update



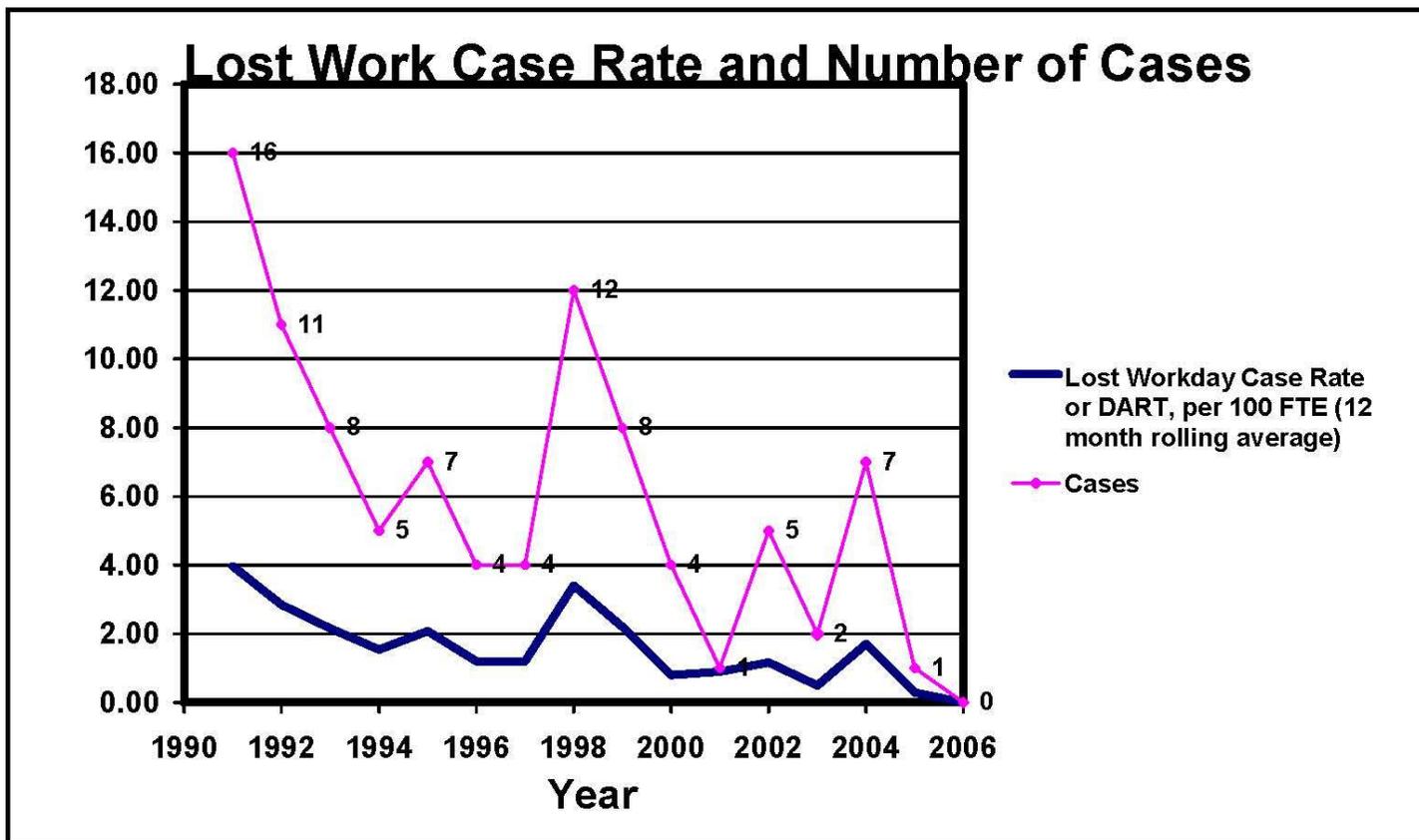
RHIC is now in its 5th week of physics running with polarized protons, and while I am writing, development is in progress in MCR to reconfigure the direction of polarization in STAR from longitudinal to transverse for a different physics running mode in the experiment. Both figures of merit for the physics stores, luminosity and polarization, exceeded the performance that we achieved during the last P-P run, with measured polarization at store between 50 and 60% and initial record collision rates of 8 KHz,

corresponding to a peak luminosity of $\sim 2 \times 10^{31} \text{ cm}^{-2} \text{ sec}^{-1}$. The 10% cold snake configuration in the AGS improved the polarization from the injectors. The AP experiments program is progressing well.

