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BROOKHAVEN NATIONAL LABORATORY

Gold Beam Zips Through First Completed Stretch Of RHIC During Historic, Successful Sextant Test

Roger Stoutenburgh

In the main control room at the Alternating Gradient Synchrotron (AGS), where the gold-ion beam was guided from the AGS to the end of the first sextant of the Relativistic Heavy Ion Collider, are: (clockwise from far left) James Rose, Robert Frankel, Peter Wanderer, Waldo McKay, Michael Brennan, Michael Harrison, Ted Robinson, Michael Anerella, Tom Shea; (center, from left) Thomas Roser and Steve Peggs.

Roger Stoutenburgh

In the RHIC Cryogenics System Section control room, overseeing the operation of the huge refrigerator that cools RHIC's superconducting magnets, are: (front, from left) Michael Iarocci, Dick Hseuh, K.C. Wu, George Ganetis, Steve Musolino; (back, from left) Satoshi Ozaki, Jack Sondericker, Bob Lambiase and Gary McIntyre.

Last Sunday at 2:08 p.m., while almost all other BNLers were home enjoying the sunny last day of a brisk winter weekend, Steve Peggs, Wolfram Fischer, Pat Thompson and Nick Tsoupas of the Accelerator Physics Group of the Relativistic Heavy Ion Collider (RHIC) Project were in the fluorescent-lit twilight of the Alternating Gradient Synchrotron (AGS) main control room — making Laboratory history.

One kilometer away, Mark Sardzinski, Todd Corwin, Warren Hirzel, Ed Quimby and Bill Smith of RHIC's Cryogenic System Section were in the cryogenic system control room, ensuring that history could be made by keeping things cool — real cool.

At that precise time on January 26, beams of gold ions made it all the way through the first completed sixth of RHIC, in the first integrated test of every component that will make up the entire collider. By hitting the beam stop at the end of this sextant, these gold ions proved the workings of RHIC's magnets, power supplies, vacuum system, safety system, control and monitoring system, and injection system — as well as the skill of the accelerator physicists doing the commissioning.

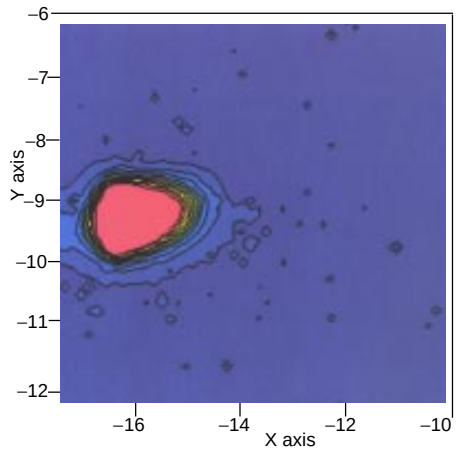
RHIC has been under construction at BNL since 1991, through funding from the U.S. Department of Energy (DOE). When commissioned in 1999 for nuclear-physics research by international collaborations of nearly one thousand scientists, RHIC will create a state of matter that last existed moments after the Big Bang. By recreating what is called a quark-gluon plasma, nuclear physicists will be able to examine an extraordinary state of matter related to the creation of the universe.

"This is a great day for BNL," says Laboratory Director Nicholas Samios, "and we take pride in the magnificent accomplishment of all the individuals who were engaged in this technical tour de force. Attaining this significant milestone on schedule demonstrates a high level of accelerator sophistication and professionalism that is to be commended. My hat is off to all who were involved. Now, on to the other five-sixths of the machine."

To make a quark-gluon plasma, RHIC will circulate two beams of heavy ions in separate pipes and opposite directions within a 3.8-kilometer-in-circumference underground tunnel at nearly the speed of light. These beams will be merged and collided at six intersection points around RHIC, thereby generating the temperature and density conditions necessary to create the hot, dense plasma of freed quarks and gluons which is thought to have last existed before the universe turned one millionth (10^{-6}) of a second old.

Golden Beacon

In this test of the first sixth of RHIC — more than 600 meters long — gold ions were sent through only the counter-clockwise beam pipe, known as the yellow ring. Looking at RHIC as if it were a clock face, beam was injected into the ring from the AGS on the right side of 6 o'clock, and it ran its course by making it to 4 o'clock, where the yellow ring will intersect with the clockwise blue ring at a collision point.



