

## Omega-Minus Garnerers APS Award for Discoverers

For their 1964 discovery of the omega-minus particle, which validated the quark model of elementary particles, Laboratory Director Nicholas Samios; Senior Physicist Ralph Shutt of the Magnet Division of the RHC Project; and Senior Physicist Robert Palmer, who heads the Lab's Center for Accelerator Physics (CAP) have been chosen by the American Physical Society (APS) to share in the 1993 W.K.H. Panofsky Prize.

The three will share equally in the \$5,000 prize, which will be awarded on April 13 in Washington, D.C., during APS's annual meeting.

Sponsored by friends of the first director of the Stanford Linear Accelerator Center, Wolfgang K.H. Panofsky, and the APS Division of Particles and Fields, the prize was established to recognize and encourage outstanding achievements in experimental particle physics.

"The winning trio has had a long and distinguished research record, which includes a number of notable physics firsts at Brookhaven," commented Val Fitch, Chairman of the Board of Trustees of Associated Universities, Inc. "Ralph Shutt started in the early 50s with the observation of associated production of strange particles; Nick Samios and Ralph Shutt then teamed and were joined by Bob Palmer in the 60s to discover omega-minus; and, in the 70s, Samios and Palmer followed up with the first sighting of a charmed baryon. Theirs is an enviable record of discoveries, so it is a real pleasure for me and the AUI Board to see them recognized with this prize."



Roger Stoutenburgh

With a photo of the production of the famed omega-minus particle in the background, the particle's discoverers review the original film of the first observation of the event that has earned them this year's Panofsky Prize from the American Physical Society: (from left) Ralph Shutt, Nicholas Samios and Robert Palmer.

The citation for the prize to be awarded to Samios, Shutt and Palmer reads:

For their leadership in the discovery of the omega-minus baryon, the convincing piece of evidence for the correctness of the application of unitary symmetry to the spectroscopy of strongly interacting particles. The observation of the omega-minus, at the predicted mass of 1675 MeV and with the predicted stability

against strong decay, was a dramatic verification of the SU(3) ideas and of the quark model. It is, therefore, a fundamental component of the "standard model."

### Elusive Particle Search

On December 14, 1963, a 34-member BNL/Rochester/Syracuse collaboration led by Nicholas Samios, which included Samios' then officemate Robert Palmer as a chief contributor,

began the first experiment at BNL's Alternating Gradient Synchrotron to use what was then the world's biggest hydrogen bubble chamber — BNL's new 80-inch bubble chamber, which had been designed by Ralph Shutt and his collaborators in the then Bubble Chamber Group.

By scanning the photographs of the bubbles created by charged particles as they passed through superheated liquid hydrogen within the chamber, the collaborators studied the interactions of a beam of five-billion-electron-volt K-minus mesons with the protons making up the hydrogen nuclei.

By the end of their AGS run in January 1964, the experimenters had taken some 133,000 photographs. After less than two weeks of analyzing these photos, they discovered a new particle with a mass of 1675 million electron volts (MeV) that was composed of three strange quarks — the elusive omega-minus. They announced their discovery in *Physical Review Letters* that February 24.

What is called the unitary symmetry law SU(3) classifies strongly interacting particles called hadrons into groups called multiplets, based on similarities shared by the hadrons, which are made up of truly elementary particles called quarks.

Accordingly, a semistable particle with a negative charge made up of three strange quarks with a mass around 1680 MeV was needed as the tenth member of the multiplet called the baryon decuplet, which contains ten of the 27 possible particles con-

(continued on page 2)

## Davis Named Associate Director for Reactor, Safety & Security

M. Sue Davis was appointed Associate Director for Reactor, Safety and Security, effective December 1. She had served as Acting Associate Director since May 1. Her appointment followed a nationwide search in which 93 candidates applied or were nominated.

In her new position, Davis oversees the management of the Safety & Environmental Protection Division, which provides technical support to the Lab in matters of environment, safety and health; the Reactor Division, which runs the High Flux Beam Reactor and the Brookhaven Medical

Research Reactor; the Safeguards and Security Division, which provides security for Lab personnel and materials; and the Office of Environmental Restoration, which has primary responsibility for environmental remedial activities on site. Further, as a member of the BNL's Directorate, Davis will take part in all major planning decisions for the Laboratory.

