BROOKHAVEN BULLETIN
Vol. 46 - No. 3 January 17, 1992
BROOKHAVEN NATIONAL LABORATORY

Radeka Accepts Another Term as Head of Instrumentation

In April 1972, Veljko Radeka became Head the Instrumentation Division for a term of three years. Now, 20 years and four term renewals later, Radeka has agreed to continue as Instrumentation Division Head for another five years, until December 31, 1996.

"Veljko's excellent leadership of the Instrumentation Division has led to significant contributions to many different areas of the Laboratory's research program and to the scientific community at large," said BNL Director Nicholas Samios. "We have been fortunate to have him in this position, and I am happy that we will continue to benefit from his vigorous leadership."

Located in the south wing of Bldg. 535, Instrumentation's staff numbers 55. As Radeka explained, "Our motivation has been to develop new instrumentation and techniques for use in scientific research, and our program has always been based on the scientific direction of the whole Lab."

Roger Stoutenburgh

Veljko Radeka

"In meeting these goals," said Radeka, "whatever degree of success we have achieved is primarily due to three ingredients: a very good staff with solid scientists and professionals, support from management, and close collaborations with scientists from other departments and institutions.

"I guess one of our principal achievements is that we have responded to the increasing needs of the BNL research program, while having about the same number of people in the division over a period of 20 years," Radeka continued, "and during this time, Instrumentation has grown in scope and diversity of programs and output."

Instrumentation's staff includes about 20 scientists and engineers whose expertise covers a number of diverse areas: gas and liquid detectors, silicon detectors (see accompanying story), low-noise electronics, processing of signals from detectors, monolithic circuits, laser applications, optics metrology, electro-optical devices, microstructures, vacuum deposition technology, experiment control and data acquisition.

"Our staff members have long-standing collaborations with scientists from other departments and institutions, and, together, they generate ideas," said Radeka. "We have been most active in developing new instrumentation and technology for high energy and nuclear physics, advanced accelerator development, solid-state physics and structural biology, in particular for neutron and x-ray scattering, and for experiments with synchrotron radiation."

The high-resolution, position-sensitive detectors for thermal neutrons that Instrumentation has recently developed, largely with Senior Biophysicist Benno Schoenborn of the Biology Department, "have contributed to making BNL's High Flux Beam Reactor the foremost neutron scattering facility in the world," said Radeka.

"We have also developed x-ray position-sensitive scattering detectors for x-ray scattering at the National Synchrotron Light Source," he added, "which are considered to be the best in the world, in terms of position accuracy and ability to operate at high photon rates."

(continued on page 2)

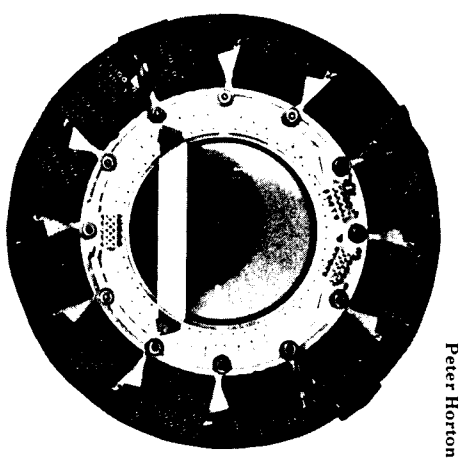
Silicon Detectors 'Drift' Out of Instrumentation Division

Unbeknownst to the general public, the properties of silicon that have supported so much breakthrough computer technology also form the foundation of many advances in the field of scientific instrumentation.

And at BNL for the past few years, Instrumentation Division scientists have used these properties to make a variety of custom-built silicon junction detectors.

"Silicon has particularly good chemistry for making devices," explained Hobie Kraner, who, with Rolf Beuttenmuller and Zheng Li, forms Instrumentation's silicon detector group. "A clean, tenacious oxide can be grown on silicon crystals to form a coating that we can inscribe microphotographically. The oxide gives an impervious edge to the smallest features engraved on it. This allows the technology of microcircuits to be applied to silicon junction detectors."

Detectors provide information on the positions of particles emerging from collisions in particle physics experiments. Silicon's properties allow structures in the detectors to be built at the micron size — "about one twenty-fifth the width of a human hair," said Kraner. "So the detectors, each about several square centimeters, are small enough to be placed very close to the collision region without crowding other parts of the apparatus, while providing excellent position resolution."


Peter Horton

The Brookhaven-made silicon drift chamber invented by Pavel Rehak, BNL, and Emilio Gatti, Milan. In the center is a three-inch-in-diameter silicon wafer.

Roger Stoutenburgh

Working on a drift detector in the Instrumentation Division laboratory are (from left) Wei Chen, Pavel Rehak, Donald Pinelli and Rolf Beuttenmuller.

Instrumentation's silicon junction detectors — the term "junction" referring to the boundary, or junction, between two types of silicon in the wafers required to produce the electric field in the device — are state-of-the-art instruments. They are tailored individually to experiments in high energy particle and relativistic heavy ion physics research and other specialized applications.

The Silicon Drift Detector

The most complicated silicon device produced by the silicon detector group, which also includes Wei Chen of the Physics Department, is a silicon drift chamber.

Invented by Pavel Rehak of the Physics Department and Emilio Gatti, annual visiting senior scientist in Instrumentation from the Polytechnical University of Milan, this detector provides very high spatial resolution for measuring the position of particles.

"Eight years ago, when we first thought of this detector, it was a departure from tradition," said Rehak. "It uses a new geometric arrangement of electrodes that allows the electric charges caused by particles to be collected laterally."

