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NEWS

Governor Mario Cuomo will deliver the keynote address at the 30th commencement May 20.

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CHAMPION

Sarah Lenchner becomes Stony Brook's first NCAA national champion.

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CLEAN-UP

Stony Brook's annual Campus Clean Up scheduled for April 27; Community Day set for May 5.

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UNIVERSITY AT STONY BROOK • SUNY •

CURRENTS

APRIL 1990

VOLUME 8, NUMBER 3

FOCUS: *RESEARCH*

Our Endangered Planet

Stony Brook investigators circle the globe in a race to answer: How bad is it?

By Sue Risoli

The endangered environment is back in the news—and back in our hearts and minds.

This year's April 22 restaging of Earth Day—that communal awakening of ecologic concern—is one sign that we're thinking about our future again. But researchers agree that the planet can't be saved in a day.

With time running out, Stony Brook scientists are searching worldwide for answers. Some are devising tools and strategies that are faster, more effective and more accurate than methods currently used to study the environment. Others are raising the consciousness of decision-makers, or crossing traditional disciplinary lines to pool their resources.

Whether they work in the jungles of Costa Rica or the ice fields of Antarctica, they say their common goal is gathering the information we need to stop the destruction-before it's too late.

Disappearing Ozone

Though the National Aeronautics and Space Administration (NASA) has been monitoring the ozone layer for years, their satellite data have often proved unreliable. Now they've asked Stony Brook's Philip Solomon to head a worldwide network of stations that will measure ozone depletion from the ground for the next 15 years.

It was Solomon and physics professor Robert deZafra who in 1986 found the first evidence that the Antarctic "ozone hole" was caused by chlorine from manmade chemicals. This year Solomon, a professor in the Department of Earth and Space Sciences, has received an initial NASA grant of $295,000 (with several thousand more to come each year) to set up and supervise ground-based observation stations to measure chlorine oxide, the major indicator of ozone depletion in the atmosphere. Chlorine oxide is a byproduct formed when the chlorine from chlorofluorocarbons in spray cans, refrigeration systems and foam furniture attacks ozone molecules.

"Satellites can cover the whole world, but you can't check your instruments very well," says Solomon. "They drift, so you can't trust long-term measurements. We need ground-based observations to complete the picture."

Automated equipment to be placed at the stations (an improvement that Solomon says will send back more data faster than the currently used human-operated machines) is now being built according to Solomon's specifications.

All data collected will be relayed back to Stony Brook for analysis. The five stations—one in Hawaii, the others at locations not yet determined—will be staffed by groups from a dozen research institutions.

Although a stay in Hawaii sounds like a day at the beach compared to Antarctica, Solomon says it isn't so. "We'll be on top of a dead volcano where nothing grows. At 14,000 feet it's difficult to breathe. It gets pretty cold, too."

Solomon's Antarctic partner, de Zafra is modifying equipment used on their expedition to monitor even more of the trace gases that affect ozone. He is eager to return to the frozen south to investigate puzzling fluctuations in the ozone hole there.

"In 1987 we saw the worst ozone depletion ever recorded," he recalls. "In 1988 it was very mild. Last year it was quite severe again, but the hole ended three weeks earlier than would normally be the case. We need to examine it closely before we come to any conclusions."

Soloman and deZafra are part of a group of Stony Brook scientists who work under the auspices of the Institute for Terrestrial and Planetary Atmospheres. The Institute, a group of seven faculty and 18 graduate students from the departments of physics, mechanical engineering and earth and space sciences, was created last year to study such environmental problems as global warming, acid rain and ozone depletion.

"The Institute provides a focus for the considerable amount of atmospheric research that was already going on here," says director Marvin Geller, former chief of the laboratory for atmospheres at NASA's Goddard Spaceflight Center. "Starting from such a good base, it's realistic to expect us to become an acknowledged center in graduate education and research." Other plans include the creation of an undergraduate concentration, or possibly a degree program, in atmospheric sciences.

Head in the Clouds

There's a line from the pop song "Both Sides Now" that goes, "but clouds got in my way." Climate scientists might have been tempted to adopt it as their official anthem, were it not for Stony Brook's Robert Cess.

Cess's conclusions on clouds and their role in global warming are making it easier for scientists to predict how quickly the "greenhouse effect" is advancing. "For years, clouds were the Achilles heel of those who used computer models to study global warming," says Cess. "They cool the Earth by reflecting solar radiation but warm it by trapping infrared radiation emitted by its surface. So we were unsure of the overall influence of cloud cover."