"Sue brings to this position extensive knowledge and experience which will ensure the Laboratory's commitment to operate in a safe and environmentally responsible manner," said BNL Director Nicholas Samios. "Her background as a scientist gives her a sensitivity to the Laboratory's mission to maintain and expand the excellence of its scientific programs."

As Associate Director, Davis interfaces with the U.S. Department of Energy (DOE) on all matters related to reactor safety and security, as well as environment, safety and health (ES&H) issues, with particular focus on special DOE initiatives, such as the Tiger Team Progress Assessment. Davis is responsible to the Director for assuring that DOE and Laboratory requirements in ES&H are planned and implemented.

Davis said the job presents several challenges: "We must forge a strong partnership between the overall research mission of the Lab and the need to assure a safe and environmentally sound workplace. We also have to assure a proper balance between the many requirements that we must meet and maintain our status as a world-class research organization. It is my goal to achieve and foster this balance."

"I am pleased to accept this position," Davis added, "and will work



Roger Stoutenburgh

M. Sue Davis

to support the research mission of the Laboratory and its goal to maintain a safe and environmentally sound workplace."

Davis joined BNL's staff in 1974 as a research associate in the Chemical Sciences Division of the Department of Applied Science, where she explored various aspects of photosynthesis. A year later, she earned her Ph.D. in physical chemistry from the University of Rochester.

In 1981, Davis moved to the Department of Nuclear Energy, where she studied technical problems related to radioactive waste management and later became Deputy Head of the Nuclear Waste Management Division.

In 1985, Davis was appointed Special Assistant to the Associate Director for Applied Programs at the Laboratory, and in 1990, she was named Assistant to the Laboratory Director.

## Reaver Appointed S&SD Manager

Effective January 1, Russel Reaver was appointed Manager of the Safeguards & Security Division (S&SD), replacing Larry Runge, who has left Brookhaven to head S&SD at Los Alamos National Laboratory.

"Russel Reaver has the expertise and experience to assume the important responsibilities of his new position," said M. Sue Davis, Associate Director for Reactor, Safety and Security.

She added, "I would like to express the gratitude of all of us at BNL to Larry Runge for a job well done, and to wish him well in his new endeavor."

As Manager of S&SD, Reaver is in charge of personnel, computer and information security at BNL, as well as the safeguarding of on-site nuclear materials and government property.

Soon after he received his B.S. from the University of Missouri, Reaver joined the U.S. Air Force where he remained a commissioned officer until 1988, serving in several capacities, including pilot and intelligence officer, and gaining extensive experience in security-related matters, including the management of security organizations.

While he served in the U.S. Air Force, Reaver also earned his M.A.



Roger Stoutenburgh

Russel Reaver

from Webster University. A year after he retired, he joined BNL as Manager of the Police Group. Reaver was named as S&SD's Acting Manager last November 13.

Regarding his new position, Reaver said, "I am pleased that the Laboratory has selected me to lead this successfully tested, professional organization, and I expect the Division will continue to fulfill its mission of providing a safe and secure environment for research under U.S. Department of Energy directives."

## Omega-Minus (cont'd)

taining the three quarks called down, up and strange.

In fitting the bill, the discovery of omega-minus not only confirmed SU(3) theory, but also laid the foundation for the development of the gauge theory of interactions among quarks — quantum chromodynamics.