First image of the first gold-ion beam to reach the end of the first RHIC sextant, as seen on a beam-profile monitor, at 2:08 p.m., on Sunday, January 26.

At 4 o'clock, the beam was purposely halted in a temporary beam stop of concrete shielding blocks. The arrival of this long-awaited golden beacon of great things to come was heralded on a beam-profile monitor (see graphic above).

Immediately after the beam came to a halt at the end of the first sextant, RHIC Project Head Satoshi Ozaki was called to the control room from his office in Bldg. 1005. His first reactions were feelings of joy — and relief.

After having slept on the RHIC Project's success, Ozaki stated, "I congratulate each and every member of the RHIC Project for the success of this sextant test, which is the second phase of commissioning RHIC. The entire RHIC Project and many members of the AGS staff worked very hard and in unison to meet this important milestone on schedule. So, for all your extraordinary effort that resulted in this solid-gold success, I thank you and believe that you should be proud. And, may the confidence gained from meeting this challenge be used in your future work leading to the commissioning of the entire RHIC ring."

Ozaki added, "On behalf of the RHIC Project, I thank the entire Laboratory for making RHIC its centerpiece, and the Nuclear Physics Program Office in the U.S. Department of Energy, for their strong support."

"With beam reaching the end of RHIC's first sextant, the staff of the RHIC Project has shown that all systems are go for the entire collider. They also have shown that they have the necessary expertise and experience to anticipate and solve any and all problems should they arise, in an efficient and effective manner, so as to keep the project on track," comments Associate RHIC Project Head Michael Harrison, who is in charge of the collider's construction and commissioning.

Focus of the Test

Circular colliders such as RHIC rely upon electromagnets, in this case superconducting electromagnets, to guide and focus the charged-particle beams as they are accelerated to and stored at high-enough energy to perform useful experiments with. So the focus of this test is the integrated performance of RHIC's magnets, specifically the dipoles that guide the beam around each ring, the quadrupoles that focus the beam, and the sextupoles, correction magnets that make adjustments.

While the majority of those magnets were made by private industry and have all been delivered to BNL, the staff in the Lab's magnet factory in Bldg. 902 has been building RHIC's one-of-a-kind magnets, for placement after the injection point and before and after the collision points. In addition, magnet factory workers have been assembling what are called CQSs: the corrector-quadrupole-sextupole units.

Seventy CQSs, each with an 8-centimeter (cm) diameter magnet bore, were used for the sextant test, in addition to sixty 8-cm dipoles, twelve 13-cm corrector-quadrupoles, and four 10-cm dipoles. For the other five-sixths of RHIC, 350 of the 8-cm CQSs and sixty 13-cm models will additionally be required.

Between December 1, 1996, and January 31, 1997, the AGS schedule called for accelerating gold ions with energies of 11.3 billion electron volts (GeV) per each proton or neutron in a gold ion's nucleus. So, RHIC's first sextant test was originally scheduled to begin in the middle of December. For the sextant to be ready, however, all the magnets in that sixth of the ring had not only to be in place, but they also had to be interconnected — and there were 50 electrical, 20 welded and four bolted connections to make between each magnet.

The magnets immediately before and after each of the six intersection points around the ring are trios of quadrupoles known as triplets. Teamed with separating dipoles that bend the beam into and out of the intersections, the quadrupole triplets tightly focus each counter-circulating beam so as to maximize the number of ions per unit area that each brings into the collision.

A 110 Percent Effort

The final magnets — two sets of three quadrupoles — were not received by Gary McIntyre and his Installation Section until Halloween. So, with additional help from George Ganetis's Electrical Systems Group, installation and interconnection became a double-shift operation until it was completed two days after Christmas 1996.

"The effort everyone put forth was outstanding — everyone sacrificed, even during the holiday season, to

(continued on page 2)

Gold Beam Zips Through First RHIC Sextant

(continued)

give 110 percent and do a great job in a tight situation," says McIntyre.

During the installation process, a great deal of the effort was extended in making connections known as warm-to-cold transitions. These transitions take place between each straight section of beam pipe which is at room temperature, or warm, and the adjacent superconducting, or cold, magnet that bends and focuses the beam in a curved section of the collider.

As defined by its magnets and beam pipe, RHIC will have a shape somewhere between a true circle and a hexagon. Each sixth, or sextant, of the ring is defined as the magnets, beam pipe, etc. between two of the six collision points. Each sextant has a straight section of beam pipe that is not surrounded by magnets, a bent piece of beam pipe requiring dipoles to bend and quadrupoles to focus the beam, and another magnet-free straight section.