In the last 2 weeks the challenge has been uptime, operations continuity having been affected by different system failures that took a rather long time to recover from. We are working hard to address these issues in the short term (this run) and long term (next runs).

NSRL continued running its program and the end of the present run is scheduled for April 7. Likewise, BLIP has been running this month in parallel with RHIC P-P operations.

Safety Stats



C-AD Occupational Injury Statistics

For Year* 2005 For Year* 2006

F01 Year = 2005

F01 Year = 2006

First Aid Cases	1	3
Recordable Cases	4	1
Lost Work Cases	1	0

* Calendar Year

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

NEXT EXCHANGE: Have your TLD on its assigned badge board by

Friday, MAY 5, 2006

Pete Cirnigliaro



Arrivals

Carl Anderson joined the Main Control Room working with Peter Ingrassia on April 3.

Nancy Boyle will be joining the Administrative Group working with John Brinker on April 10.

Indiana University students, Y. Hao and Q. Wu returned to C-AD on April 1 after spending one month at the NSLS.

WELCOME!!

Departures

Kristine Ferrone, Machine Operations Group will be leaving BNL on April 14.

Lin Jia, Cryogenic Systems Group will be leaving BNL on April 7.

John Stehle, Cryogenic Systems Group left BNL on March 31.



Get To Know Your Co-Worker



Rama Calaga works in the Accelerator Physics Group and is working on projects like RHIC Beam Dynamics (linear optics, coupling, ...) and Superconducting RF Cavities for RHIC II (electron cooling) and has been at the Lab for over 3 years now. He enjoys skiing, motorbiking, hiking and kayaking in his spare time.

Ram was awarded the Stony Brook University President's Award for Distinguished Doctoral Students under the criterion that his dissertation and its research base are of outstanding merit.

Ram carried out his thesis work at Brookhaven National Laboratory under the joint advisorship of Profs. Ilan Ben-Zvi and Stephen Peggs. He has completed course work at Stony Brook with a 3.7/4.0 GPA, and successfully completed his qualifying examinations in 2002. He defended his thesis successfully on March 16, 2006. He has been working with Ilan Ben-Zvi on superconducting

RF R&D for the electron cooling project at RHIC and under Steve Peggs on RHIC beam dynamics issues.

Under the electron cooling topic, Ram developed the design of the 5-cell superconducting cavity, first of its kind for very high current electron linacs in energy recovery mode. This type of energy recovery linac is essential for the execution of the electron cooling project, which will start soon at BNL to the tune of about 80 million dollars. Ram is proficient in several numerical codes like MAFIA which he used to optimize the cavity design and study the behavior of Higher Order Modes (HOMs), and effectively damp them to improve the performance of the cavity. Ram studied the effects of the HOMs on the beam using numerical methods to determine instability threshold for beam breakup in energy recovery linacs. On the measurement side, Ram carried out extensive measurements on copper prototype of the cavity using network analyzer, bead-pull and other RF techniques for cavity tuning, and benchmark simulations results from numerical codes. Then Ram studied several issues critical for SRF cavities like multipacting, Lorentz force detuning, and fundamental power coupler. Currently Ram is investigating the possibility of coupling two 5-cell cavities and is studying the feasibility of such superstructures. This is of great interest for future high current linacs.

In addition, Ram designed the high current superconducting RF photo-injector cavity used as the electron source. Working closely with the beam dynamics team, he was able to develop an optimized SRF gun to rapidly accelerate low energy electrons and preserve the beam emittances. He carried out intensive numerical calculations to develop an “elliptical pringle tip” for the fundamental coupler to overcome the strong coupling requirements while minimizing wakefield and coupler kick effects. Ram performed several calculations to establish multipacting field levels, and laser stability requirements.

Under the RHIC beam dynamics subject, Ram worked on the collider, doing various outstanding beam-based accelerator physics experiments on transverse beam dynamics. He performed an extensive study on the performance of RHIC beam position monitors, critical devices for RHIC operation.

He developed a statistical technique using sophisticated numerical methods to overcome the difficulty of analyzing the large number of detectors and observe possible trends to identify the sources of malfunction. He developed new techniques to accurately measure linear optics and apply a new beta-bump correction technique to compensate for quadrupole imperfections and minimize beta beating. Using RHIC AC Dipoles, he was able to measure linear lattice parameters which will aid in the development of an accurate RHIC model and ultimately improve the performance of the collider. He developed a new technique to locate transverse coupling sources and successfully carried out several numerical studies and experiments to identify transverse coupling sources and establish precise compensation strengths for the local correctors.