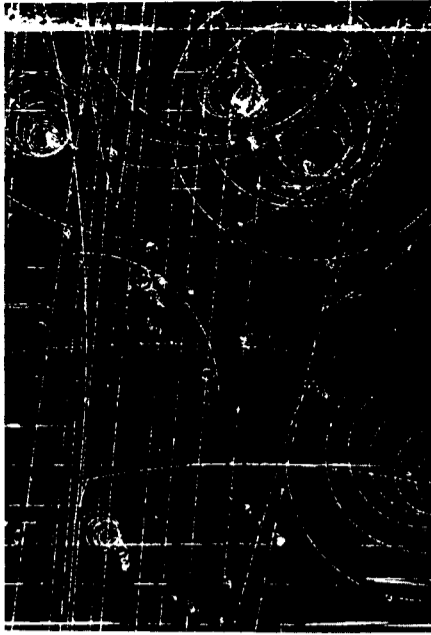
### The Winning Trio

Nicholas Samios received both his A.B. and his Ph.D. in physics from Columbia University, in 1953 and 1957 respectively. After instructing in Columbia's Department of Physics, 1956-59, he joined the staff of BNL's Physics Department. After the omega-minus discovery, Samios led first what has become Physics' Omega Group, 1965-75, and then the department itself, 1975-81. It was in 1975 as well that he headed the collaboration that discovered the first charmed baryon.

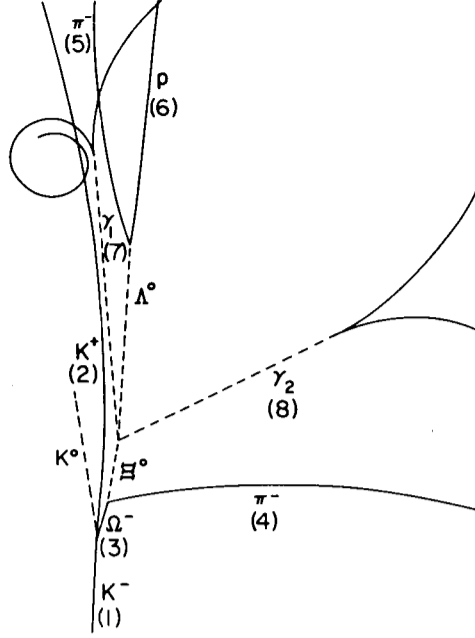
The U.S. Department of Energy awarded Samios an E.O. Lawrence Memorial Award in 1980, for his outstanding contributions in the atomic energy field. That same year, the New York Academy of Sciences bestowed him with their Physical and Mathematical Sciences Award. In 1981, Samios was named BNL's Deputy Director. After four months as Acting Director, Samios assumed the directorship in May 1982.

Nicholas Samios is a member of the National Academy of Sciences, and a fellow of the American Academy of Arts & Sciences and the APS.

Ralph Shutt received his D.Sc. in physics in 1938 from the Technical University of Berlin. He came to the U.S. in 1939, joining the Bartol



The photo on the left is the first ever taken of the omega-minus ( $\Omega^-$ ) particle. The sketch on the right shows which events in the picture point to the  $\Omega^-$ . At the bottom of the drawing, an incoming  $K^-$  meson is shown interacting with a proton in the liquid hydrogen of the 80-inch bubble chamber. This produces an  $\Omega^-$ , a  $K^0$  and a  $K^+$  meson. The  $\Omega^-$  is subsequently shown decaying into a cascade of other particles. Neutral particles, which produce no tracks in the chamber, are shown by the dashed lines and are identified by their decay products.



Research Foundation of the Franklin Institute in Pennsylvania to conduct cosmic radiation research using cloud chambers and electronic counters. During World War II, his research concerned acoustics and ultrasonics. After the war, 1946-47, Shutt returned to cloud chamber work on cosmic radiation, but at the Aberdeen Proving Ground, Maryland.

Shutt came to BNL in 1947, to lead the design, building and use of, first, cloud chambers, then of bubble

chambers in high-energy nuclear physics, first at the Cosmotron and then at the AGS. Before the discovery of omega-minus, in 1953, Shutt and colleagues were the first to verify the paired production of so-called strange particles and, therefore, the existence of strangeness, which was later shown to be an attribute of any particle containing a strange quark.

Shutt was named Deputy Chairman of the then Accelerator Department in 1971. In 1973, he moved to

the Physics Department, where he was Deputy Department Chairman, 1974-75. Shutt later served as the Head of the Magnet Division of the Accelerator Development Department, 1983-84. At present, he and his colleagues are doing analytical work on superconducting magnets for BNL's Relativistic Heavy Ion Collider (RHIC) and the national Superconducting Super Collider (SSC). Ralph Shutt is a fellow of the APS.