Cess and collaborators from NASA's Earth Radiation Budget Experiment (ERBE) have concluded that clouds have a net cooling effect but can't be counted on as barriers to the greenhouse phenomenon. It's a first step

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Sue Risoli, who covers research at Stony Brook, coordinated the writing of this issue.

APRIL 1990

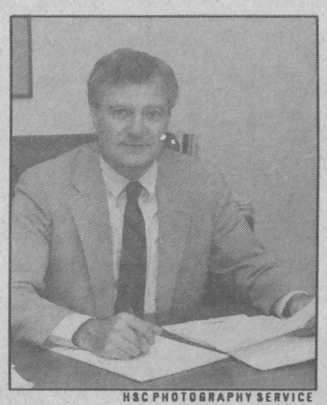
CURRENTS

VOLUME 8, NUMBER 3

Where Doers and Learners Meet

Research in universities is a code word signifying all those activities that produce the content of our teaching: seeking new knowledge, perfecting skills, creating works of art and literature, rising to the disordered challenges of the real world.

At "research universities," doers come together with learners on the theory that the conditions of success are too subtle to transmit except by direct contact. The faculty are teachers not by profession but by their natural inclination as scholars to propagate their insights.



HSC PHOTOGRAPHY SERVICE

John Marburger

To the extent that the learners require tricks of pedagogy to whet their appetites or to ease the digestion of uncooked knowledge, this can cause trouble. Society's intent to make such education widely available, a relatively recent phenomenon, obliges us to pay more attention at the faculty-student interface.

The preoccupation with pedagogy—how to get research faculty to use more of it, and how to get their students to need less of it—is a theme within a larger question touching research universities world-wide: How best to capture the power and vitality of a research faculty to produce the best undergraduate education?

Those Stony Brook people impatient with this question need to know that it is now asked everywhere in universities of our sort. It is in itself a worthy subject for scholarship, and provides its own opportunities for excellence and leadership. Faculty not engaged by this question need to wake up and worry whether society will sustain an institution so expensive if there is too much slippage at the interface with students.

That worry is another global theme: Will society continue to support research universities at their current high and rising expense? The demands upon us are great. Expectations are unrealistically high. But our insistence on yet higher levels of support is provoking an irritable response. Society wants to know how its investment is being managed, how it is helping with the big problems like drug use, corporate greed, environmental spoilage and meanness of spirit.

That we have no easy answers is to our credit, but disappointing to impatient public officials. American society has built itself a standard of living on thin economic ice now threatened by the changing season of world affairs. Vision is shortening in proportion to public resources. Our arguments for support must become more cogent, must speak to the problems of our patrons, must reveal self-consciousness of our responsibilities.

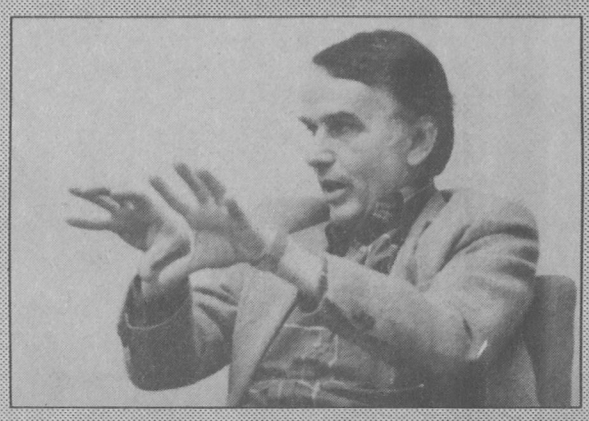
Stony Brook has made its case especially well. We enjoy tremendous support from our sponsors. We rank among the nation's leading research universities (according to the *Chronicle of Higher Education Almanac*), the only New York public institution on that list.

In New York State we share with only Cornell and Columbia a place in the top 20 National Science Foundation-funded universities. Faculty awards and honors place us first among public universities in the entire Northeast, according to a study by the University of Massachusetts. And the growth of sponsored work is balanced, not dominated by a single sponsor, and spread among many departments. From anthropology to z particles, work at Stony Brook is drawing national acclaim.

This issue of *Currents* records a few of Stony Brook's successes in the broad domain of research and scholarship. It suggests why society has placed its confidence in us through tangible support, and shows why more is justified.

