BROOKHAVEN BULLETIN

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August 8, 1975

Weneser Returns To Research Samios Becomes Physics Head

On the first of September, Nicholas Samios will succeed Joseph Weneser as Chairman of the Physics Department for a term of five years. Weneser will return to full time research.

Samios is best known for heading the experiment that led to the discovery of the Omega Minus particle in 1964. The discovery was extremely significant because the Omega Minus met the description of a

Nicholas Samios

particle theorized by Murray Gell-Mann and Yuval Ne'eman to be the "missing link" in an orderly arrangement of previously known particles.

During his career as a high energy particle physicist, Samios' activities have led to the discovery of a host of other particles besides the Omega Minus, including the phi, eta′ and f′ bosons and several cascade resonances. With the aid of the 20-inch and 80-inch bubble chambers these endeavors also uncovered the properties and decay modes of many particles.

Since 1970, Samios has headed the New Group in the Physics Department. The New Group, said Samios, is dedicated to the discovery of new particles and studying the interaction between particles. The group is presently using the 7-foot bubble chamber to explore neutrino physics. The members of the group are searching for single charmed particles, unlike the J-particle discovered last fall, which is believed to be composed of two charms, one being an anti-charm.

Last spring, an unusual event was seen which could be the first example of a charmed hadron. It was one of a hundred neutrino events seen during the analysis of 62,000 bubble chamber pictures. The results were published in the April issue of *Physical Review Letters*. Since this finding, a number of other laboratories around the world have reported seeing charmed particles.

Although Samios will be giving up the group's leadership when he becomes Chairman, he plans to keep actively involved in the research. "By keeping involved in physics, you retain your ability to judge," he said.

During the last year, Samios has spent much of his time on activities related to the ISABELLE project. He has been in charge of a group in the Physics Department which has examined the physics justification of the proposed accelerator. At the same time, he has been a member of the ISABELLE Steering Committee along with Associate Director Ronald Rau, Accelerator Department Chairman Mark Barton, Ralph Shutt of the Physics Department and Harald Hahn, Accelerator. In the spring, Samios was one of three persons from the Laboratory who went to Woods Hole to defend ISABELLE before a subpanel of the High Energy Physics Advisory Panel, chaired by Professor Francis Low of MIT.

Samios joined the Physics Department at BNL in 1959 as an assistant physicist. He was appointed associate physicist in 1962, physicist in 1964 and senior physicist in 1968. In 1965 he became head of the Nuclear Interaction Group until 1970 when he headed the New Group.

Prior to coming to Brookhaven, Samios was an instructor in physics at Columbia University. He received his BA and Ph.D. degrees in physics from Columbia. While at Columbia he was involved with the construction and use of propane and hydrogen bubble chambers. He was part of a group which used these bubble chambers to investigate the strong, weak and electromagnetic interaction of elementary particles.

Samios is a fellow of the American Phys-

(Continued on Page 2)

A Night On The Town Coming To Brookhaven

A Very Special Event for Brookhaven employees and their friends will signal the end of summer this year. Broadway will come to BNL in the form of Dinner Theatre the last two weekends in September.

Each of the four big nights will start off with pre-dinner cocktails, a choice of entree for a full course dinner, a Broadway Theatre production followed by dancing 'til the wee small hours to one of four different bands.

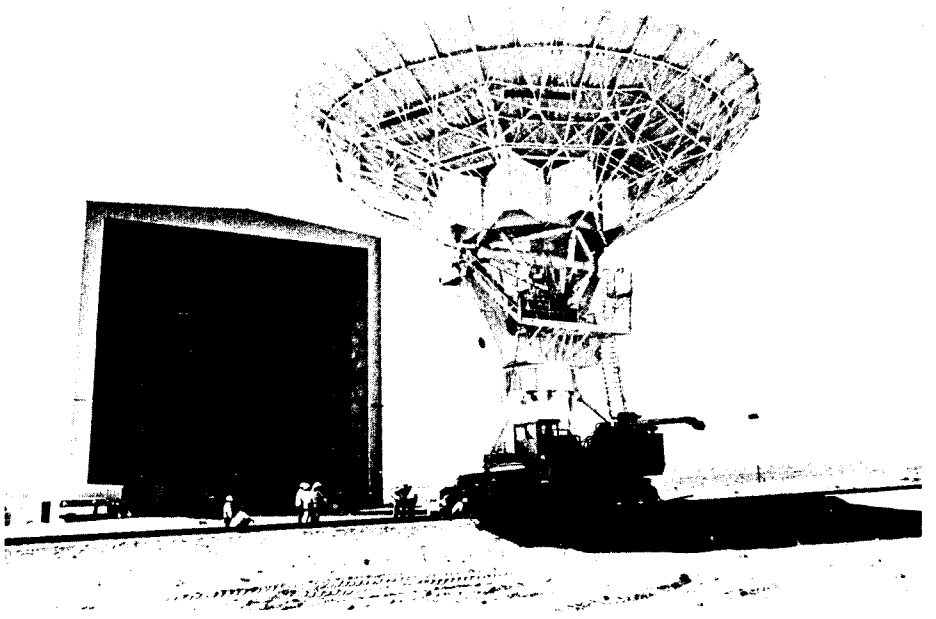
In addition, there will be free parking in Brookhaven's protected parking area at the Center, after-dinner drinks at the reasonably-priced cash bar, and free wine at each table during dinner.

George Oldham and Jo Gazzola, co-chairmen of the Very Special Event, have signed contracts with Vinary Productions to present "The Owl and the Pussycat" on Friday and Saturday, September 19 and 20, and "I Do, I Do!" on September 26 and 27. In addition, four bands have been hired. On September 19, Chappy and His Chaps will play for dancing after the show; Sep-

(Continued on page 3)

A Very Special Contract

Sid Finkleberg (left) of Vinary Productions, presents a contract for a series of dinner theatres to be signed by (left to right) Jo Gazzola, and George Oldham, co-chairpersons of the BERA Very Special Events Committee, and Marge Stoeckel, a member of the committee. The dates set for the dinner theatres are September 19, 20, 26 and 27.



The first of 27 antennas which will be arranged in a Y-configuration in the Plains of San Augustin, New Mexico, forming the Very Large Array (VLA). In the background is the antenna assembly building.

The Dawning Of A Giant Telescope

The following is an excerpt from an article written by Dr. David Heeschen, Director of the National Radio Astronomy Observatory (NRAO). The article, which first appeared in the June issue of "Sky and Telescope" magazine, focuses on the Very Large Array (VLA), a giant radio telescope being assembled in New Mexico by NRAO.