'Equivalent of Brain Surgery'

With the installation and interconnections complete, McIntyre and his group passed the baton to Dick Hseuh and the Vacuum System Section.

It was their job to create a vacuum within the beam pipe extending from the AGS through the AGS-to-RHIC (ATR) transfer line and the yellow ring to the beam stop at 4 o'clock. In addition, air had to be pumped out of the vacuum jackets surrounding the superconducting magnets, to insulate the cold magnets from the ambient temperature within the tunnel.

In all, for this single-pass-of-the-beam sextant test, Hseuh's group was responsible for providing a vacuum of 10^{-8} torr in the 600-plus meters of beam pipe. In the operating collider, with one circulating beam in each of the rings, the whole vacuum system must reach 10^{-10} torr. For the sextant test, the insulating vacuum surrounding the magnets, with a total length of over 900 meters and a total volume of over 200 cubic meters, had to be less than 10^{-5} torr.

Before the test, Hseuh and his group installed more than 1 kilometer of vacuum pipe, over 30 pumps, and over 20 gate valves to isolate the beam vacuum in sectors, should the need arise.

On December 23, as Hseuh and company began to pump down the systems, large leaks were detected in the insulating vacuum. While all the components located inside the cryostats had been tested and found to be leak-tight before installation, the ultrasonic spot welding of the aluminized mylar insulating blankets had punctured thin, flexible helium lines. Working through the holidays, Dave Pate and his crew sought to locate the leaks, which was like finding needles in a haystack.

To repair the leaks, the cryostats were opened and "the welding equivalent of brain surgery" was performed by BNL's Central Shops Division welders, said Michael Harrison. On January 15, the cryostats could be pumped down again, and the insulating vacuum was sufficient two days later.

How Low Can You Go?

With sufficient vacuum in the ring by January 17, and despite concerns about a remaining vacuum leak in the 5 o'clock triplet, the next step was to chill the superconducting magnets to their operating temperature.

To provide the high magnetic fields necessary to bend and focus heavy ions at high energy while minimizing the energy needed to create these magnetic fields, all RHIC magnets involved in those tasks within the ring are superconducting. As used in the superconducting coils of RHIC's electromagnets, a superconductor is a material in which electric currents can flow with essentially no resistance — but only when the superconductor's temperature is sufficiently low.

Low enough in the case of RHIC superconducting magnets is 4.6 kelvins (K) (–269°C). So, from Monday through Wednesday, January 20-22, while winter provided Fahrenheit temperatures outside in the teens through 40s, Michael Iarocci and his Cryogenic System Section caused temperatures to dip to a super chilly –450°F inside the sextant's cryostats.

This low temperature was achieved by employing the largest helium refrigerator in the world — RHIC's 25 kilowatt (kW) helium refrigerator.

Twice as powerful as its nearest competitor, the 25 kW helium refrigerator has been ready for this challenge since last February, when it was successfully tested over five days at 4.5 K and RHIC-equivalent heat-load conditions. A legacy of the canceled ISABELLE proton-collider project, the refrigerator dates from the 1980s, but, from 1993 to 1995, was modified to meet RHIC's specifications.

To connect the refrigerator to the RHIC sextant, Iarocci's section had to install 1,500 feet of multi-process cryogenic piping in a single vacuum jacket, valve boxes at both 4 and 6 o'clock to control the flow of liquid helium, and the cryogenic control system.

"I'm pleased how well the cryo system linked to the magnets is working as an integrated system and how quickly the combined system cooled down within only two-and-a-half days," says Iarocci.

Testing Electrical Integrity

On Tuesday and Wednesday, January 21 & 22, George Ganetis and his Electrical Systems Group checked out the power supplies and the quench-detection system. If a magnet were to quench, or cease being superconducting, the latter system would detect that fact, disconnect the quenched magnet from the power supply and extract the energy out of the sextant.

When the magnets' temperature reached 7 K on Wednesday, Ganetis and company tested the magnets' electrical integrity.

Thursday morning, January 23, after the power supplies were connected to the sextant of magnet, the power supplies were tested, as was again the quench detection system. "While we had done a lot of room-temperature simulations, this was the first time we could test the power supplies under operating conditions because this was the first time the magnets were cold," explains Ganetis.