To make the detector, an electrode structure is built on both sides of a silicon wafer, establishing a uniform electric field with a collecting anode at the center or on the edge of the detector area. When a particle penetrates the wafer, the electric field pulls the electric charges produced by the particle to the collecting anode at a constant velocity. The time taken for the charge to "drift" to the center from the instant of impact shows the particle's position when it hit the wafer.

"The result is very precise," commented Rehak. "Also, this configuration of electrodes gives very low background electrical noise, so the detector is sensitive to extremely small signals."

Rehak met Gatti when they collaborated during one of Gatti's visits to BNL, which started in the 1970s. "We discovered that recent interests of each of us could perhaps be combined into a new detector," recalled Rehak. "What we were aiming for was simple, but technologically difficult."

Gatti and Rehak worked on their ideas before Gatti's next arrival at the Lab, and then started discussing them. "For three days, we talked. And we came out with the answer!" said Rehak. "We each had quite complicated ideas, but, as we went back and forth, we found the device could be much simpler than either of our previous designs. In the eight years since then, changes have been just improvements — the essentials were completed in those three days."

A circular device based on the invention is now taking data in the NA45 experiment at CERN, the European particle physics research laboratory. This device was built in the Instrumentation Division by Chen and Li, working with Rehak and Donald Pinelli, also from Physics, with outside support from the Physics Department and the Max Planck Institute in Munich. Testing and some experimental work and planning were contributed by the University of Heidelberg.

Tech Transfer Planned

In addition, not only does the device have a bright future as an x-ray detector at the National Synchrotron Light Source, but also several applications of it are planned for BNL's Relativistic Heavy Ion Collider (RHIC), now under construction.

In one of these applications, 300 of Rehak and Gatti's devices will track particles' positions at the very heart of the giant planned detector known as STAR, which stands for the Solenoidal Tracker at RHIC.

A number of prototype devices for this experiment will be made at BNL, but the relatively large number of detectors needed will present an opportunity to transfer this technology to the semiconductor detector industry. — Liz Seubert

Coming Up

Emily Sachar, *Newsday* reporter and author of the book *Shut Up and Let the Lady Teach,* will be the guest speaker at a Brookhaven Women in Science (BWIS) Seminar on Wednesday, January 29, at 5:15 p.m., in Berkner Hall, Room B. Her topic will be "Teaching Math in the Inner City: Thoughts of a First-Year Teacher."

On the Calendar — Three Months Out of 12

William Marin

Of each year's crop of stunning calendars, one of the most outstanding remains the Carl Zeiss, Inc., calendar of photomicrography — featuring magnified images of microscopic objects photographed by "eminent North American photomicrographers." And among them, with his photographs selected for March, September and December of 1992, is BNL's William Marin Jr., of the Photography Department of the Photography & Graphic Arts Division.

A well-known manufacturer of photomicrographic equipment, Zeiss prints its calendar in highly restricted numbers for clients in the U.S. and Canada.

Marin joined the Lab in 1974 after getting a B.S. from the Rochester Institute of Technology. As the Lab's photomicrographer, he found he enjoyed being able to "communicate scientific knowledge in aesthetically pleasing ways."

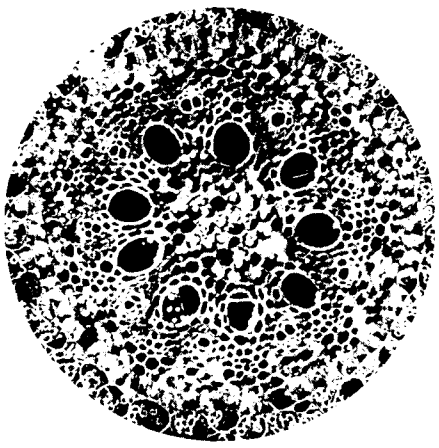
Within two years, one of Marin's images was chosen for the cover of *Science* magazine. Since then, his photographs of Lab research have covered or appeared in *Science, National Geographic, Time-Life Books* — and many specialized journals such as *American Laboratory* and *Neurotoxicology*. He and his work were also the subject of an August 1988 article in *American Photography*.

Most recently, *Kodak Tech bits* chose Marin's image of a raw silicon crystal to illustrate photography's future in a lead December 1991 article on the evolution of imaging technology. "I was very pleased," said Marin. "Many photographers see this journal, so I feel complimented." At the Lab, Marin's work can be seen in the Microscape Gallery of the Exhibit Center/Science Museum, Bldg. 701.

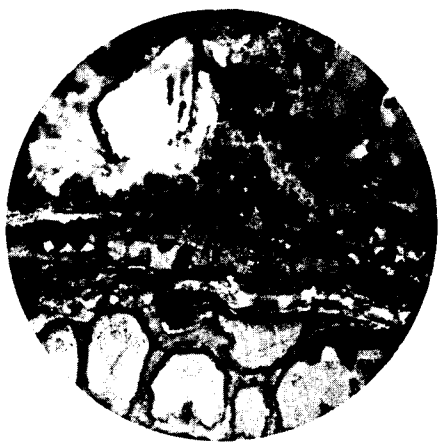
Marin won several of Nikon's International Small World photographic competitions and, in 1986, was a judge of the competition — the same year that Zeiss, Inc., first selected him to illustrate three months of their calendar. He also appeared on national TV as an expert on photomicrography. "That was a lucky year for me," recalled Marin. "Maybe this year will be the same!"

Marin's expertise in contrasting tone and shade at the same time as color allows his color photographs to be reproduced in black and white without losing too much of their impact.