Dr. Heeschen will discuss the VLA project further when he presents the 130th Brookhaven Lecture on October 8, in Berkner Hall.

The world's largest and most sensitive radio telescope is now being built in a remote part of New Mexico. When completed in 1981, its performance will be equivalent in many respects to that of a fully steerable paraboloidal antenna 17 miles in diameter. This instrument is called prosaically but logically, the Very Large Array (VLA), because it is in fact an array of small antennas distributed over a very large area.

The history of the VLA dates back to 1961-62, when studies were begun to find ways to correct the three principal weaknesses of then-existing radio astronomy instruments. These were insufficient resolution, insufficient sensitivity, and lack of any reasonably fast ability to form images or maps. Of course, greater resolution and sensitivity have always been, and still are, major goals of radio telescope designers.

The quest gained impetus in the early 1960's when the fundamental importance of extragalactic radio sources became widely recognized. Their potential value as probes of the physics and nature of the universe was clear, but it was also evident that existing radio telescopes simply could not provide the needed observations. Despite many instrumental developments in the intervening years, the need for a VLA to study extragalactic sources is at least as great today as it was in 1961.

The VLA And Its Site

The instrument's 27 dish-shaped antennas are to be distributed in an equiangular Y-shaped configuration. The signal received at each antenna is sent back to a central control building, where it is combined with that from every other antenna, giving 351 different pairs of antennas, observing as interferometers.

While the antennas track the region of sky under observation, the interferometer outputs are accumulated for up to 12 hours and then processed to produce a map of the object or region observed. The Y-shaped pattern was adopted for the array after computer simulation of many possible arrangements showed that it would give the best overall performance.

A pair of standard-gauge railroad tracks runs along each arm of the Y, for a distance of 21 kilometers from the center. Spur tracks, perpendicular to this "main line," lead off at intervals to observing stations on which the antennas are placed. An antenna can be lifted off its foundation at one station and moved to any other by means of a special self-propelled transporter. Thus the antennas can be distributed along the arms of the Y to meet differing scientific needs. For example, when the antennas occupy the full lengths of the three arms the array has its greatest resolution. If the antennas are brought together into a more compact configuration, the resolution is reduced but sidelobe characteristics of the antenna pattern and the sensitivity to low surface brightness are improved.

A complete rearrangement of the 27 dishes is expected to require one or two days, with three transporters moving the 200-ton antennas around at a speed of five miles per hour.

The railroad tracks have other advantages. The antennas can be constructed, and their electronics installed, at a central location and then moved out on the arms of the Y to their observing stations. This is much simpler than having 27 separate construction sites up to 21 kilometers away. When the VLA is in regular operation, the antennas will be returned one at a time to the central area for regular preventive maintenance. A 28th antenna will be substituted to preserve the full array of 27 for observing. Finally, all transportation along the arms of the Y will be by rail, obviating the need for roads.

Site requirements for the VLA were simple, but quite restrictive. The array obviously needs a large, flat, relatively uninhabited and unused area. It is also desirable for technical reasons that the site be at low latitude, a high elevation, and in a dry climate. These criteria all suggest the southwestern United States, and the area west of the Mississippi and south of latitude 40° north was intensively searched. Somewhat surprisingly, very few sites were found that even minimally met the requirements.

Fortunately, one location in west-central New Mexico is almost ideal for the VLA. The Plains of San Augustin, about 50 miles west of the town of Socorro, form a flat smooth, semiarid area extending many miles in every direction. There are no towns or villages on the plain, which is ringed by mountains. The only activity is cattle ranching, which will not be disrupted by, nor interfere with, the VLA. This beautiful, unspoiled region is about 7,000 feet above sea level.

The Design Problem

The basic goal of the design studies begun in 1961 was to develop an instrument that could provide radio "pictures" of interesting sources and regions of the sky with the highest achievable resolution and sensitivity. By 1965 specific performance parameters were established, all of which have been met in the final design. The more important of these are:

- Resolution of 0.6 second of arc at an observing wavelength of 6 cm. Because resolution scales linearly with wavelength, at 21 cm., for example, the corresponding resolution is 2.1 seconds.
- Antenna beam characteristics similar to those of a conventional paraboloidal antenna. This limits the admissible side lobes, or spurious responses, of the telescope system.

(Continued on Page 2)

Off-Site
A Town Where Past And Present Cross Paths

Although many modern conveniences are a blessing, it is reassuring to know that you can step back in time to an era when ice cream parlors used real whipped cream, sailors passed idle hours carving scrimshaw and seagoing vessels were adorned with elaborate figureheads. These "things of the past" are very much a part of present day Greenport.

Situated on the Peconic Bay near the end of Long Island's north fork, Greenport still retains much of the flavor it had when it was incorporated in 1838. Many of the town's buildings date back to the early 1800's. Before 1834 Greenport was known as Stirling and records from as early as 1750 name it Winter Harbor.

Greenport's main street, opened in 1827, is lined with numerous quaint shops ranging from art studios and craft shops to bookstores, antique shops and boutiques. It is a real browsers town. Many of the craft shops are filled with examples of marine art. At the "Arts of the Sea" scrimshaw enthusiasts can see a lost art revived by a master craftsman.

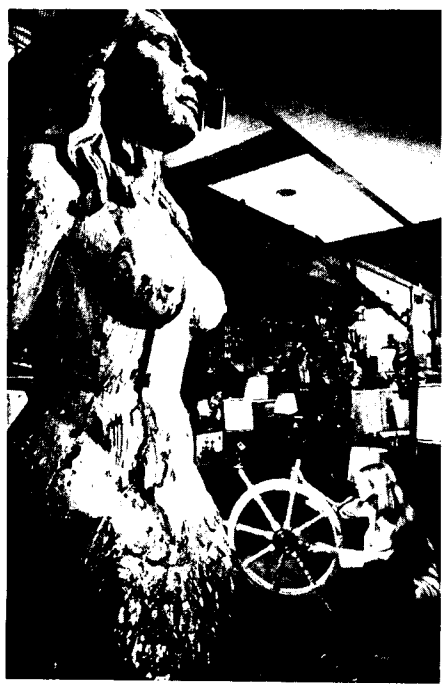
"Preston's Ship and Sea Gallery," located right on the wharf, has many examples of carved figureheads, some original and some replicas. The gallery also has seascape paintings and other arts of the sea. The gallery is part of S.T. Preston & Son, one of the finest marine supply stores in the area. At Preston's, boat owners can be assured of finding anything from apparel to boat equipment and maintenance items.