While the maximum current that the magnets can carry is 5,500 amperes, and 5,000 amperes is the operating current, only 500 amps were required for the sextant beam test.

The power supplies' control system checked out Friday morning, so, by that afternoon, "We passed control to Steve Peggs and his accelerator physicists," reports Ganetis.

The PASS to the Test

Well before the sextant was up and humming, awaiting beam, Robert Frankel and his Collider Safety Systems Section put PASS — the personnel access safety system — into operation.

To protect RHIC personnel from radiation generated by the machine's operation and from oxygen deficiency if the liquid-helium coolant were to leak from a cryostat, Frankel and his group actually devised two, independent yet redundant safety setups. Employing the best-available new technology, these systems use different hardware and software to achieve the same goal: meeting the U.S. Department of Energy's safety standards in a timely and economic manner while operating a research accelerator.

"This is only the third time in the world that this form of safety system has been used in an accelerator research facility," explains Frankel. "Our system is based on technology usually found at oil refineries, chemical manufacturing plants, and nuclear power reactors."

Until PASS gained all approvals, beam could only go as far as the ATR transfer line, as had been done in fall 1995. For the beam to go further — down the counterclockwise Y ring toward RHIC, power supplies for the magnets that could bring it through the Y line had to be unlocked.

PASS test results were reviewed and approved by the AGS-RHIC Radiation Committee, chaired by Ken Reece, AGS, and then by the Lab's Accelerator-Readiness Review Panel, chaired by Henry Kahnhauser, Safety & Environmental Protection Division. In a document addressed to Satoshi Ozaki, the final go-ahead came at 4 p.m. on Friday, January 24, from DOE's Brookhaven Group, upon the recommendation of Sue Davis, BNL's Associate Director for Reactor, Safety & Security.

But, before the Y-line power supplies were unlocked, Frankel and his section had to link PASS to the AGS safety system, which took until 1:30 a.m. Saturday, January 25. Only then could the beam test begin.

The Last 30 Hours

Unbeknownst to the accelerator physicists in the Accelerator Physics Group led by Steve Peggs, it would take them only 30 hours to achieve what had been anticipated for years: getting beam through RHIC's first sextant.

They had a three-part job in commissioning the sextant: First, beam had to be extracted from the AGS, sent up the ATR, and through the counterclockwise Y line toward RHIC.

Second, to inject beam into RHIC, the commissioners had to thread the beam through the relatively narrow eye of the last warm magnet, a dipole called a Lambertson septum magnet. Third and finally, the gold ions had to travel to the end of the 600-meter sextant to the beam stop.

Actually, the gold ions' journey began at the accelerator where they were generated — the Tandem Van de Graaff — in five pulses. After each pulse is separately injected into and accelerated by the AGS Booster, five sets of three bunches are then transferred to the AGS, where each ion is stripped of all its electrons except the last two.

The AGS stores and accelerates these 15 separate bunches of gold ions, all whirling around the ring at near the speed of light. RHIC, however, only requires four of these bunches — but each at much higher intensity.

To achieve this, according to Thomas Roser, Head of the AGS Accelerator Division, the AGS undertakes bunch coalescence: the delicate operation of merging multiple bunches into one bunch while keeping the size of each bunch tight and, hence, increasing the intensity per pulse. Bunch coalescing has been perfected by Michael Brennan and his AGS-RHIC RF Group.

One bunch is merged with another by fine-tuning the ratio of the two AGS radio frequency (rf) systems, and it takes two steps to merge the AGS's 15 bunches into four bunches for RHIC. In fact, on Tuesday, January 28, the intensity of each gold-ion bunch was a record 4×10^{8} ions per bunch, a little less than half of the 1×10^{9} ions per bunch which will eventually be required by RHIC.

Three Goals Reached

The first goal of having gold ions knock on the door of RHIC's gatekeeper, the Lambertson magnet, was accomplished at 5:30 a.m. on Saturday, January 25, by Dejan Trbojevic, Waldo MacKay and Todd Satogata.

The second goal of injecting beam into RHIC through the Lambertson was met at 6 p.m. on Saturday, January 25, by Kevin Brown, Fritz Dell, Sanki Tanaka and Jie Wei of the Accelerator Physics Group.

This accomplishment relied particularly on the flexibility built into the RHIC accelerator control system developed by Don Barton and his Accelerator Controls Group, and the information provided by the beam profile monitors and other diagnostic equipment built into the ring by Tom Shea and his RHIC Beam Instrumentation Section.