But, in the original calendar, you enter the brilliance of the Land of Oz, not the monochrome of Kansas, staring through these open windows onto imaginative, beautiful and scientifically accurate visions of the microscopic world. — Liz Seubert



March: A root of monocotyledon, a subclass of seed plants, magnified 40 times.



September: An ancient cast bronze artifact from Thailand, magnified 400 times.

December: Aluminum electrode rings of a drift-type particle detector, magnified 16.5 times.

Going Metric

If the numbers used in today's story on "The Temperature's Rising" give you pause, then you still haven't "gone metric." But the Brookhaven Bulletin has. As this story so vividly illustrates, we have adopted metric units as the primary system of measurement, with the English conversion in parentheses.

Radeka (cont'd)

Other significant contributions by Instrumentation have been in the areas of silicon detectors for particle physics experiments, gas detectors for relativistic heavy-ion experiments and optics metrology for characterization of optical elements for synchrotron radiation.

"In addition," said Radeka, "we see a very active future in the development of detectors for BNL's Relativistic Heavy Ion Collider and for the Superconducting Super Collider. We also see an increasing role for laser applications, optics and electro-optics."

Looking back at the technology, Radeka mused, "All these devices have become much more complex. Some of the devices of 20 years ago would look very primitive today. While the basic principles have not changed, the technology has advanced a great deal, allowing one to implement much more complex detectors and instruments."

Helping advance the technology has been Radeka's own research, which has centered on scientific instrumentation, radiation detectors, noise and signal processing in physical measurements, position-sensitive detectors, fast electronics and nonlinear circuits. He has published about 115 papers in these areas. Several of these, dealing with processing of signals from detectors, have been reprinted in books as classic contributions.

Signal processing for a huge underground detector was one of the first challenges that Radeka faced after joining the BNL staff in 1966.

For the renowned Brookhaven solar neutrino experiment, Radeka and Lee Rogers, also of Instrumentation, developed a very sensitive method of signal processing that resulted in appreciably reduced background noise, which was critical for that experiment. Led by Raymond Davis, now retired from the Chemistry Department, the South Dakota-based experiment ran from 1967 to 1985, to find that the number of energetic neutrinos coming from the sun was far lower than predicted by theories.

Radeka has also contributed to the advance of x-ray and neutron position-sensitive detectors, electronically cooled terminations, logarithmic charge amplifiers and liquid-argon chambers.

Starting in 1973, Senior Physicist William Willis, Director's Office, and Radeka broke new ground by using liquid argon in a new type of calorimeter, a device for measuring the total energy of particles generated in collisions in particle physics experiments. This technique became widely used, and, after further developments, is expected to be a principal calorimetry method for future colliding proton-beam accelerators.

Most recently, Radeka has had a leading role in research and development of detectors and signal processing for future accelerators.

With a 1955 Diploma Engineer degree in electrical engineering and a 1961 Doctorate of Engineering Sciences, both from the University of Zagreb, Radeka came to BNL as a visiting scientist from 1962-64. He joined the Lab staff as an associate engineer in 1966. Named engineer in 1969, Radeka received tenure in 1970. He was named Head of the Instrumentation Division in 1972 and Senior Engineer in 1973.

Radeka received the 1983 Merit Award of the Nuclear and Plasma Sciences Society of the Institute of Electrical and Electronics Engineers (IEEE). A Fellow of IEEE, he is also a recipient of the IEEE Centennial Medal. Radeka is a member of the American Physical Society.

The Temperature's Rising at Brookhaven

Air conditioners ran overtime at BNL in 1991, another record-breaking year for hot weather.

The average annual temperature for 1991 was 11.7°C (52.9°F) — 0.2 degrees higher than the record set in 1990. Since 1949, when meteorological records started being kept at the Lab, the average yearly temperature has been 9.8°C (49.7°F).

According to weather records compiled by BNL meteorologist Bob Brown of the Department of Applied Sciences' Oceanographic and Atmospheric Sciences Division, 19 new daily temperature highs were set and two ties for highest daily temperature were made in 1991.

Only one daily low temperature broke a record last year: On September 2, the low record set was 5°C (41°F), breaking the previous record set in 1958 by just a fraction of a degree.

Last year's spring was hotter than ever, with April and May setting records for the warmest months. In April, the average temperature was 10.5°C (51°F), breaking the previous monthly record set in 1985 by 0.5°C (1°F). A heat wave in April set record daily temperatures three days in a row. The thermometer hit 22.5°C (72.5°F) on April 6, 27.2°C (81°F) on April 7, and 30°C (86°F) on April 8.

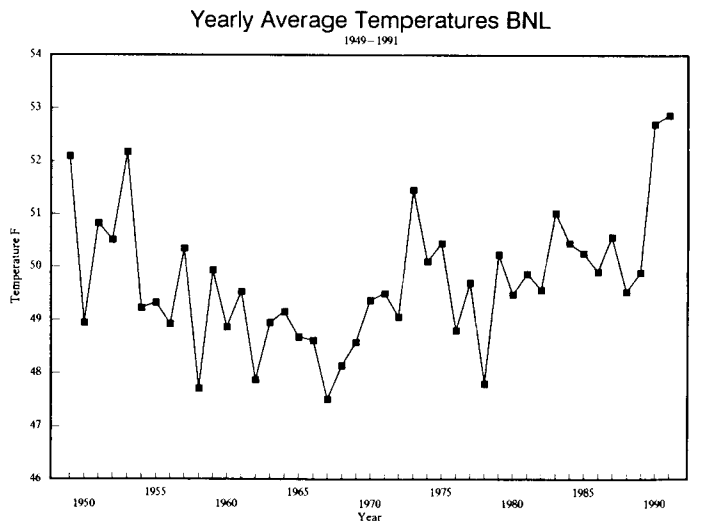
May's average temperature was 16.8°C (62.4°F) — 1.5°C (2.7°F) more than the previous record for the month set in 1975. Four record daily high temperatures were recorded in May: 29.7°C (85.5°F) on May 12, 28.9°C (84°F) on May 14, 30.8°C (87.5°F) on May 22 and 32.8°C (91°F) on May 25 — 3.4°C (6°F) more than the record set a decade ago.