Robert Palmer did both his undergraduate and graduate work at the Imperial College in London. After taking his Ph.D. in physics in 1960, he came to BNL's Physics Department, to join the Bubble Chamber Group, led by Ralph Shutt. Following the omega-minus discovery, Palmer played a part in the discovery of neutral currents, at CERN in the early 1970s; the first charmed baryon, at Brookhaven in 1975; and, again at CERN, direct single photons, in 1978.

Palmer's interest in accelerator physics led him to invent the inverse free electron laser in 1972, and, in 1980, the grating laser accelerator. From 1980 to 1983, Palmer and coworkers developed magnets for the Colliding Beam Accelerator (CBA) Project, and then for the SSC. The success of many of today's superconducting accelerator magnets can be traced to the Palmer magnet designed for CBA.

Palmer served as BNL's Associate Director for High Energy Physics Research, 1983-86, and, following a one-year sabbatical from the Lab, was named CAP Head upon his return in 1987. He resumed this appointment in 1991, after a one-year leave of absence at the SSC. Robert Palmer is an APS member.

## In Memoriam

**Maria C. De Natale**, a Senior Office Services Assistant in the Safeguards & Security Division (S&SD), passed away on December 7. She had been at BNL for 18 years.



After joining the Plant Engineering Division in 1974 as an office services assistant, De Natale moved to the Technical Information Division in 1977, gain-

ing her final promotion two years later. She transferred to her last division in 1988, where she worked until May 1992, when illness forced her to take leave of absence on long-term disability.

As Assistant Security Specialist Patricia Cahill emphasized in a vivid tribute to "our friend Maria" on behalf of all S&SD, "Each one of us will have our own special memory left behind... the way she cared... her honesty... the way she would always be rushing around... always taking time to say hello... Maybe Maria's passing will cause us to be a little more grateful today, a little more caring, a little more compassionate.

She would like that."

Maria De Natale was a member of the Upton Chapter of Professional Secretaries International, holding the position of Recording Secretary. A resident of Shirley, she is survived by her two sons, Frank Jr and John.

**Virginia H. Brown**, who was Manager of Compensation and Projects in the Personnel Division, as well as BNL's Women's Program Coordinator, died on December 21, following a courageous struggle against cancer. She was 56 years old.



"Virginia had an indefatigable desire to develop and implement human resources policies that would reinforce an 'aura of excellence' at the Laboratory," said Personnel Manager Robert D'Angio. "Even during the course of her illness, Virginia was concerned, interested and involved in making BNL a better place for all employees."

In 1987, BNL Director Nicholas Samios selected Brown to chair the Lab's Task Force on Recruitment and Retention. In 1989, this group submitted recommendations to the U.S. Department of Energy that led to the modification of the Lab's relocation assistance policies.

Another proposal was approved as BNL's Recognition Awards Program. Now in its third year, this program consists of four different kinds of performance-related awards.

Samios then appointed Brown Women's Program Coordinator in October 1990. In that capacity, she was part of BNL's Employee Relations Program — another person to whom employees could bring their work-related problems.

As Manager of Compensation and Projects, Brown was overseeing the beginning of the Lab's new human-resources systems. Dubbed the 3P Project because it integrates payroll, personnel and personnel forecasting,

this system will come on line in the second quarter of 1993.

Brown's 36-year association with BNL began in 1956, with a summer job in Personnel. She returned in 1959, as a personnel assistant, leaving in 1961 when her son was born. Rejoining Brookhaven in 1977 at her former title, she became Personnel Representative in 1979, Salary and Wage Administrator in 1980, and Manager of Salary and Wage in 1983. She was promoted to her final position in 1987.

An adjunct instructor at Suffolk Community College and at the State University of New York at Stony Brook, where she had earned an M.S. in Russian History in 1968, Brown had been certified as a compensation professional by the American Compensation Association. She was a past president of the Long Island Electronic Wage and Salary Group.

Virginia Brown is survived by her husband Hugh Brown, a senior physicist in the Alternating Gradient Synchrotron Department; a son, Alexander, of Boston; and a daughter, Elise, of Maine.