If you have a longing for a banana split with real whipped cream and sprinkles, the place to go is Razzles Ice Cream and Dessert Co. Razzles is located in Stirling Square, a small shopping plaza filled with small shops and eateries designed to melt into the surrounding 19th century architecture. Razzles is fashioned after an old-time ice cream parlor, selling ice cream concoctions and penny candy. Prices range from $1.75 for a Razzle Dazzle, a fancy name for a banana split, to 20 cents for a Foxy Pop. Lemonade is one of their biggest sellers on a hot afternoon.

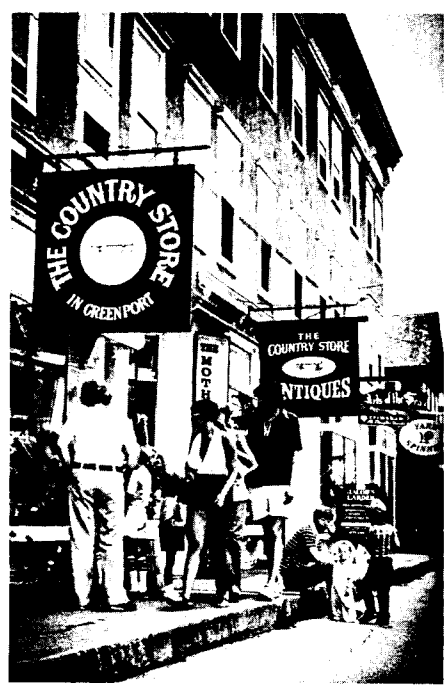
Because of its proximity to the sea, Greenport has many fine seafood restaurants. The newest restaurant opened less than two weeks ago on the site of an oyster factory that went out of production close to 50 years ago. Needless to say the restaurant is called the "Old Oyster Factory Restaurant." It is not inexpensive but has a very attractive decor and mouth-watering menu.

The Greenport area has been a leading producer of Blue Point oysters for many years. During oyster season, a person can get a box of 100 oysters for seven dollars at the Oyster Farm located in East Marion, two miles east of Greenport.

If you have a free day and want to get a flavor of Long Island's past and present, the trip out the rural north fork to Greenport is well worth it.



A 17th century French figurehead watches browsers in Prestons.



Greenport's main street is lined with many quaint shops.

Real whipped cream is not a thing of the past in Greenport.

Very Large Array (Continued)

- A "field of view" of at least a few square minutes of arc. This specifies the minimum area to be mapped in a single observation.
- Measurement of all polarization characteristics of the received radiation.
- Capability of making spectroscopic observations, covering a range of frequencies with reasonable frequency resolution.
- Provision for quick change of observing wavelength and for simultaneous observation at two wavelengths.
- Ability to observe the entire sky north of about $-20°$ declination, with the above system characteristics.
- Achievement of these results in an observing time of no more than eight hours.

Of course, many other specifications are needed to describe the telescope fully, but these eight most strongly influence both the nature of the instrument, as it has finally evolved, and the work that can be done with it. Another important parameter, sensitivity, is largely determined by details of the electronic system and the total collecting area of the telescope. These in turn depend on the current state of the electronic art and the amount of money to be invested in the instrument.

As already implied, to achieve all these results with a conventional radio telescope would require a fully steerable dish-type antenna about 27 kilometers (17 miles) in diameter, which is clearly impractical. It was decided early in the design of the VLA that the most promising approach was aperture synthesis, a concept first developed for radio astronomy in the late 1950's and early 1960's by Martin Ryle, director of the Mullard Radio Observatory in Cambridge, England. For this many other contributions to radio astronomy, he was awarded the Nobel prize in physics, jointly with his colleague Anthony Hewish.

To visualize aperture synthesis, imagine radiation reflected back to the focus from any two small areas – call them elements – of a dish-type antenna. The two reflected waves interact at the focus to produce a signal that depends on both the structure of the radiation source and on the relative position of the two elements. The output of the full antenna can be looked upon as the appropriate combination of signals produced by all possible pairs of elements that exist in the dish. If we had only two small elements, however, we could still produce the response of the full aperture by successive measurements with the two elements in different relative positions. By moving the elements around to cover all possible orientations and separations that would exist in the larger aperture, we would synthesize its response.

In practice, this can be accomplished by connecting the two small elements together as an interferometer and then making successive measurements with one of the elements in different positions However, it would be very time-consuming to synthesize a very large aperture in this way. For example, to produce a map of an object two minutes of arc in diameter with one-second resolution, such as might be obtained with an antenna 27 kilometers in diameter, would require more than 10,000 independent measurements, and one of the small elements would have to be moved between successive measurements.

The time required to synthesize an aperture can be reduced simply by using more than one pair of elements. It can also be reduced by making use of the rotation of the earth. As seen from a point fixed on the celestial sphere, both the projected separation and the orientation of a pair of elements vary as the earth rotates. Thus a single, fixed interferometer pair can produce many independent measurements, with different separations and orientations, by tracking a celestial source at is transits the sky.

The VLA uses both of thse techniques. Its 27 antennas consitute 351 separate pairs of elements, connected together as radio interferometers, and it can track a source from the eastern to the western horizon. In the process, up to a few million independent measurements are obtained, and they can be combined to produce the desired map.

Aperture synthesis has been thoroughly tested and proven in practice with the three-element array of NRAO at Green Bank, West Virginia, the six-element array at Cambridge, England, and the 12-element one at Westerbork, Netherlands. The latter two are perhaps the most powerful radio telescopes presently in existence. The VLA is a natural next step beyond these instruments, and it will provide much greater resolution, sensitivity, and sky coverage.

Current Progress

Now under way on the Plains of San Augustin, construction of the VLA will continue for several years. Already completed, building for antenna and electronics assembly will remain as part of the site maintenance facilities. A 1.2-kilometer length of railroad track is ready for the first antennas, along with antenna foundations at several observing stations.

As two antennas near completion, their electronics systems are undergoing initial tests. Late this year the two antennas should be erected and their electronics installed, so tests and calibrations can begin. By the beginning of 1976, there should be a thoroughly tested, fully operational, two-element interferomter on the Plains. It is expected that most of its time for several years will be devoted to developing calibration and observing techniques, maintenance programs, data processing systems, and related activities.

Work on a second group of eight antennas and their electronics has now begun. The central control building is being built, while the next 15 kilometers of track and Y will start early in 1976.

The U.S. Congress has thus far allocated $20,000,000 for the VLA, about one-fourth of the total amount required. If funding continues at the anticipated rate, the full VLA will be completed and in operation before the end of 1981.