"Because we had to hit the AGS side of the Lambertson at the right angle to fit through the tight diameter, we needed the beam diagnostics up and running," explains Steve Peggs.

In fact, beginning on January 10, while waiting to commission the sextant, the accelerator physicists had retested the ATR and proven the feasibility of a new, faster and more accurate ionization profile monitor developed by Roger Connolly of RHIC's Beam Instrumentation Section.

On to RHIC Commissioning

When the beam passed completely through the sextant at 2:08 p.m. last Sunday, the test clock did not stop: In fact, since the AGS will continue its heavy-ion run through midnight today, Friday, January 31, the commissioners have been continuing to use the beam to learn more about the magnets' workings and the beam's characteristics.

Once the beam is down, however, the sextant will remain cold through sometime in February, so each section can independently test and make measurements of its system's performance.

And, while the sextant's rf cavity was not used during this test because the beam was not accelerated with the sextant, the rf system is being powered, also to check its performance independent of the beam.

"The sextant test proved the soundness of the collider's design and our people's capabilities," concludes Ozaki. "The lessons learned from this very valuable test will be applied to the challenge remaining before us: the completion and commissioning of RHIC in its entirety in 1999."

— Marsha Belford

RHIC on BNL Calendar

The first sextant of the Relativistic Heavy Ion Collider is featured on the cover of the BNL 50th anniversary calendar, At $5 each, these fact-filled, 11"x13" calendars are still available at the BERA Sales Office in Berkner Hall; at the Public Affairs Office, Bldg. 134; and at the Upton Post Office. If you cannot come to the Lab to buy a calendar, call Public Affairs, (516) 344-2345, to find out how to order one by mail.

Two BNL Discoveries Listed Among *Discover*'s Top 100

Two discoveries made at BNL last year are on the list of "Top 100 Science Stories of 1996" featured in the January 1997 edition of *Discover* magazine.

Selected by the magazine's editors, the two BNL discoveries are: an understanding of how smoking affects brain chemistry, and the finding that a new ceramic material shrinks instead of expands when heated.

As announced in the February 22 issue of *Nature* (see the Brookhaven Bulletin of February 23, 1996), the discovery about smoking gave a possible explanation as to why smokers have about half the risk of nonsmokers of developing Parkinson's disease.

Noted on page 51 of *Discover's* year-in-science special issue, "Chemist Joanna Fowler and her colleagues at Brookhaven National Laboratory . . . found that MAO B levels in the smokers' brains were 40 percent lower than in the [brains of nonsmokers and ex-smokers]."

MAO B is short for monoamine oxidase B, an enzyme involved in breaking down a brain chemical called dopamine. The brain uses the dopamine to create and control movement, and this neurotransmitter is also associated with motivation and reward.

People with Parkinson's disease have such low levels of dopamine that their symptoms include frequent tremors, muscular rigidity and an inability to move spontaneously. And, in fact, some of the drugs used to treat the symptoms of Parkinson's work by inhibiting MAO B.

Therefore, since smokers have less MAO B, "the researchers speculate . . . [smokers] have more available dopamine and [are] less prone to Parkinson's." And, less MAO B could result in the reward and reinforcement of behavior that caused an increase in dopamine — behavior such as smoking.

This work was done at BNL's Center for Imaging and Neurosciences by Chemistry and Medical Department researchers using the Lab's Positron Emission Tomography facility. As is noted in *Discover*, what remains to be discovered is what ingredient in cigarette smoke inhibits MAO B, since it is already known from previous studies not to be nicotine.

On page 80 of the January *Discover*, zirconium tungstate is billed as the "Incredible Shrinking Ceramic" and described as a technological invention of future significance.

As was reported the April 5 issue of *Science* (see the Brookhaven Bulletin of April 5, 1996), *Discover* noted, "Arthur Sleight of Oregon State University . . . and his colleagues announced that . . . a ceramic called zirconium tungstate . . . shrinks as its temperature rises." A first of its kind in the world, this discovery was made at BNL's High Flux Beam Reactor (HFBR), using what is called powder neutron diffraction.

Solid objects usually expand when heated and shrink when cooled, as the bonds between atoms lengthen and shorten, respectively. However, as the researchers found by studying the atomic structure of the solid at the HFBR, the bonds between the oxygen atoms and the zirconium and tungsten atoms "bend like elbow joints" as the temperature rises.