A memorial service for Virginia Brown will be held Saturday, January 16, at 1 p.m., at the Old South Haven Presbyterian Church, South Country Road, Brookhaven.

Donations may be made to the Virginia Brown Scholarship Fund of the Brookhaven Village Association, Box 167, Brookhaven, NY 11719, or the National Breast Cancer Coalition, P.O. Box 66373, Washington, D.C. 20035.

## BNL Spent \$40 Million On Long Island in 1992

BNL poured \$40 million into the local economy in fiscal year 1992 by purchasing supplies and services from Long Island businesses. These local purchases added up to almost one-third of all goods and services the Lab purchased between October 1, 1991, and September 30, 1992.

Of the 12,600 purchases that the Lab made in 1992 on Long Island, 8,805 were made in Suffolk County, and 3,795 were made in Nassau County. In dollars, \$23 million was spent in Suffolk, while \$19.7 million of that amount was purchases from small businesses. In Nassau, BNL spent \$17 million — \$5.7 million on small-business purchases.

Mary-Faith Healey, Manager of the Division of Contracts & Procurement, said, "Long Island has a large number of high-tech firms as well as a highly skilled labor force. We make use of that local market whenever we can. We also try to do business with small companies and small, minority-owned companies whenever possible."

Most of the funds were spent on high-tech goods and construction. For example, the Lab paid Grumman Aerospace Corporation of Bethpage — BNL's number-one vendor — approximately \$9.5 million for high-tech goods, which included superconducting magnets for the Relativistic Heavy Ion Collider.

Other top vendors to the Lab included:

- Gordon L. Seaman, Inc., a Bohemia-based construction firm, which signed a contract with BNL to build a computerized network that will eventually monitor the heating, ventilation and air-conditioning in 100 buildings on site, at a cost of \$1.4 million.
- Murray Miller Construction of Great Neck, which will receive \$1.2 million for renovations and asbestos removal.
- Silicon Graphic Computer of Melville, which contracted with BNL to provide various computer equipment and services for \$1 million.

In addition, 56.6 percent of BNL's operating budget of almost \$282 million for fiscal year 1992 was spent on salaries and wages, while 17.6 percent went toward fringe benefits. Most of these funds were also poured back into the economy by BNL employees themselves.

## Savings Bonds At Credit Union

If you're a member of the Teacher's Federal Credit Union (TFCU), you can now buy U.S. Savings Bonds at the TFCU on-site Upton Branch. These bonds are *not* available through payroll deduction; they must be ordered and paid for through TFCU and will be mailed to the owner within 15 days. For further information, contact Lisa Goodenough, Branch Manager, Ext. 2790.



## VIPs Feted for Years of Service

There were <sup>240</sup> Very Important Persons (VIPs) invited to the 1992 Service Award Reception, held in the Brookhaven Center the evening of Tuesday, December 15. These VIPs included six employees who marked 40 years of Laboratory service during the past calendar year, 27 who had observed 35th anniversaries, 88 who had completed 30 years at the Lab, and 49 for whom 1992 was their 25th anniversary year at BNL. Other VIPs included the 51 Brookhaven employees who have between 36 and 39 years of service, and the 19 who have been with the Lab over 40 years. Other guests included spouses of VIPs, and department and division heads.

— Photos by Roger Stoutenburgh



## Service Awards

The following employees celebrated BNL service anniversaries during December 1992:

### Forty Years

Paul Levy.....Applied Science

### Thirty-Five Years

Tage G. Carlsson.....Plant Eng.  
Leonard Newman.....Applied Science  
George M. Penny.....Reactor

### Thirty Years

William C. Crockett.....Biology  
James L. Davis.....Saf. & Env. Prot.  
J. Dennis Klein.....NLSL  
William G. Sieger.....AGS  
Bernard L. Stepnoski.....AGS  
John A. Wilcenski.....RHIC

### Twenty-Five Years

Ronald W. Weider.....AGS  
Joseph R. Yelk.....Physics

### Twenty Years

I. Hung Chiang.....AGS  
Thomas F. Koetzle.....Chemistry

### Ten Years

Peter D. Johnson.....Physics  
Lu Ann Lewis.....Staff Services

## Addled Address

- Uptoneburg, NY 11973

## Aerobic Dance

There's still time to sign up for the current classes offered by the Aerobic Dance Club. Stretch classes, are held on Mondays at the Physics lounge, Bldg. 510, and aerobic dance classes are held Tuesdays and Thursdays, at the Recreation Building in the apartment area.