The most dramatic record breakers occurred in February and July. On February 5, the high temperature was 20.8°C (69.5°F), which broke the previous record set for the day in 1960 by a whopping 8.6°C (15.5°F). July 21 was a scorcher with a high temperature of 38°C (100.5°F). That broke a 1980 daily temperature record of 35.8°C (96.5°F), and tied with a record set on July 22, 1957, for the highest temperature ever recorded at BNL.

Precipitation was slightly less than normal in 1991. The total yearly precipitation was 114.63 centimeters (45.13 inches), while the norm is 123.24 centimeters (48.52 inches). August was the wettest month with 23.34 centimeters (9.19 inches) of rain.

Cooling and heating degree days are calculated to show the relative amount of energy needed for cooling and heating over the year. Based on the number of degrees that were above 18.3°C (65°F), cooling degree days totaled 802, the highest number ever recorded at BNL. Heating degree days for the year, based on the number of degrees that were below 18.3°C (65°F), were 5,198, well below the average of 6,117. The record low for heating degree days was 5,147, which was set in 1990.

— Diane Greenberg



In this graph showing the annual fluctuations in temperature over the 43 years that weather patterns have been recorded at BNL, a definite warming trend is evident starting in 1979.

Volunteers Needed For Imaging Studies

Male volunteers, ages 20 to 60 and in good health, are needed to participate in brain and heart imaging studies being conducted by BNL. A fee will be paid. For more information, call Naomi Pappas, Ext. 2694.

Camp Upton Memories on Loan To Museums at Stony Brook

Cartoon drawings from the Camp Upton Historical Collection in BNL's Exhibit Center/Science Museum are among the items that have been loaned to the Museums at Stony Brook for two exhibitions celebrating the achievement of women in the military.

Called "Quietly Bold: Frontline Women" and "For God, Country and the Thrill of It: Portraits of Women Airforce Pilots," the exhibits will be on view from Sunday, January 19, to Sunday, February 23, in the Art Museum located at 1208 Route 25A, Stony Brook.

Organized specifically for the Museums at Stony Brook, the "Quietly Bold: Frontline Women" exhibit will focus on women in the military, both in and out of action, from World War II through the Persian Gulf War.

The cartoon drawings that BNL has loaned for this display were done by Clarice Fortgang Pollard, a WAC who was stationed at Camp Upton 1944-45. Pollard's cartoons were used for recruitment posters, and her account of her pioneering service has been recorded in a recently published work, *Laugh, Cry Remember — the Journal of a GI Lady.*

WAC Clarice Fortgang Pollard

The second exhibit is a traveling display featuring 45 black and white photographs of the World War II women airforce pilots known as the WASPS.

Camp Upton, in General

Long before BNL opened its doors in 1947, the Lab site was the home of the U.S. Army's Camp Upton. The army acquired the then Yaphank site in 1917, immediately after the U.S. entered World War I. Thousands of men trained at Camp Upton during 1917 and 1918, then went overseas.

After Armistice Day in November 1918, the camp became a debarkation center for men returning from overseas. Then, the government ordered Camp Upton leveled and held a public auction to sell off virtually everything on site.

Over the next 20 years, nature reclaimed the site, though part of the area was cleared by the Civilian Conservation Corps.

In the summer of 1940, with the war in Europe escalating, the Army decided to reactivate Camp Upton. The camp became one of the main reception centers for thousands of inductees from New York City and Long Island. As the need for new troops lessened and wounded soldiers were shipped home, the camp expanded into a convalescent hospital.

When the war ended in 1945, Camp Upton was closed once more — leaving available the perfect site for a national laboratory in the Northeast. Since 1947, when the U.S. Postal Service established the Upton Post Office, the site has been located in Upton.

But where did the name Upton come from?

Camp Upton and the town of Upton are both named after General Emory Upton, a Union general during the Civil War and, later, commandant of West Point.

Born in 1839, Upton was an 1861 graduate of West Point. He then saw distinguished service with the Union's Army of the Potomac and in the Tennessee, Alabama, Georgia campaign.

Brigadier General Emory Upton

Upton became brigadier general in 1864, and then was brevetted major general. He was the author of *A New System of Infantry Tactics, Double and Single Rank, Adapted to American Topography and Approved Firearms,* published and adopted by the U.S. Army in 1867. He died in 1881.

Recently, Peter Soo and James Guppy of the Department of Nuclear Energy (DNE), "rediscovered" the accompanying portrait of General Upton. For many years, it had been hung in various DNE conference rooms and, most recently, was gathering dust on a bookshelf in Bldg. 475.

They decided that a more appropriate place for the picture would be the Camp Upton Collection in BNL's Exhibit Center/Science Museum, so the framed photo has been turned over to Janet Tempel, who heads the museum.

David Diamond and Arnold Aronson, also of DNE, tracked the history of the photo to a 1963 negative on file in the Photography & Graphic Arts Division. However, it is not known if the original painting exists on site.