To explain the compound's unique behavior, the researchers suggest that the oxygen atoms vibrate more strongly as temperature increases, pulling the zirconium and tungsten atoms to which they are bound closer by changing the angle of the bonds and, thus, causing the compound to contract.

As the first material known to shrink over a wide range of high temperatures, this ceramic is expected to be useful in electronics, where high temperatures and temperature fluctuations damage conventional components, and in dentistry, where it would be used in combination with material that expands to make a stable filling material. — Marsha Belford

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BERA Returns to Disney World

It's time to sign up for the seventh annual group trip to Walt Disney World in Florida. Sponsored by the Brookhaven Employees Recreation Association (BERA), the seven-day, six-night trip is scheduled from Thursday, October 23, through Wednesday, October 29. The trip is open to BNL employees, guests, on-site contractors, and their families.

The discounted group-package rates per person are as follows:

4 adults/rm.	$968	child age 10-17*	$584
3 adults/rm.	$1,063	child age 3-9*	$495
2 adults/rm.	$1,253	child age 2 & under	$204
1 adult/rm.	$1,923		

**Rates for ages 3-17 are applicable only when children occupy room with adult(s); maximum five per room, six with child under 3.*

Among the items included in the rates are:

- round-trip, nonstop USAir flight between Islip and Orlando;
- round-trip transportation between the airport and Walt Disney World Resort;
- six nights at Disney's Polynesian Resort;
- seven days unlimited transportation within the Walt Disney World Resort;
- unlimited admission and use of attractions at the Magic Kingdom, Epcot, Disney-MGM Studios Theme Park, Typhoon Lagoon, Blizzard Beach, Pleasure Island, River Country and Discovery Island;
- one breakfast or lunch and one dinner at a Walt Disney World dining location.

Stop in to see BERA's "Disney Family Collage" from previous years and to reserve your space, first-come, first-served, with Recreation Supervisor M. Kay Dellimore, Ext. 2873, Human Resources Division, Bldg. 185. A deposit of $140 per person is required. For more information, call Dellimore, Ext. 2873, or Andrea Dehler, Ext. 3347.

Many Cooling Tower Hands Make Light Source Work

The cooling tower on the roof of Bldg. 725 provides cooling for the National Synchrotron Light Source (NSLS). After almost 20 years of service, it was due for replacement, which took place last December. As a routine safety measure, the building was partially evacuated, and members of the Plant Engineering (PE) Division and the NSLS Department, including Bill Pinto, PE's Assistant General Supervisor of Contract Support Group, and Project Engineer Ron Beauman, NSLS, worked quickly with outside contractors to get the job done in spite of horrible weather.

"The sky produced everything you *don't* want when you're working with a rented crane that is extended 190 feet and is carrying heavy loads," commented Beauman. "It was cold and wet, with wind, and even a boom of thunder, from lightning that would have stopped proceedings completely if it hadn't been in a single flash. But everyone cooperated so well, including the people who evacuated the building, that it all ran smoothly."

Note: The Bulletin reporter was informed that the vivid memory of every-which-way precipitation and dauntless workers had inspired an onlooker to create a somewhat heroic couplet:

"Rain, snow, sleet or hail —
Our personnel never fail!"

Cool! — Liz Seubert

In Stormy Weather
Call: 344-INFO*
***Dial the letter O, *not* zero!**

50 YEARS AGO THIS WEEK

This series, which recounts the earliest days of Associated Universities, Inc. (AUI), and BNL, will run as appropriate throughout 1997, BNL's 50th anniversary year.

• **January 31, 1947** — The contract between the Atomic Energy Commission (AEC) and Columbia University is terminated. The creation of Brookhaven National Laboratory is now authorized solely under a Letter of Intent between AUI and the AEC.

Also, 38 monthly salaried employees and 16 weekly or hourly employees, formerly paid under the Columbia contract, are transferred to the AUI payroll.

• **February 1, 1947** — With the 54 people transferred to the AUI roles the day before, and an additional 18 who had been hired directly by the Laboratory during January, by the close on business on this day, the BNL staff consists of 72 people.

Effective this day, the Personnel Division sets up an Employment Section to handle the growing burden of interviewing and employment.

(To be continued on February 28.)

The entire BNL library during January 1947.