Classes run from 5:15 to 6:15 p.m.; mats are recommended for both. Each session of aerobic dance or stretch costs \$30, payable at registration preceding the first class.

For information, call Pat Flood, Ext. 4853, a.m., or Ext. 5070, p.m.; or Janet Sillas, Ext. 2345.

## Second Bus To Miss Saigon

If you had wanted to take the BERA-sponsored bus trip to Broadway to see *Miss Saigon*, but it was full — here's a second chance. BERA has arranged for a second trip one week later, on Saturday, April 24.

Other than the date, everything is the same as for the first trip: The cost of \$119 per person includes round-trip bus transportation; a brief stop and tour at the South Street Seaport; an orchestra seat to the matinee performance of *Miss Saigon*; a full-course dinner at The Cafe 44 Restaurant in the theater district, with choices of steak, seafood, pasta and more; and all taxes and tips.

Reservations are now being taken at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. A \$50 deposit to reserve theater tickets is due immediately, with the balance due by Friday, March 19. For more information, call Carolann Zebrowski, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

## Software Demo

Ansoft Corporation will demonstrate new design tools available for electromagnetic layout and semiconductor design, in the CCD Seminar room, Bldg. 515, on Thursday, January 14.

Presentations will begin at 9 a.m. sharp with Maxwell Spicelink, a product for electronic design-automation applications.

At 1:30 p.m., the Maxwell Field Simulator, a dedicated simulation tool for electromechanical, high-voltage and magnetic applications, will be presented. This product offers 2D, axisymmetric, and 3D modeling for electrical and magnetic field applications.

Register with Ted Daniels, Ext. 5555 or td@bnl.gov.

## PSI Meeting

Bobbie Hayes, fashion and image consultant from Color Couture, will be the guest speaker at the next meeting of the Upton Chapter of Professional Secretaries International (PSI), on Tuesday, January 12, at 6 p.m., in the Recreation Building.

After discussing fashion, image and finding your most harmonious look, she will do color analyses for several guests.

Heros, coffee, and dessert will be served at \$3.50 for members and \$4.50 for nonmembers. RSVP to Susan Carlsen, Ext. 7647, or send a check to her in Bldg. 701 by January 11.

## Story Postponed

Due to lack of space, the story about Brookhaven's 1992 Distinguished Research & Development Awards has been postponed but should run next week.

## Computing Course

A SunOS system-administration course has been scheduled for two sections over two weeks, from January 25 to February 5. Each section will take 10 half days, with the morning course starting promptly at 8:30 a.m. and ending at noon, and the afternoon course beginning at 1 p.m. sharp and ending at 4:30 p.m.

Class size will be limited to 18 people, and each seat may be reserved with an ILR for \$500. Send Email to wittlock@bnl.gov or call Ext. 4112 for information or to register.

## BNL Food Drive

Donors — if you have tapes, prepare to shed them now!



Finast and King Kullen supermarkets, which have been giving cash refunds for receipts collected on behalf of such efforts as the BNL Food Drive, are suspending their programs — Finast on January 31, King Kullen on March 31. So, if you have been hoarding a tape collection, please send it immediately to BNL Food Drive Chair Carole Kerr, Bldg. 460, who will continue to redeem the receipts until those dates.

Special thanks go to all the BNLers who donated 3,660 lbs of food in December to needy families in the Town of Brookhaven. Remember — people are just as hungry in January.

 January pickup next week.

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ANITA COHEN, Editor  
MARSHA BELFORD, Assistant Editor  
LIZ SEUBERT, Reporter

35 Brookhaven Ave., Upton, N.Y. 11973  
(516) 282-2345