Can anyone shed any light on this question?

Reports Available

The following reports are available to Laboratory staff and affiliates of DOE, AUI and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Staff members should call the designated contact.

NUREG/CR-5611
BNL-NUREG-52251
Contact: D. Storan, Ext. 2716
Issues and Approaches for Using Equipment Reliability Alert Levels. Prepared by: E. V. Lofgren and S. H. Gregory

NUREG/CR-4659
BNL-NUREG-52007
Contact: B. Apuzzo, Ext. 2746
Seismic Fragility of Nuclear Power Plant Components (Phase II) Vol.4., K.K. Bandyopadhyay, C.H. Hofmayer, M.K. Kassir and S. Shteyngart

NUREG/CR-5707
BNL-NUREG-52286
Contact: K. Roman, Ext. 3643
Application of Containment and Release Management to a PWR Ice-Condenser Plant. P. Neogy and J. Lehner

BNL-52293
Contact: P. Durcan, Ext. 3807
Polyethylene Encapsulation of Nitrate Salt Wastes: Waste Form Stability, Process Scale-Up, and Economic. P.D. Kalb, J. H. Heiser III and P. Colombo

NUREG/CR-5771
BNL-NUREG-52294
Contact: K. Ryan, Ext. 5312
Probability and Consequences of Misloading Fuel in a PWR. D.J. Diamond, C.J. Hsu and V. Mubayi

Arrivals & Departures

Arrivals

Karen L. Lucadano.....App. Science
Louis Naglieri.....Accel. Dev.

Departures

None

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BNL Choir to Debut At Gospel Extravaganza

Roger Stoutenburgh

The BNL Gospel Choir will be one of four local community choirs that will perform at the 11th annual Gospel Extravaganza. This event will usher in the Afro-American Culture Club's celebration of Black History Month, on Saturday, February 1, at 7 p.m., in Berkner Hall.

Formed last December, the nondenominational BNL Gospel Choir is a multicultural and multi-professional group of Brookhaven employees who have come together for the single purpose of singing gospel songs.

Their debut performance will take place at the Gospel Extravaganza, so plan to be there to share their talents and the inspiration of their songs.

Shown here at a recent lunchtime rehearsal at the Brookhaven Center are BNL Gospel Choir members: (front, from left) Aramentis Booker, Tina Hale, Barbara Kponou, Joyce Robinson, Angela Johnson, Jean Sells, Karen Green, John Bloom, Ron Manning, Michelle Cummings, Arthur Anderson III; (back, from left) April Donegain, Fran Ligon, Vanessa Crump, William Sells, Greg Bagley, and Arthur Anderson Jr. At the piano is Ojettia Bright, who directs the choir with Fran Ligon.

Tickets to the Gospel Extravaganza cost $12 for adults and $5 for children. They are available from Robert Brown, Ext. 3569, Bldg. 490; April Donegain, Ext. 2459, Bldg. 134A; Fran Ligon, Ext. 3709, Bldg. 185A; and Bruce Penn, Ext. 7213, Bldg. 197C. No tickets will be sold at the door.

P.M. Car Switches To Ronkonkoma

Effective Monday, January 27, the courtesy car that takes passengers to the Long Island Rail Road every afternoon will change destinations. Rather than go to Mastic/Shirley, the car will deliver passengers to the Ronkonkoma railroad station.

Every working weekday, the car will depart from the Transportation Office, Bldg. 179B at 4 p.m. to meet the train that will leave from the Ronkonkoma station at 4:46 p.m., arriving in Pennsylvania Station in New York City at 6:08 p.m.

Equipment Demo

LakeShore Cryotronics will demonstrate their latest temperature-control and magnetic instrumentation products on Wednesday, January 22, from 10 a.m. to 3 p.m., in the Berkner Hall lobby. A LakeShore representative will be on hand.

On display will be the new four-quadrant magnet power supply for superconducting and electromagnets, the new series of magnetometers combining ac susceptibility and dc magnetization measurements in fields of up to five teslas, and the new series of autotuning temperature controllers.

A Tasty Sight

No, BNL is not opening up a new adjunct to the Cafeteria. BNL's Sandwich Shop already exists — in Cambridge, Maryland. That's where Charles Bachsmith, who retired from the Department of Applied Science in 1989, and his wife Carolyn were traveling last October when they spied this sign and snapped the photo.

Holiday Notes

The Laboratory will be closed on Monday, January 20, due to the Martin Luther King Jr. holiday. The following schedules will be in effect:

Food Services

The Cafeteria will operate only snack bar service from 9 a.m. to 2 p.m. on Monday, January 20. The Brookhaven Center Club will be closed on Sunday, January 19, and will open January 20, from 5 p.m. to 9 p.m.

Credit Union

The Teachers Federal Credit Union will be closed Monday, January 20, but the automated teller machine in the foyer of Berkner Hall will be open.

Volleyball

Standings as of January 9

Open League		League I	
Magnum	22-2	Upfagrabs	23-7
G-Team	15-9	Network News	20-10
Phoenix	12-12	Dinkers	19-11
Me and the Boys	11-13	Rude Dogs	20-13
Penetrating Vollies	7-17	Six Pack Attack	15-15
Leftovers	5-19	Setups	10-23
		Bumps & Sets	1-29

League II		League III	
Monday Night Live	20-1	Renegades	19-5
Net Wits	18-6	Nutcrackers	17-7
Fossils	12-9	High Volley'em	16-8
Nuts & Bolts	11-10	Over the Top	15-9
Just Ups	11-10	Good Timers	14-10
Night Court	10-11	Sourcerers	9-15
Volley of the Dolls	6-15	Interns	9-15
Upton Ups	6-15	Silver Bullets	5-19
Muffits	2-19	Undertakers	4-20

Bowling

Red/Green League

R. Eggert had a 266/213/627 scratch series, K. Riker 237, K. Asselta 236/616 scratch, R. Wiseman 226/209/614 scratch, E. Meier 224, A. Sauerwald 224, D. Larsen 217/207, K. Koebel 211, J. Muller 208, R. Mulderig 208, T. Prach 205, H. Arnesen 203, D. Jesaitis 201.