By early 1977 a subarray of six antennas and the inner third of the Y should be available for some scientific observing, although construction of more elements of the array will continue to dominate activities at the site. Additional trackage and about four antennas per year will be added thereafter.

By the time the array has grown to 10 antennas, late in 1977, this will be one of the most powerful radio telescope systems in the world, and scientific observations with it should be increasingly valuable. By then, debugging, calibration, data processing, and operating procedures will be sufficiently developed that the VLA can be made available to astronomers.

The VLA will be a part of the National Radio Astronomy Observatory, whose present facilities at Green Bank and at Kitt Peak, Arizona, are open to qualified scientists, regardless of institutional affiliation. Some 60 to 80 percent of NRAO observing time is used by scientists and students from universities all around the United States.

Although extragalactic radio sources were the original primary motivations for the VLA, its basic capabilities are needed in many other areas of research. It will certainly produce exciting and important observational material on many fundamental, long-standing problems: galactic structure, interstellar molecules and star formation, the nature and sources of energy of radio galaxies and quasars, and cosmology. Even more exciting and perhaps ultimately more important are the totally new discoveries it may make, discoveries we cannot now even anticipate. This has been the history of every major new astronomical instrument, and it will surely be true for the VLA, with 10 to 100 time the power of any existing radio telescope.

Kouts Receives Award

Herbert Kouts was one of six persons to receive Atomic Energy Commission Distinguished Service Awards at a ceremony in Washington, D.C. on August 1.

Kouts headed the Technical Support Organization in the Department of Applied Science before going on leave of absence in May, 1973, to become Director of the AEC's Reactor Safety Research Programs. When the AEC was reorganized into the Nuclear Regulatory Commission (NRC) and the Energy Research and Development Administration (ERDA), Kouts became Director of the NRC's Office of Nuclear Regulatory Research.

The six awards were decided upon by the AEC before it went out of existence, and were presented on its behalf by NRC Chairman William Anders, a former AEC Commissioner.

Kouts was cited for his "courage and determination" in taking innovative measures to restore confidence in the AEC's reactor safety program and opening "new opportunities for developing safe and reliable nuclear power in the United States. He was commended for his "outstanding technical ability, his professional standing, and his sound judgement" which made him "especially valuable to the commissioners as a personal advisor in several key areas related to reactor safety."

Kouts joined the staff of Brookhaven in 1950. His major research interests have included elementary particle physics, shielding and physics of nuclear reactors. In 1963 he received the E.O. Lawrence Memorial Award.

Samios (Continued)

ical Society. He is currently Chairman of the Society's Division of Particles and Fields. He has served on numerous physics oriented committees, including the SLAC Program Advisory Committee (1967-1968), AUI High Energy Study Committee (1968-1972), Princeton-Pennsylvania Accelerator Committee (1969-1972), NAL Program Advisory Committee (1969-1974) and the SLAC Scientific Policy Committee (1972-1976). He was Secretary to Subpanel D (Weisskopf Committee, 1968) of the High Energy Physics Advisory Panel. Samios was a member of the BNL Council from 1966 to 1969; he was Chairman from 1968-1969. He is an adjunct professor at Columbia University, and this year ends his six-year adjunct professorship at Stevens Institute of Technology.

Watts In A Degree?

A reminder to those who have unit type air conditioners in their offices or labs: air conditioners should not be used until room temperatures exceed 78°. Further, there have been some cases of window air conditioners being left on after working hours in unoccupied offices and labs. In those offices and labs which will be vacant after 5 p.m., window air conditioners should be turned off by 4 p.m.

Check Mailboxes For New AUI Benefit Book

A new AUI Retirement and Group Insurance Booklet has been prepared and will be mailed next week to the home address of all active and retired employees.

The new booklet describes in general terms the principal features of the employee benefit program, which covers the Medical, Life, Long Term Disability and Travel Accident Insurance, and the Retirement Plan.

This booklet should provide employees and their families with a better understanding of their AUI benefits.

Any questions regarding these benefits should be referred to R. Schonberg, Ext. 2881.

Night On The Town (Continued)

tember 20, The Serenaders, with Ann Mauro; September 26, The M. J.B. Trio; and for the final performance on September 27, The Isotope Stompers.

The price per person for each performance is $12.50, which includes dinner, wine on each table, a two-hour play, and dancing afterwards. In order to make the evening as enjoyable as possible, attendance will be limited to 200 for each evening, so reservations are mandatory and should be made as soon as possible to get table assignments with a congenial group of friends. Announcement of reservation procedures will be distributed throughout the Lab as soon as ticket sales start.

The two shows presented are adult entertainment and will provide an evening of theatre in a most delightful manner. Table arrangements will be made for groups ranging from six to ten with a guarantee of no bad seats in the house!

Selected Reading

New Sci. 66, June 26, 1975

Our tomorrows are all their yesterdays. T. Comton. 700-1

If everything is important, nothing is important. G. Lean. 704-5

Science 189, July 18, 1975

E.F. Schumacher: Cutting technology down to size. N. Wade. 199-201

NSF Science Development Program: "Centers of excellence" revisited. J. Walsh. 201-3

Science 189, July 25, 1975

Energy and resources. B. Sørensen. 255-60

Whither the NSF? – The higher derivatives. H.G. Stever. 264-7

Major NSF reorganization announced by Stever. J. Walsh. 268

Science 189, August 1, 1975

Discovery of pulsars: A graduate student's story. N. Wade. 358-64

Pool Relay Races

Last Friday's BERA pool special was the relay races. Contestants were required to push a ping-pong ball across the pool without using their hands, walk backwards in the water and swim the width of the pool at full speed.