Ram served as a RHIC shift-leader, given responsibility to operate the twin 3.8 kilometer circumference superconducting rings of RHIC for users. His publications list is very extensive. Many of the research items he completed were published in high impact journals such as Physical Review, most of which derived from his ideas and initiatives. He

is also a recipient of IEEE/NPSS student award and has obtained a Large Hadron Collider Accelerator Research Project Toohig Fellowship position waiting for the time he finishes his BNL work.

Here is a 5 minute video explaining what Ram is doing here at BNL along with a couple of other interesting items. [take5_04-05.rm](#)



Patricia O'Grady, Vacuum Systems Group, is a Grandmother again, here is a photo of her 6th grandchild Abigail Iris born February 8, weighing 8 pounds and 21" long.



Did You Know?

EASTER

[Christian Origins] Easter is the annual festival commemorating the resurrection of Jesus Christ, and the principal feast of the Christian year. It is celebrated on a Sunday on varying dates between March 22 and April 25 and is therefore called a movable feast. The dates of several other ecclesiastical festivals, extending over a period between Septuagesima Sunday (the ninth Sunday before Easter) and the first Sunday of Advent, are fixed in relation to the date of Easter. Connected with the observance of Easter are the 40-day penitential season of Lent, beginning on Ash Wednesday and concluding at midnight on

Holy Saturday, the day before Easter Sunday; **Holy Week**, commencing on Palm Sunday, including Good Friday, the day of the crucifixion, and terminating with Holy Saturday; and the **Octave of Easter**, extending from Easter Sunday through the following Sunday. During the Octave of Easter in early Christian times, the newly baptized wore white garments, white being the liturgical color of Easter and signifying light, purity and joy.

[Pagan Origins] Easter, a Christian festival, embodies many pre-Christian traditions. The origin of its names is unknown. Scholars, however, accepting the derivation proposed by the 8th century English scholar St. Bede, believe it probably comes from Eastre, the Anglo-Saxon name of a Teutonic goddess of spring and fertility, to whom was dedicated a month corresponding to April. Her festival was celebrated on the day of the vernal equinox; traditions associated with the festival survive in the Easter rabbit, a symbol of fertility, and in colored Easter eggs, originally painted with bright colors to represent the sunlight of spring, and used in Easter-egg rolling contests or given as gifts.

The Christian festival of Easter probably embodies a number of converging traditions; most scholars emphasize the relation of Easter to the Jewish festival of Passover, or Pesach, from which is derived Pasch, another name used by Europeans for Easter. The early Christians, many of whom were Jewish origin, were brought up in the Hebrew tradition and regarded Easter as a new feature of the Passover festival, a commemoration of the advent of the Messiah as foretold by the prophets.

[Easter Symbols] Eastre (or "Ostra"), the Anglo-Saxon Teutonic goddess of spring and fertility was often accompanied by a hare when represented. The fertile nature of rabbits and hares is another symbol of new life and the rebirth that occurs during the spring season. Also, German settlers in American are said to have brought over the tradition of a bunny named "Oschter Haws" who would visit houses on Easter eve, leaving colored eggs for children. Christians later used eggs to symbolize the rebirth of Christ. Another Easter tradition is the eating of Hot Cross Buns. These cakes were marked by the Saxons to honor Eastre, the fertility goddess. The crosses on the buns are said to represent the moon's quarters, while Christians see the cross as a reference to the crucifixion.

PASSOVER

Important Jewish festival commemorating the exodus of the Israelites from Egypt and their safe flight across the Red Sea. This flight, described in the Book of Exodus, was led by Moses. The name of the festival (Heb. pesah, "passing over" or "protection") is derived from the instructions given to Moses by God. To encourage the Egyptians to allow the Israelites to leave Egypt, God intends to "smite all the first-born ... both man and beast" in the land. To protect themselves, the Israelites are told to mark their dwellings with lamb's blood so that God can identify and thus pass over them. The celebration of the holiday begins after sundown on the 14th day of Nisan, the first month of the Jewish ecclesiastical year, about the time of the vernal equinox. In accordance with rabbinic law, Jews living outside the limits of ancient Palestine celebrate the holiday for eight days and partake of a

ceremonial meal, known as the Seder, on the first two nights. The Seder consists of prescribed foods, each of which symbolizes some aspect of the ordeal undergone by the Israelites during their enslavement in Egypt. For example, horseradish signifies the bitterness of the experience, and a mixture of chopped nuts and apples in wine symbolizes the building mortar used by the Israelites in their forced labor. During the Seder the narrative of the exodus is recounted and prayers of thanksgiving are offered up to God for his loving protection.