United Effort Yields $90,000

Great news came in the final report from BNL's 1997 United Way Campaign: Late-breaking contributions in January brought the total up to $90,188, surpassing the $90,000 goal.

Said BNL Campaign Chair Peter Esposito, "We are very fortunate to have the kind of caring employees that we do at the Laboratory. I'm told by the Long Island United Way that BNL had one of the highest per capita pledge contributions on the Island. I'd like to extend my congratulations and thanks again to BNL's United Way captains and representatives, and to all who gave so generously to make this a winning campaign for the thousands of Long Islanders who'll be helped in the coming year by the United Way."

Lifeguard Training

BERA will offer a lifeguard training course at the BNL swimming pool beginning Sunday, February 23, from 9 a.m. to noon.

The course is open to BERA members who are at least 16 years old, and class size will be limited. Participants must pass a swimming pretest that will be given at the first class.

Registration is taking place now at the BNL pool. For fee and other information, call Susan Dwyer, Ext. 3147 or 3496, after 4 p.m.

New Travel Hours

The new hours of operation for the Omega Leisure Travel office in Berkner Hall are 8:30 a.m. to 3 p.m., weekdays. To make personal vacation or other travel plans, call Carol Zaza, Ext. 5918.

Archery Club

The Archery Club will hold its next monthly meeting on Thursday, February 6, at noon in the large seminar room, Physics, Bldg. 510. New members are welcome. For more information, call Bill Schoenig, Ext. 2377.

Computer Training

The Computing & Communications Division will offer the following courses in March:

3/10-14 8:30 a.m.-noon, Intro. to UNIX*
3/10-14 1-4:30 p.m., PERL programming*
3/10-14 1-4:30 p.m., C++ programming*
3/17-21 8:30 a.m.-4:30 p.m., Solaris system administration**

**$300 fee **$600 fee*

Class sizes are limited, and seating will be first come, first served. To register, send an ILR for the appropriate amount to Pam Mansfield, Bldg. 515, by February 14. For more information, contact Mansfield, Ext.7286 or email pam1@bnl.gov.

Arrivals & Departures

Arrivals

Otto Ritter.....Biology
Robert J. Weggel.....Physics
Susan G. Yan.....Chemistry

Departures

This list includes all employees who have terminated from the Lab, including retirees:

Minh T. Nguyen.....Physics

DMV Forms Available on Site

Starting on Monday, February 3, BNL will have two on-site pickup points for several forms issued by the New York State Department of Motor Vehicles (DMV), as part of DMV's effort to provide Long Islanders with better service while retaining jobs locally.

In the lobby of the Human Resources Division, Bldg. 185, or at the BERA Sales Office in Berkner Hall, between 9 a.m. and 1:30 p.m. weekdays, employees may obtain DMV forms for: driver's licenses, vehicle registration, address changes, and vehicle sales tax.

Once completed, these forms and any completed renewal forms that were received in the mail may be delivered without postage to Andrea Dehler in the BERA Sales Office, for pick up by the DVM on Mondays and Thursdays.

These forms will be processed at the Long Island DMV operations center, not in Albany, so turnaround time for receiving licenses, registrations and other DMV certificates is expected to be 48 to 72 hours. Also, employees who have questions for the DMV may call a special hotline, 227-3537.

Equipment Demo

On Thursday, February 6, from 11:30 a.m. to 2 p.m., in Berkner Hall, Edge Electronics, Inc., will exhibit: SRAM, DRAM, microprocessors, fluorescent indicator panels and laser products from NEC; MCM designs, SRAM modules, flash and EEPROM from White Microelectronics; and J-PEG/M-PEG image compression, DVD, AC-3 audio and video conference equipment from ZORAN.

Cooking Exchange

On-site residents, families and friends are invited to enjoy cuisine from several different countries, at the next meeting of the Cooking Exchange — an informal gathering on Thursday, February 13, from noon to 1:30 p.m., in the Recreation Building in the apartment area. All are asked to bring a favorite dish to share. For more information, call Vicky Chang, Ext. 1064.

Send a Love Note to Your Valentine

Is there a special message you'd like to send to your valentine? Are you looking for a valentine? You can have your Valentine's Day message printed in the Brookhaven Bulletin on February 14.

Send your 15-to-20 word "love note" to the Bulletin, Bldg. 134, by Friday, February 7. Use a Sales & Notices Bulletin classified ad form, but mark it "Valentine's Day." You must sign your name and include your life number and extension, but your name will not be printed unless it is clearly part of the message. Copy must be deemed tasteful. All "love notes" will be accepted at the Bulletin's discretion. Only one message per employee please.