White League

Joe Mayeski had a 237, Ed Sperry IV 228/600 scratch series, Dick Adams 224, Sharon Smith 209, Boyzie Singh 209, Tom Romano 207, John McCarthy 206, Nancy Mayeski 185, Lorraine Petro 181.

Purple League

Debbie Keating had a 201, Kurt Jellett 200, Pat Manzella 194, Maryann Reynolds 181, Nancy Erickson converted the 6/7 split.

Hospitality News

The next meeting of the Women's Forum, conducted by Marion Davis-Parzen, will be Tuesday, January 21, at 10 a.m., in the Brookhaven Center.

The Group meets every third Tuesday of the month to discuss women's issues and to share experiences and concerns. Wives of Lab employees and guests are welcome. Come and bring the children.

In Stormy Weather:
Dial 282-INFO

Tennis Party

The Tennis Committee will sponsor a night of tennis on Saturday, February 8, at the Miller Place Tennis Club, 9222 Route 25A, Miller Place.

Six courts have been reserved for BNL employees, family members and friends, beginning at 8 p.m. and ending at 11 p.m. The price of $22 per person includes three hours of tennis, plus food and beverages.

Since the number is limited, please sign up in the BERA Sales Office as soon as possible. For more information, contact Steve Shapiro, Ext. 3822.

Reserve now!

Valentine's Day Special Dinner $15.95

At the Brookhaven Center Club

Friday, February 14, 5 to 7 p.m.
Menu: Seafood bisque, tossed salad, broiled swordfish steak or prime rib of beef, chocolate mousse or fresh strawberries w/whipped topping.
For reservations, call Ext. 3539.

Cafeteria Menu

Luncheons

Monday, January 20
Martin Luther King Jr. Day
Snack bar service - 9 a.m. to 2 p.m.

Tuesday, January 21

Soup: Beef & rice	.80/1.10
Entree: Seafood Newburg over toast	3.45
Entree: Veal cordon bleu w/1 veg.	3.65
Entree: Chef's choice	3.20
Carvery: Hot roast beef sandwich	2.95
Grill: Grilled Reuben	2.85

Wednesday, January 22 - Winter Special
Free cup of hot chocolate w/each entree

Soup: Home-style vegetable	.80/1.10
Entree: Beef vegetable stew	3.20
Entree: Baked ziti	3.20
Entree: Fish Italiano w/1 veg.	3.45
Grill: Grilled Monte Cristo	2.95
Deli: Submarine sandwich	2.95

Thursday, January 23

Soup: Corn chowder	.80/1.10
Entree: Shepherd's pie	3.20
Entree: Sweet & sour pork over rice	3.45
Entree: Chef's choice	3.20
Carvery: Hot corned beef sandwich	2.95
Grill: Philly cheese steak	2.95

Friday, January 24

Soup: Tomato rice	.80/1.10
Entree: Stuffed shells w/1 veg.	3.20
Entree: Braised beef tips w/1 veg.	3.45
Entree: Chef's choice	3.20
Carvery: Hot turkey sandwich	2.95
Grill: Fried chicken breast fillet	2.95

Catch a glimpse of
GLANCE
playing in Berkner Hall
weekdays, 11:30 a.m. to 1:30 p.m.
Show changes every Tuesday.

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 Personnel Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Personnel, 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 (282-7744), for a complete listing of all openings.

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

POSTDOCTORAL RESEARCH ASSOCIATE - Position available for a recent Ph.D. in organic chemistry to work on the synthesis of novel metal chelating agents and the development of conjugation chemistry for radiolabeling monoclonal antibodies. Contact: Ronnie Mease, Medical Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

MK 8371. DEPARTMENT ADMINISTRATIVE MANAGER - Requires a BS/MS in a relevant discipline or equivalent, substantial experience with high-level administrative policies and procedures in an engineering/research environment. Will be responsible for the full range of functions including budgets, proposals, personnel, procurement, program support, technical assistance, facilities/property management, MIS and systems development. Will have supervisory responsibility for administrative staff. Will carry out existing departmental policies, and develop and implement departmental policies. Must have excellent analytical skills and effective oral and written communication. Must be able to deal effectively with all levels of Laboratory staff and those of customer agencies, and demonstrate a high degree of initiative and professional judgement. Submit resume to Marsha Kipperman, Personnel Division, Bldg. 185. Department of Nuclear Energy.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

NS 1014. TECHNICAL POSITION - Requires AAS in engineering science or equivalent and substantial experience in construction, assembly and testing of rf and microwave equipment. Must be skilled in the operation of rf test equipment and have knowledge of ultrahigh vacuum procedures and electronic manufacturing methods. Experience with general electronics and high-power equipment for accelerator applications strongly desired. (Reposting) RHIC Project, Accelerator Development Department.

DD 0141. ELECTRICIAN A - Under minimum supervision lays out, constructs, installs, maintains, repairs and operates electrical systems, equipment, controls and related devices. Plant Engineering Division.