John Marburger
President
University at Stony Brook

FOCUS: *RESEARCH*

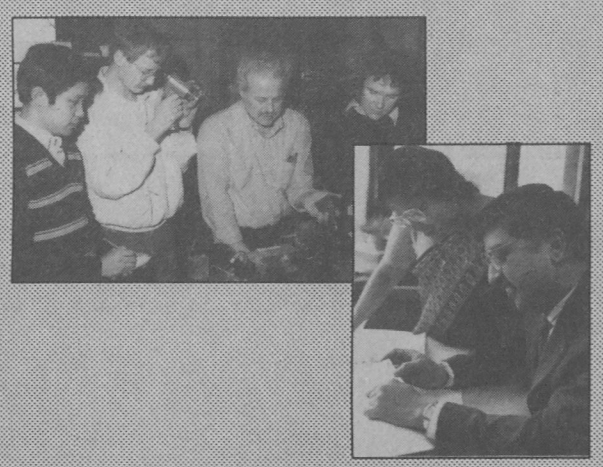


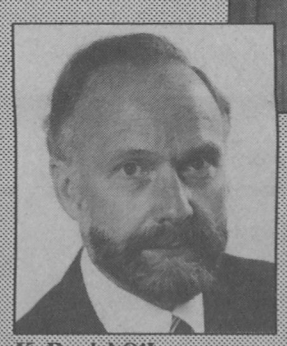
4 Big Science vs. Little Science
Or is it big politics vs. big science? Stony Brook faculty discuss the future of research.

6 The Animal Rights Challenge
Confronting increasing challenges by the animal rights movement, Stony Brook investigators are taking a more active role in communicating the importance of animal research to the public.

8 The World's Coldest Temperatures
Summer is near, but one place on campus will remain cold.

8 The Many Facets of the English Language
Our language is actually a collection of several languages say linguists Kamal and Shikaripur Sridhar.





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Aldona Jonaitis '69, living a childhood fantasy; Thomas Cravens '70, mysteries of the universe; Maureen Duggan '86, the nightmare of alcoholism.

10 The Innovators
Research conducted by Stony Brook faculty has made an impact on several fields of study.

20 Perspectives
Robert F. Schneider addresses the bureaucratic accretion that accompanies research funding.

CURRENTS MONTHLY EDITION
"Perspectives on Research"
with Craig Evinger, Philip Solomon and Myrna Adams
Thursday, April 26
6:30 p.m.
WUSB 90.1 FM

Coming Next Month

FOCUS

BOOKS AND AUTHORS

- Louis Simpson
- The teaching of writing
- Selections from Stony Brook authors

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Our All-In-1 address is CURRENTS.

Center to Coordinate Maglev Development

A center to coordinate research, development and funding for "maglev," the high-speed train that experts say will herald the transportation of the future, has been established at the Center for Regional Policy Studies at Stony Brook.

The Center for Regional Policy Studies, established here last October, serves as a nonpartisan think tank for regional public policy issues. It is headed by Lee E. Koppelman, executive director of the Long Island Regional Planning Board.

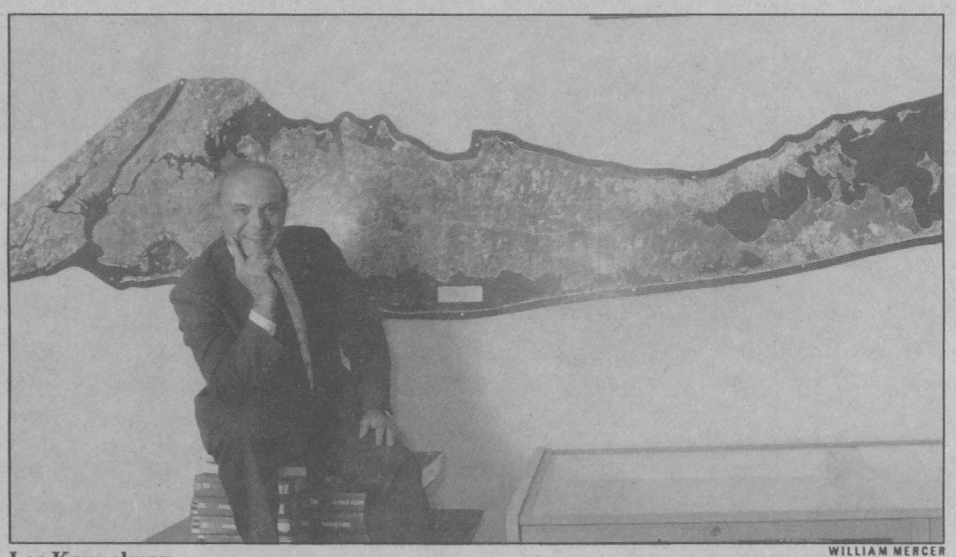
"The opportunity to develop maglev is a significant gain for Long Island," said Koppelman, who announced his center's role at an all-day maglev seminar at the World Trade Center Feb. 23. The seminar, hosted by the Port Authority of New York and New Jersey, was sponsored by Stony Brook, Stevens Institute of Technology and New York Institute of Technology.