The readings, songs, and prayers of the Seder are contained in the HAGGADA, copies of which are available for all at the table. Jews living within the limits of ancient Palestine celebrate Passover for seven days, conducting a Seder only on the first night.

Throughout the holiday the Orthodox Jew must abstain from eating leavened bread, substituting unleavened bread, usually in the form of matzoth. These matzoth recall the unleavened bread eaten by the Israelites during their flight because they had no time to prepare raised bread. Orthodox Jewish tradition prescribes that, during Passover, meals be prepared and served using sets of utensils and dishes reserved strictly for that festival.



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

That means also YOU: Marion, Mei & Thomas

Happy Birthday!!!





C-AD Service Awards March

35 years

John Nicoellis

20 years

J. Michael Brennan

10 years

Matthew Kessler

Congratulations to ALL!



Spring Has Arrived



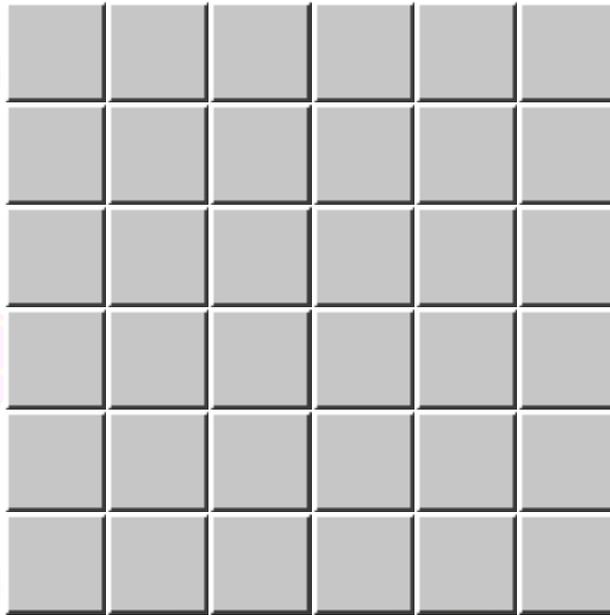
Pussy Willow on Brookhaven Avenue

Mourning Cloak on Fifth Avenue

(although these pictures were taken by James Osterlund in the beginning of March.)

Fun Time

Concentration



Free JavaScripts provided
by [The JavaScript Source](http://www.javascriptsource.com/)



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

Greetings from Irving and Irma Montanez. Here are some photos of their home

and countryside view in Puerto Rico. The weather has been great so far, but it hasn't rained for the past 2 months.



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





April 2006

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2 Daylight Savings Time Begins	3	4	5	6 Diabetic Nutrition, Berkner, Room B, 12:00-1:00pm	7	8 Ringling Bros. & Barnum Bailey Circus, Madison Square Garden
9 Palm Sunday	10	11 Elder Law Lecture, Berkner, Room B, 12:00-1:00pm	12	13 Passover	14 Good Friday	15

<p>16</p> 	<p>17</p>	<p>18</p>	<p>19</p> <p>Department Meeting 11:00-12:00pm Snyder Seminar, Bldg. 911A</p> <p>414th Brookhaven Lecture "Of Boys and Girls and Bumps on the Head", A. Biegon, Medical Dept., 4pm, Berkner Hall</p>	<p>20</p> <p>Diabetic Nutrition, Berkner, Room B, 12:00-1:00pm</p> <p>Annual Earth Day Ceremony 3:30pm Berkner Auditorium</p>	<p>21</p>	<p>22</p>
<p>23</p>	<p>24</p>	<p>25</p>	<p>26</p> <p>Administrative Professionals Day</p>	<p>27</p> <p>Take Our Daughters & Sons to Work Day</p>	<p>28</p>	<p>29</p>
<p>30</p>						



May 2006

Sunday Monday Tuesday Wednesday Thursday Friday Saturday

	1	2	3 AP Seminar, "Demonstration of Principle of CRFQ" D. Davino, 4pm, LCR	4	5 AP Seminar, "Smart Actuators/ Sensors on Magneto- dastic Materials" D. Davino, 4pm, LCR	6 Haru Matsuri - A Japanese- American Friendship Spring Festival, Berkner Hall, 10am- 4pm
7	8	9	10	11	12	13
14 Mother's Day	15	16	17	18	19	20 Armed Forces Day
21	22	23	24	25 Elder Law Lecture, Berkner, Rm B, 12:00- 1:00pm	26	27
28	29 Memorial Day	30	31			



We Remember
Sept. 11, 2001

Editor: Pamela Manning x4072