DD 8717. OFFICE SERVICES POSITION - (temporary) Requires previous travel office experience, specifically, several years' SABRE computer experience. Will assist BNL staff in all aspects of travel such as airline, railroad, bus and ferry reservations, limousine or car rentals, and accommodations. Staff Services Division.

Motor Vehicles & Supplies

90 CHEVROLET 1500 SERIES PICKUP - 8' bed, V-8, p/s, p/b, ac, am/fm cass., 18k mi., $12,000. 472-3332.

89 GMC JIMMY - V-6, a/t, fully loaded, $10,850. 696-6011, leave message.

89 TOYOTA 4x2 PICKUP - 4-spd., low mi., am/fm radio, bedliner, $5,300. Ext. 4605.

89 CAVALIER Z-24 - p/w, ac, p/l, a/t, am/fm cass., tilt, cruise, sunroof, needs tires, $6,900. Bill, Ext. 2377 or 821-6523.

89 JEEP CHEROKEE - red, 45k mi., 4-dr., 4wd, 6-cyl., a/t, tilt, cruise, am/fm cass., ac. Vera, Ext. 7702.

88 FORD TEMPO - all wheel drive, loaded, w/options, v.g. cond., $4,800. Ext. 4095 or 475-8504.

88 NISSAN MAXIMA SE - sport pkg., 5-spd., white, p/w, p/seat, p/l, ac, cruise, sunroof, tilt, am/fm cass., orig. owner, $8,700. Chris, 286-1348.

87 BUICK LE SABRE - 4-dr., maroon, ac, p/l, am/fm, new tranny, brakes, just tuned, new tires, 65k mi., clean, $4,150. Dan, Ext. 7271.

87 NISSAN PULSAR - ac, T-top, am/fm tape, black, new tires, exhaust system, warranty transfer till Aug., $4,500 neg. 474-3080.

87 FIREBIRD - 61k mi., red, excel. cond. in & out, $4,500. Pat, Ext. 4406.

86 TOYOTA CAMRY - ac, am/fm, cruise, 5-spd., p/s, p/b, excel. cond, $4,775. Ext. 7788 or 369-5091.

86 PONTIAC SUNBIRD - turbo, h/b, 83k mi., ac, am/fm cass., excel. cond, ask. $2,500. Andrea, Ext. 3090.

86 CHEVY SPRINT - 3-cyl., 50+ mpg, front end damage, $475. Joe, Ext. 2898 or pager 0925.

84 MALLARD MOTOR HOME - c/c, 2 ac, self-contained, 31k mi., sleeps 8; '81 Susuki RM 60, excel. cond., $300. 878-1178.

83 TRANS AM - 350 cid, V-8, 5-spd. s/t, ac, p/b, p/s, burgundy, garaged. John, 588-0910.

83 HONDA ACCORD - 4-dr., 5-spd., am/fm cass., ac, p/s, p/b, cruise, high mi., dealer maint., excel. running cond., $1,250. Ext. 2109 or 472-9199.

81 OLDS CUTLASS SUPREME - new tires, good cond., $1,400. Harvey Richardson, Ext. 4953.

81 FORD BRONCO - parting out, no motor, a/t, reasonable. Rich, Ext. 3354.

80 CHEVY MALIBU - 4-dr., p/s, p/b, a/t, V-8, 100k mi., very clean, $1,000. Dieter, Ext. 2704.

80 CHEVY VAN - V-6, new exhaust, best offer. Bob, Ext. 4672 or 929-4753 eves.

79 HONDA CIVIC CVCC - h/b, good basic transportation, $650 neg. Paul, Ext. 7577.

78 MALIBU - 2-dr., high mi., blue, ac, great stereo, runs well, reliable, must sell, $750. Roy, Ext. 7357.

76 AMC HORNET - needs starter, $200. Kathy, 744-2203.

76 CHEVY SUBURBAN - 6-cyl., a/t, p/b, p/s, new battery & tires, runs well, $500. Frank, Ext. 7519, or Vita, 277-0464.

62 JEEP CJ5 - many extra parts incl., new soft top, must sell, make offer. Mark, 744-3383 or 821-7172.

RIMS - assorted sizes for many Chevy, Ford, & Chrysler cars & trucks, good for snow tires, $10 ea. Frank, Ext. 7519.

TIRES - 5, 3.75x16.5 mounted on 8-lug rims, 2 snows, 3 reg. tread, excel. cond., all for $135. Ext. 4719.

TIRES - E-14 snows. H-14 snows, 4 ea. 185-14 radials, 4 ea. 215-15 radials. Ken, Ext. 4514 or 289-8212 eves.

TIRES - Mickey Thomson Baja belted 33x14.50 Lt., full ¼" tread, 3 perfect, 1 has cut, $100 w/wheels. Joe, Ext. 7365.

TIRES - 4, 155-80x13 on Dodge Omni rims, good cond., $15 ea. Ext. 4597 or 924-8213.

CHEVY BIG BLOCK - 454, disassembled, new oversized cam, rings, bearings, gaskets, oil pump, motor cleaned & honed, $1,300. Ed, 661-9155.

Furnishings & Appliances

COUCH & LOVESEAT - Colonial, wingback chair, good cond., $300. Bonnie, Ext. 2875.

DINING ROOM SET - antique; upright freezer, reasonable. 363-7032.

TABLE - antique; bedroom set, antique, best offer, must sell, no dealers. 698-0654.

BEDROOM SET - 5-piece, large mirror, $200. Ralph, Ext. 4446.