Each team consisted of four swimmers. Three age groups performed to the delight of the crowd of parents and friends who came to watch. Fun was had by all as wet but smiling faces emerged from the deep to receive their prizes. Next week's special is the Spoon and Cup Races. The winners were:

4-6 year olds

Jenny Small	Matt Stone
Michael Carneiro	Michelle Cromes
John Ranon	James Waite

7-9 year olds

Andrew Gordon	Mary Crystal
Brian Kralyevich	Sarah Hammer

over 10 year olds

Mike Hammer	Shin Iizumy
Danny Abrams	Peter Tinaca
Beth Hammer	Carl Gordon
Aron Rothenstein	Brian Greenhouse
Erie Sykes	Molly McQuigg
Joe Hammer	John Hammer
Paul Tinaca	Nobuo Iizumy

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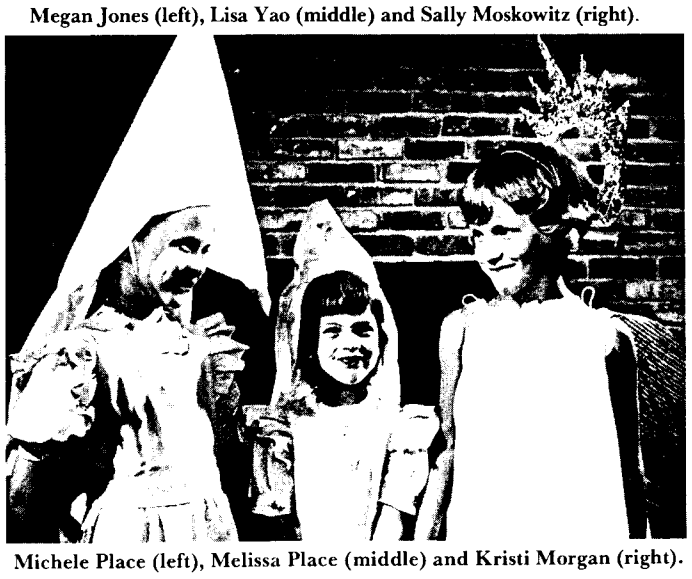
Halloween In July

Megan Jones (left), Lisa Yao (middle) and Sally Moskowitz (right).

Meipu Yang (left) and Diana Barnes (right).



Michele Place (left), Melissa Place (middle) and Kristi Morgan (right).

Johnette (left) and Gregory Robinson (right).

Bowling Notice

Bowlers interested in joining a BNL league may do so by submitting their names to the bowlers pool. New teams may also be formed from the pool. Send your name, life number, lab address and extension to: Cathy Van Noy Bldg. 134B.

Anyone interested in bowling in Shirley should also forward their names, etc. to Cathy and put "Shirley" on your note. If there is sufficient response, the board will take further steps to establish a Shirley league.

Team Captains from last year will be receiving their applications within the next few weeks. Do you have your team formed?

Arrivals & Departures

Arrivals

Peter V. Bucci	Director's Office
Philip G. McHugh	Director's Office
Upendra S. Rohatgi	Applied Science
Robert R. Rooks	Reactor

Departures

Allan L. Rosenthal	Biology
Efrain Segarra	Medical
Jantje Reiffers	Medical
James P. Vary	Physics
William M. Ryan	Applied Math

Upton Nursery School

Upton Nursery School is a co-operative pre-school for the three and four year old children of Brookhaven National Laboratory employees.

The children attend school two or three mornings a week and participate in a varied program including art, music, outdoor play, field trips, dramatic play and other activities that help prepare the children (in a fun way) for elementary school.

If you are interested in enrolling your child or wish further information please call Nancy Bieber or Linda Lynn at 924-8329.

Water Carnival Reminder

This is to remind all Lab employees that the BERA summer recreation program Water Carnival will be held on Wednesday evening, August 20, at 7 p.m. at the swimming pool.

The activities are open to all children of Lab employees from four to fourteen years of age. No child over 14 will be allowed to participate.

Prizes and treats will be furnished. Parents and friends are encouraged to come and watch the festivities.

Ghosts, Goblins, Ghouls

Holloween in July? How can this be? The surprise of the spectators was evident last Friday at the recreation building as pirates, ghosts, witches, shieks, camels and assorted monsters of all sizes and ages appeared for the annual Holloween Party of the BERA summer recreation program.

A parade of wildly costumed kids marched through the recreation hall hoping to be selected as having the best, scariest, prettiest or most original costume of the day.

The judges were amazed at the variety of colors and imaginative use of ordinary household items put together by the children to make the most fantastic outfits ever seen at this affair.

First place winners included Yuri Mishina, Johnette Kau, Mellisa and Michelle Place and the McQuigg family. Three exciting games: apple dunking, donut eating and the old favorite "Pin the Wart on the Witch" topped off a wonderful morning of fun. Next week's special is Contest Day.

Paul Greenwood (left) and Yuri Mishina (right).

Sweepstakes Winner

The first drawing of the Camera Sweepstakes was held last Friday afternoon at the BERA Sales & Services Office. The lucky winner of a Kodak Pocket Instamatic – Model 110 was George Woodson, DAS.

Another drawing will take place in September so make sure your name gets into the hat. All you have to do is have a roll of film processed and tell Thea Legrandre that you want to be entered into the contest.

Sounds of Appalachia To Fill Berkner Hall

On Wednesday evening, August 20, Jan and Kathleen Oosting will present a program of traditional music of the southern Appalachians in Berkner Hall. These two popular singers have appeared previously at Brookhaven.

The Oostings were born and raised in North Carolina. Both came from musical families, and each received training in classical music. Their interest in folk music began several years ago while Jan was on the staff of the Biology Department here at the Lab. At that time they realized that they had been exposed to a rich heritage of traditional American music. They have since appeared at many places throughout the eastern United States.

In addition to southern mountain music, the program will include sea chanteys and songs drawn from the British music halls of the 1890's. The performance will begin at 8:30 p.m. Admission $3.00 for adults and $2.00 for students and senior citizens (over 65).

Theatre Group Elections

The Nominating Committee of the BERA Theatre Group will present the following names as officers at its next meeting, Tuesday, August 19, at 8 p.m. in Stage II (Exhibit Hall):

Rita Straub, president
Don Galvin, vice-president
Gail Williams, secretary
Blair Munhofen, house
Bill Love, advisory committee
Eena Mai Franz, program

The President will accept nominations from the floor.

Readings from plays being considered as production possibilities will be offered as the program for the evening.

Cafeteria Menu

Week Ending August 15, 1975

Monday, August 11	
Cream of Mushroom Soup	
Chicken a la King on Rice	1.10
Cheese Omelet & 1 veg.	1.00
Tuesday, August 12	
French Onion Soup	
Beef Stew on Rice	1.20
Stuffed Pepper & 1 veg.	1.20
Wednesday, August 13	
Split Pea Soup	
Breaded Flounder Filet & fr. fr.	1.10
Spaghetti w/Meat Sauce Special	
Garlic Bread	
All You Can Eat	$1.00 plus tax
Thursday, August 14	
Cream of Chicken Soup	
Beef Hash & 1 veg.	1.10
Veal Pattie Parmigiana & 1 veg.	1.20
Friday, August 15	
Fish Chowder	
Broiled Filet & 1 veg.	1.10
Macaroni & Chopped Beef	1.05

Classified Advertisements

Placement Notices

Each week the Personnel Office lists personnel placement requisitions, currently being processed. The purpose of these listings is, first, to give notice of all non-scientific staff positions being filled and, second, to give employees an opportunity to request consideration for themselves through the Personnel Office. In filling vacancies, the Laboratory's objective is to give first consideration to present employees, as follows: employees within the immediate group having the vacancy, employees within the department or division, employees within the Laboratory as a whole.