BERA Board Names Nominating Committee

The BERA Executive Board has named the following active BERA participants to a Nominating Committee charged with selecting a slate of four candidates to run for the 1997 BERA Board elections in March:

Name	Dept.	Bldg.	Ext.
Mary Campbell	RHIC	1005	2719
Mel Cowgill	DAT	830	2082
Kara De Castro	DAT	475B	3643
Joe De Voe	PE	452	4669
Tom Dilgen	RHIC	902A	7455
Steve Gill	AUI	134A	2496
Ed Hoey	AGS	911A	4447
Jennifer O'Connor	Reac.	750	5922
John Scheblein	RHIC	830M	2654
Beth Schwaner	HR	185	3244

Any employee who wishes to propose a nominee is encouraged to do so by contacting one of the committee members before Friday, February 21. Please be certain that the person being proposed will accept the nomination if selected by the committee.

Volleyball

Standings as of January 24

Open League		League I	
Shank, Carry & Throw	33-9	Bikers 'n Spikers	33-9
Far Side	23-16	Rude Dogs	35-10
Pass, Set & Crush	21-18	Scared Hitless	18-24
Death Volley	15-24	Net(e)scapers	13-32
Spikers	7-32	Set to Kill	9-33
League II		**League III**	
Spiked Jello	25-5	Silver Bullets	35-1
Safe Sets	24-6	Group Sets	25-11
Fossils	19-11	Upton Ups	24-12
Jao-About-That	19-11	Just 4 Fun	22-14
Monday Nite Live!	19-11	Night Court	3-3
Nuts & Bolts	9-21	New Comers	16-20
Lift, Carry, Throw	8-22	Court Hogs	12-24
Jolly Vollies	6-24	OER	7-29

Note: *Over-in-Three dropped out of League III; Night Court moved from League II to League III and started fresh on January 15.*

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position. Consideration is given to candidates in the following order: (1) present employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present employees within the Laboratory; and (3) outside applicants. In keeping with the Affirmative Action plan, selections are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Human Resources Division lists new placement notices, first, to give employees an opportunity to request consideration for themselves through Human Resources, and second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (344-7744), for a complete listing of all openings.

Current job openings can also be accessed via the BNL Home Page on the World Wide Web. Outside users should open "http://www.bnl.gov/bnl.html", then, under "Information," select "Jobs." For scientific staff openings, select "Scientific Personnel Openings"; for all other vacancies, select "General Personnel Openings."

SCIENTIFIC RECRUITMENT - Doctorate usually required. Candidates may apply directly to the department representative named.

POSTDOCTORAL RESEARCH ASSOCIATE - Trained in physics, with experience in accelerator physics. Experience in numerical analysis and computer programming is desired. Will work on space charge effects in the National Spallation Neutron Source storage ring, and lattice correction and optimization. Contact: W-T. Weng, Alternating Gradient Synchrotron Department.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

DD 6198. TECHNICAL POSITION - (term appointment) Requires an AAS degree or equivalent experience in mechanical technology. Knowledge of cryogenic technology and experience operating complex cryogenic systems for superconducting magnets are required. Duties will include operating and maintaining large cryogenic systems. Additional requirements include the ability to work rotating shifts and unscheduled overtime. Alternating Gradient Synchrotron Department.

DD 4030. DRAFTING POSITION - (term appointment) Requires AAS degree or equivalent with pertinent AutoCAD Release 12 for Windows drafting experience. Will perform nonroutine drafting assignments in support of Plant Facility Operations. Will update, modify and maintain AutoCAD drawings and related databases in support of Fire Alarm Testing, Preventive Maintenance, Facility Inspection, and Space Management Programs. Additional responsibilities include utility systems instruction updates. Familiarity with Microsoft Access 2.0 and Foxpro 2.6 database application also required. Plant Engineering Division.

DD 3851. ENGINEERING POSITION - Requires MS in electronic engineering. Will design and test electronic circuits and systems for detectors and associated measurement systems in research programs at RHIC, HFBR, NSLS and other BNL activities. Demonstrated thorough training and strong foundation in electronics fundamentals and current technologies, tools test and measurement techniques, and the ability to solve instrumentation problems encountered in sophisticated scientific research programs are essential. Instrumentation Division.