COFFEE TABLE - oval glass top, $65; hutch, pine, custom-made, 6½' high x 5½' wide, 6 doors, 9 drawers, 3 shelves, $195. 475-4199.

HEADBOARD - brass, Dresher, king-size, like new, $300. Will, 878-6639.

MICROWAVE - over stove, $100. John, Ext. 2667 or 821-2652.

SOFA BED - rattan, $100. Kathy, 744-2203.

WASHER - Whirlpool, v.g. cond., $150. Paul, Ext. 7577.

Tools, House & Garden

FIREWOOD - oak, split. J. Scesny, 732-2849.

WOOD STOVE - Hearth Mate, HM 2400, rated for coal or wood, 10 yr. old, 20"x26"x34", good cond., heats whole house, $115. Greg, Ext. 3263.

Sports, Hobbies & Pets

BICYCLE - 16", for young child, $25. John, Ext. 2667 or 821-2652.

BICYCLES - man's 10-spd., $20; folding bicycle, portable, adult, 20" wheels, $20. Victor, Ext. 2395.

BOWLING BALL - man's, $10; radio, $10; toaster/broiler oven, $20; bucket seat cover, $5. Kathy, 744-2203.

DARK ROOM - 3 8"x10" dev. trays $2/ea.; tank, $5; 2 safelights, $6/ea.; photo enlarger, 35mm Leitz Valoy II, $60. Ext. 4341 or 475-4005.

FISH TANKS - 10 gallon, complete set-up, $50; African Cichlids, wholesale. Roy, Ext. 7357.

SKIS - 170 cm, Head Radial w/Marker bindings, $99. 473-2473.

SKI BIBS - woman's size 12, navy blue, $20. Ext. 5873.

SOLOFLEX - complete. Oscar, Ext. 3499.

SURFBOARD - Ocean Avenue, Tim Briers series, 5.9", channeled bottom, used twice, $220 neg. Ralph, Ext. 4446.

TELESCOPE - Meade, 1,000mm, Schmidt-type w/camera adapter. Bill, 286-7583.

Audio, Video & Computers

CAMCORDER - Sharp VHS 8-1 zoom, battery pack & charger, a/c adapter, case, tripod, like new, $350. Nancy, Ext. 7996.

COMPUTER - 2 Commodore 64s, power supply, color monitor, floppy, joysticks, extras, $250 neg. Pat, Ext. 2836.

VCR - Canon VR-HF 720, hg, hi-fi, TV sound, 107-channel, cable-ready, 8 pro./1 mo. timer, 1 yr. warr., asking $300. Al, Ext. 3992 or 331-1003 eves.

STEREO - Centrex 8-track, recording, am/fm compact system, Pioneer, excel. cond., $30. Pete, Ext. 4581.

TRANSCEIVER - TS930, mint, MFJ949D ant. tuner, AMECO PT3, preamp, Aurtek QF-1A, audio filter, all like new. Don, Ext. 2622.

TYPEWRITER - Royal Academy, electric, portable, good cond, $35. 473-7667.

Miscellaneous

ARMY FOOTLOCKER - 1942, $20; old metal musical doll crib, $20; 3-piece luggage, Samsonite, woman's, $35; gas stove, gold, $50. 878-6637.

BABY'S ITEMS - Cosmos stroller, playpen, walker, good cond., $60/all. Devinder, Ext. 4985.

DESIGNER FRAGRANCES - perfume for women & cologne for men, 3.3 oz., $25/ea. Lou Pergola, Ext. 3499 or 732-1028.

JACKET - black rabbit, new, size M, $75; white coat, size 6, worn once, cost $250, now $100. 475-8658.

MACRAME HANGERS - w/8" or 10" pot, many styles, colors & lengths, $13. Laurel, Ext. 4095.

OPERA TICKETS - 2, Metropolitan, Wagner's *The Flying Dutchman*, Wed., Jan. 29, 8 p.m., first row balcony, $29/ea. Carmen, Ext. 4135.

PAINTING - orig. oil, initialed F.L., dated 1959, framed, 22"x28", vase of white & gold flowers, $75. Joyce or Paul, 289-5770.

YARNS - knitting, crotcheting, all colors. Christine, 281-6233.

Free

REFRIGERATOR - G.E., old, working, good cond. Ralph, Ext. 4446

Wanted

BABY'S ITEMS - carriage, swing, car seat, etc. Ernesto, Ext. 3869 or 874-9089.

CADILLAC - 85-87, Fleetwood 4-dr., Brougham D'Elegance, good cond., low miles. John, Ext. 3292 or 286-1348.

COAL - nut or larger, free or cheap, will pick up. Carl, Ext. 4986.

C64s - for parts, working or not okay. Dan, Ext. 2622.

DOGHOUSE - good condition. Ext. 4985.

GUITAR CASE - and instructional books for beginners. Jim, Ext. 2393.

HOUSEMATE - share house, 1-2 bdrm. avail., cable/HBO, phone, w/w, fenced yard, 10 min. to Lab, reasonable, util. incl. Sue, 399-3087.

ROWBOAT - any kind that floats, 10' long, cheap. John, Ext., 7671.

SKIERS - to ski Hunter Mt., 2/5, $45, send payment to Augie Hoffman, Bldg. 510C, next trip 2/19 to Belleayre.

TRAINS - Lionel & America Flyer, priv. collector, pays top $. Bruce, 924-4097.

In Appreciation

To all the friends and colleagues of Theo Sluyters who expresssed their sympathy in many kind ways upon his untimely death — we warmly thank you. — Erika Sluyters & family

Classified Ad deadline is 4:30 p.m. Friday for publication Friday of the next week.