For further information regarding a placement notice, or to request consideration for an available position, contact Supervisor, Personnel Placement & Development, extension 2874 or 2882.

153. COMPUTER OPERATOR - Shift work required. Administrative Data Processing. Applied Mathematics Department.

154. TECHNICIAN - One to two years experience or training in mechanical technology. Power Transmission Group. Accelerator Department.

155. TECHNICIAN - A.A.S. degree or equivalent in mechanical technology with experience in cryogenic and high vacuum systems. Silver soldering and use of helium leak detectors. Power Transmission Group. Accelerator Department.

156. TECHNICIAN - A.A.S. degree or equivalent in electro-mechanical technology to work with cryogenic systems. Accelerator Department.

157. OFFICE SERVICES ASSISTANT - Technical and bibliographical typing experience required. Library experience preferred. Technical Information Division.

158. PUBLIC RELATIONS ASSISTANT - To assist the Laboratory's Public Relations Officer. Requires demonstrated ability in solving communications problems and coordinating multi-department public relations activities and projects; familiarity with scientific writing, news releases, media contact, and scientific exhibits. Requires BA or equivalent in related field. Director's Office.

159. EDITOR - Brookhaven Bulletin. Responsible for the publication of the Laboratory's weekly employee newspaper. Requires managerial and communications skills; demonstrated writing ability; and knowledge of interviewing, editing, layout and graphics techniques. Journalism training or experience required. Director's Office.

160. STAFF ASSISTANT - Duties include the preparation of both statistical and narrative material in support of budget requests, monitoring of costs and manpower allocations versus budgets of research programs, and the preparation of cost distributions for supporting services. Exposure to automatic data processing techniques and systems desirable. Effective oral and written communication a must. BA or equivalent in Business Administration (accounting major preferable) plus 3-5 years experience in budget preparation and control. Department of Applied Science.

161. MECHANICAL TECHNICIAN - A.A.S. degree or equivalent with general mechanical fabrication and assembly experience. Vacuum and cryogenic experience desired. Solid State Program. HFBR. Physics Department.

162. TECHNICIAN - A.A.S. degree or equivalent in art plus some experience. Working knowledge of LeRoy system desirable. Graphics Arts Illustration. Photography and Graphic Arts Division.

Auto & Auto Supplies

70 FORD - 123 club wagon chateau van, 302-V8, at/r&h, 13.8 mgp, roof vent. $2000. Walter, Ext. 3499, 732-1913.

73 CHEVY TRUCK - ½ ton, stepside, c-10, 33,000 mi. Pat Jencius, Ext. 3336.

67 CHEVY MALIBU - Good for parts, battery, etc. 473-2052 after 6.

TIRES - 13" belted steel radials, good cond. $35 for 2. 473-2052 after 6.

68 CHARGER - Fair shape, no reasonable offer refused. $400. Bob, Ext. 3082, 281-4146.

67 CHRYSLER - Freeport, good cond., reasonable. W. Ryan, 369-2864 before 4.

74 DATSUN PICKUP - Under warranty, take over payment. Ron, Ext. 2621, 744-8334.

PARTS - For '66 SS Impala, 327-275hp engine, $150; Holley carb, $50; Chevy beauty rims, 4 for $40; more. Jim, Ext. 2434.

68 FORD WAGON - Custom, luggage rack, ball hitch, just tuned. $675. Ext. 3688.

73 NOVA - Auto 6 cyl, 22,000 mi, radials, vinyl roof, excel cond. $2500. Chas, 289-7383.

63 PONTIAC CATALINA - 2 dr hdtp, standard trans, antique collector's cond, excel transportation, local 17 mpg, must see to believe. Joan, 399-2084.

TIRES - 978-14 white walls, Uniroyal, fair cond. 2 for $20. R. Pynn, Ext. 3927.

TIRES - New, used, recaps, also extra rims, most sizes. Ken, 289-8212 eves.

72 INTERNATIONAL - Travelall, auto trans, ps/pb/ac, trailer pkg, 5 new tires, excel cond. $2950. 363-2024.

72 CAPRI - 4 spd, new clutch. $1750 firm. Bill Taylor, Ext. 4662, 298-4089.

MERCEDES PARTS - For 220S, body parts, transmission, starter, generator, etc, make offer. Bill Sunshine, 722-4976 after 6.

71 MGB GT - Overdrive, wire wheels, new muffler, 35 mpg, great cond. Brian Meadows, Ext. 3010.

IMP DUNE BUGGY - Green flake, many extras, for year round use. Ext. 4070, 475-7272 after 6.

72 FORD - ¾ ton pickup, V8, runs very well, good cond. $1700. Mike, Ext. 4270.

TIRES - 600x13, almost new. $18 for 2. Nick, Ext. 2534.

SPARKOMATIC - Complete converse, stick shift, new $35; 2 mag wheels, excel cond, $65. Ann, Ext. 3483 after 1:30.

68 CADILLAC CONVERTIBLE - Many extras, radial tires, very good cond. Zuarro, 731-8710.

72 SUZUKI - Dirt bike, TM400 MX. $600. 273-6388.

71 PLYMOUTH SATELLITE - Station wagon, blue, ps, ac, excel cond. Fred, Ext. 2463, 473-8622.

Boats & Marine Supplies

OUTBOARD MOTOR - 5.4 hp Evinrude Zepher. $50. Ext. 2972.

19' SLOOP - W/trailer. $1000. Ext. 3922, 744-3235 eves.

32' BALTZER - Twin Chrysler, less than 40 hrs on engine, camper back, incl summer dockage at Week's. 331-1718.

65 EVINRUDE 90 HP - All electric, excel cond, new water pump. $375. 363-6521.

16' COMET - Dacron sails, stainless rigging, bronze fittings. $350 firm. John, Ext. 3675, Don, 444-2217.

24' CATBOAT - Marie, classic gaff rig, needs saving. $1500 for a labor of love. Max Small, 286-8886.

30' CRIS CRAFT - '58 lap strake hull, sleeps 6, twin 283 cu in engine, one season on engines, fresh water cooled, fly bridge incl, controls not hooked up, boat w/mooring in Mt. Sinai Harbor. 585-2047.

ALUMINUM PROP - 10"x11" for 75 hp or larger Johnson/Evinrude. $10. Bob Doering, Ext. 4474.

BOAT TRAILER TIRE - 4.80-12, like new. $12. John, Ext. 3354.

EVINRUDE OUTBOARD - 40 hp, 1970, excel cond. $350. Steve, 286-1235.

RADIO - Bimini 550, ship to shore, new, never used. $35. 265-1072.

DEPTH FINDER - Dolphin 120, new still in box. $60 firm. 265-1072.

16' CAPE COD - Gemini fiberglass, dacron sails, Herishoff design. 751-1097.

67 PEMBROKE - 28' twin 190, flying bridge, radio ship/shore, refrig shore power, sleeps 5, stand-up head, boat cover. $7500. 473-1440.

24' ZOBEL - Hard top sea skiff, 125 hp Chryslers, crown large cockpit, excellent bass boat, good cond. $1000 or best offer. 363-6037.

12' SEA DEVIL - Sailboat. $100. Frank, Ext. 4581, 588-3565.

Miscellaneous

ANTIQUE OAK CHAIRS - 3 matching, refinished w/new cane seats; range hood, white w/2 spd exhaust fan. 363-6597.

GERMAN SHORT HAIR - Pointer AKC, good lines, stud service for pick of litter. 589-1069.

CAR STEREO - Audiovox, 8 track deck w/5¼" GE speakers in deck mounting cabinets. $45. Chuck, Ext. 3512.

ELECTROLUX VACUUM - Hardly used, all attachments, extra bags, auto cord rewind, auto pop bag, good cond. $35. Oster, Ext. 4763.

BUNK/TWIN MAPLE BEDS -W/mattresses, original cost about $350, asking $125. Ext. 3380, 286-1454.

10 SPEED BIKE - Sears, toe clips etc, good cond. $40. Mark Powell, Ext. 2260, 259-0644.

RUG - Austrian loom tufted wool 8½x15½, multicolored, excel cond, cleaned. 289-0567.

HEATHKIT - Vectorscope/color gen, model 10-101. George, Ext. 3783.

MINI BIKE - Thunderbolt 125, 3½ hp, 148 cc, w/helmet. Original cost $150, sell $75. 981-5993 after 6.

PROPANE GAS BOTTLE - Trailer size, $5. Dale Miller, Ext. 2022, 281-8579.

ROPE - ½" asst lengths. Dale Miller, 281-8579 after 5.

HI RISER - W/bolster & blue covers, excel cond, only slightly used. $50. Fred, Ext. 2463, 473-8622.

BICYCLE - 20" Sears spyder, $15; folding ironing board w/cover, $3; ladies hair dryer w/manicure set in case, $4. Ron, Ext. 4310, 345-3206 eves.

CAMPING COTS - Morsan collapsible metal frames, 4 available, $3 each; 3½" swivel vice, $4; ⅜ vari speed & reverse Sears drill, $15. Ron, Ext. 4310, 345-3206 eves.

2 BOTTLE CAPPERS - Old, but in working cond. $3 each. 727-1329.

POOL TABLE - Regulation slate top w/pool cues. $500. Ext. 3172.

CLOTHES DRYER - RCA whirlpool, works well, $30; GE washer, needs work, $10; both for $35. Don, Ext. 4618.

20' COACHMAN TRAVEL TRAILER - Sleeps 6, stove, refrig, heater, head & shower, 110 & 12 V lighting, snow tires, tape deck. $2995. Ext. 3848, 472-0553.

LADY'S BICYCLE - Raleigh sprite, almost new, 5 speed, excel cond. $65. Ohska, Ext. 4825.

POOL COVER - Brand new, 20x40, in original box, never used. $75. 928-7993.

FIRE PLACE - Curved screen top & utensils, $25; 3 cellar window guards, $8. 928-7993.

CONVERTIBLE SOFA - Nagahide, 1 yr old, dark brown, full size bed, like new, original price $395, asking $145. Al, 924-8411.

DREXEL CHINA CLOSET - Fruitwood w/pecan finish, like new. $350 or best offer. 928-7993.

MOTOROLA - 8 track car stereo, needs some mechanical work, but will play beautifully when fixed, $3. Pat, Ext. 3692.

ANTENNA - C-B cutter. $12. John, Ext. 3354.

COCKAPOO PUPPY - 3 months, black female, wormed w/all shots. $55; also free tiger kitten. 281-5296.

AIR CONDITIONER - 18,500 btu, excellent, $150; dishwasher, $30; infant car bed, $10; child's spring horse, $10. 289-5664.

TELEPHONE LENS - Sears 200 mm for 35 mm camera w/pentax mount. $75. M. Titmus, 928-9078.

UNIVOX AMP - 70 watt (2) 10" speakers, very good cond. $80. Ask for Rich, 722-3251.

DISHWASHER - GE portable, cutting board top, front loading, avocado green. $75 firm. 286-3377 after 6.

FISH TANKS - Or terrariums, large, cheap. Ext. 4058, 286-0436.

CURLING IRON - Crazy curl, used once, $10; winter jacket, clean, good cond, size 13. $5. Jolie, Ext. 3993, 698-4967.

FLY ROD & REEL - Cortland Pro-crest. $40 new, used twice. $25. 286-1454.

HIKING BOOTS - Dunham, size 8-8½, high quality stitched Vibram sole, excel cond, orig $50; asking $25. 286-1454.

TENT - 9x9 umbrella style, poles lacking. $25. 286-1454.

AIR CONDITIONER - Whirlpool, 9000 btu, 115 V, 12 amps. $75. Ext. 3397, 286-2798.

ANTENNA ROTATOR - Automatic control, station & outdoor motor unit. $10. Ext. 4240.

FILTER & PUMP - For swimming pool, good cond. $18. Ext. 4240, 286-0295.

CANNING JARS - 1½ dozen, quart size, most with lids, some never used. Jean, Ext. 2902.

ROTOTILLER COMBO - Sickle bar plus lawn roller, rear mounted tires. $150. Ext. 3688.

ROPE LADDER - Exhaust fan, 36"; kerosene heater. Ext. 3688.

PINTO PONY - 3 yrs old, saddle, bridle, blanket, rides, & drives. 289-1235.

ENGLISH PRAM - Marmett, 3 yrs old, $150 new, asking $20; men's set Wilson golf clubs, 3 yrs old, excel cond, $80. Ext. 2910, 286-1451.

AM/FM RADIO & TURNTABLE - For built in; 2 speakers, 1 large, 1 small, $35, for den or play room. 265-1072.

CHORDETTE ORGAN - Estey 306, maple tone, good cond. $50 firm. 265-1072.

POP UP CAMPER - Apache Ramada, sleeps 8, stove, icebox, sink, heater. 732-3135.

GOLF BAG & CLUBS - Ext. 2350.

KITTENS - For adoption, gray & white or black & white, available around end of August. Ext. 3771, 878-0471.

DOUBLE BED - W/mattress; twin bed; rug; table lamps, good cond. 473-0649 eves.

4 FREE KITTENS - Bill Taylor, Ext. 4662, 298-4089.

BASSETT BOOK CASE - W/2 door storage area beneath, walnut. $100. 928-7993.

REFRIGERATOR - Whirlpool coppertone, 14 cu ft w/separate freezer, excel cond. $100. 928-7993.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

GLEN COVE - 2 story colonial, by water. $80,000 firm. 676-8396.

ROCKY POINT - Transferred, reduced $6000, 4 bedrm colonial, fireplace, in-ground pool, fence, finished basement. $52,000. 744-2986.

EASTPORT - 3 bedrm, large eat-in-kitchen, dining room, large living room, full basement, 1 acre. 325-0715 anytime.

For Rent

SHOREHAM NORTH - Furnished house, 2-3 bedrm, 1½ baths, 2-car garage, wooded acre on Sound cliff, beach rights, avail Aug 24, 1975 - Sept 1976. Claus, Ext. 4846, 744-2017.

DUPLEX - 2 bedrm apt w/basement, 5 min to Lab. $280/month includes heat. 581-2909.

TO SHARE - With another gal a nicely furnished 2 bedrm, 2-car garage house 5 miles from Lab. E.M. Franz, Ext. 4337, 924-5294 eves.

HOUSE TO SHARE - 7 miles from Lab. Jack, Ext. 4255, 289-6708.

SMALL HOUSE - 2 bedrm, water view, 15 min from Lab, available Sept 1. Ext. 3482.

WADING RIVER - Completely furnished large 3 bedrm house, large 2-car garage, fireplace, fenced ½ acre wooded lot, includes private beach. $325/month. Ext. 3535, 926-6787.

BELLPORT - 3 bedrm furnished house on 1½ acres, near bay, available for 1 yr from Sept 1, 1975. Ext. 4581, 286-8639.

FURNISHED ROOM - Kitchen privileges. 585-3784.

Wanted

SMALL BOAT TRAILER - For 11' boat. Ruth Ann, 744-5741.

MINI REFRIGERATOR - 110 V for student. John, Ext. 4742.

RELIABLE SITTER - For 2 children for Aug, some days, some eves, will guarantee weekly minimum. Teplitz, Ext. 4886.

PROPANE GAS TANK - 20 lb w/fittings. R. Dryden, Ext. 4728.

BUY, RENT, BORROW - Steamer trunk(s) until Sept 76 for use on trip to France. Claus, Ext. 4846, 744-2017.

FLOOR JACK - Automotive, ½ ton - 1 ton. Ken, 289-8212 eves.

PUPPY OR DOG - House trained, likes children, would prefer male thoroughbred. 298-8455.

HOUSE - 3 bedrms w/basment & fireplace within reasonable distance to Lab. Ext. 2495, 732-3895.

BABYSITTER/HOUSEKEEPER - In my home, Bellport, 3½ days/week, starting Sept, must have own car. 286-1396.

USED PHOTOGRAPHIC EQUIPMENT - Enlarger, chemical trays, neg developing tank, enlarging easels. Reasonable price. Hugh, 732-6678.

HOME - For 2 yr old German shepherd, black & brown w/AKC papers, good w/children. 286-3377 after 6.

TRICYCLE - For adult. Saxon, Ext. 3435.

3 SPD MANUAL TRANSMISSION - To fit 6 cyl '59 Ford, in or out of car OK. 281-7113 eves.

12 V STORAGE BATTERY - 60-84 amp hr rating. 281-7114 eves.

TO RENT - House, 2-3 bedrms, Holbrook area, Sept 1. Judy. 744-1548.

MODEL AIRPLANE ENGINES - Size 40 or larger, any condition. Frank, Ext. 4120 after 2.

Carpools

SELDEN - Want to join or form daily or occasionally, flexible schedule. Jolie Cizewsyi, Ext. 3993.

Services

PAINTING - Interior, exterior. Ken, 473-4757.

FISHERMEN - Do you want your catch deliciously smoked? 744-9411.

HEMS & ALTERATIONS - Reasonable rates. Sharon Rosenhagen, Ext. 3334, 585-8457.

HAVE TRUCK - Odd jobs done, cellars, yards, garages cleaned, light hauling. 727-1329.

TREE SERVICE - Removal, pruning cabling, chain saw work, seasoned oak cord wood. 727-1329.

EXPERIENCED AUTO MECHANIC - Tune-up, brake job, etc. All work guaranteed. Ted, 473-3068.

MUSIC FOR ALL OCCASIONS - Anne, Ext. 3336.

PAINTING - Interior, exterior, seamless guttering, college seniors, 5 yrs experience, many references. 751-6431.

AUTOMOTIVE AIR CONDITIONING - Leaks checked, evacuated & charged as needed, by appointment. 744-3312 eves.

VW MECHANIC - Dealer trained, lowest prices, guaranteed work. Fred, 924-3556.

LOCK & KEY SERVICE - Boat & car keys by code, combinations changed. Charlie, Ext. 2957, 744-3312 eves.

ASPHALT PAVING - Bob, 475-4382.

ANTIQUES FAIR - Aug 12 & 13, noon to 10 pm, St. James Parish Hall, Beaver Dam & Bay Rds, Brookhaven, benefit Brookhaven Memorial Hospital.

Classified Ad Policy

Deadline is 12 noon Monday for publication Friday of the same week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Firearms offered for sale or trade may not be brought on site.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated.
7. Ads should be restricted to 20 words or less and typed or printed on the form provided, and must bear the employees signature.

☐ For Sale: Auto & Auto Supplies
☐ For Sale: Boats & Marine Supplies
☐ For Sale: Miscellaneous
☐ Wanted
☐ Carpools
☐ Lost & Found
☐ Services

Check [x] the heading applying to your ad.
Print or type your ad in 20 words or less.

Ads concerning property for sale or rent cannot be accepted on this form. Special Real Estate Ad forms are available at the Office of the Brookhaven Bulletin, Room 111, 40 Brookhaven Avenue.

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(Name & Phone No. To Call)

Employee's Signature..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 460, 40 Brookhaven Avenue (Ext 2345).