"If we're trying to find a substitute for the defense industry on Long Island, we should take advantage of the high-tech infrastructure that already exists in the region," Koppelman said. "I believe we have the capability to move the state of the art forward to the next generation of maglev operations."

Maglev, a contraction for "magnetic levitation," is a high-speed train that literally floats on air. Noiseless, clean and free of pollutants, the train rides on magnetized air gaps that can exceed 300 miles per hour. Magnetic levitation research has been conducted in the United States since the early 1970s, and maglev prototypes have been built in Germany and Japan.

"Since the issue of maglev goes beyond engineering technology and includes issues of public policy and regional economic development, the Center for Regional Policy Studies is an obvious center to sponsor coordination of all these efforts," Koppelman said. According to the transportation segment of the Comprehensive Plan for Nassau and Suffolk, released in February by the Long Island Regional Planning Board, the high-speed maglev trains trains offer the most promise for the future of transportation on Long Island.

Stony Brook's departments of physics, engineering and economics, Brookhaven National Laboratory and Grumman Corp. will also be involved in the maglev project, Koppelman said. Brookhaven scientists Gordon Danby and James Powell hold several patents on maglev technology and are credited with the first linear motor maglev system and Grumman Corp., a leader in airframe design and construction, has long been involved in maglev technology.



Lee Koppelman

WILLIAM MERCER

According to Koppelman, funding for the initial research and development effort will cost $750 million, which includes construction of a linear test run approximately 20 miles long and a prototype of the new train. The next phase will include actual construction of the system at a cost of several billion.

"Sen. Patrick Moynihan (D-NY) has exhibited very strong interest in having the federal government support these initiatives," said Koppelman, who will seek both state and federal funding for maglev development on Long Island. "The project represents a major economic potential for Long Island, the state and the entire northeast corridor," he said. "It could help restore America as a premier developer of high-tech solutions in the field of transportation."

Eleven Receive Excellence Awards

Six faculty members, three staff members and two librarians have been selected as this year's recipients of the President's Award for Excellence.

Faculty members receiving the President's Award for Excellence in Teaching are Harriet Allentuch, professor of French and Italian; Lou Charnon-Deutsch, professor and chair of the Department of Hispanic Languages and Literature; Paul G. Kumpel, professor of mathematics; Joseph W. Lauher, professor of chemistry; Frederick Miller, chair of the Department of Pathology; and Judith Tanur, professor of sociology.

The winners of the President's Award for Excellence in Professional Services are Mary Bernero, curator of biological material for the Division of Biological Sciences; Marilyn Goodman, assistant dean, School of Social Welfare; and Carmen Vazquez, associate director of the Department of Student Union and Activities.

Arlee May, associate librarian of the Biomedical Library, and Donna Albertus, head of the Computer Science Library, are recipients of the President's Award for Excellence in Librarianship.

These awards, which carry a cash prize of $500 each, were presented at a reception April 12 hosted by President John Marburger and the Professional Employees Governing Board. All the honorees have been nominated for the Chancellor's Awards for Excellence given by the Office of Scholarly Programs of the State University of New York in Albany.

President's Award recipients were selected after a formal solicitation for nominations in each category was made to the faculty, the senior professional staff, and representatives of the student governance structure. Those nominated were then reviewed by a selection committee composed of faculty, administrators, professional staff and students.

Harrison Named Director of Pollock-Krasner House

Helen Amy Harrison, curator of Guild Hall Museum in East Hampton and an art critic for *The New York Times*, has been appointed the new site director of the Pollock-Krasner House and Study Center.

Her appointment was announced in March by James Rubin, chair of the Department of Art, where Harrison also holds an appointment as an adjunct faculty member. The two-acre site in the Springs section of East Hampton is the former home and studios of the late artists Jackson Pollock and Lee Krasner. It is operated as a museum and a study center under the auspices of the Stony Brook Foundation.

"I want to develop the Pollock-Krasner House into an active and progressive learning center, not keep it as a shrine to Jackson Pollock and Lee Krasner," Harrison says. Her initial priority will be to work on an oral history program by videotaping artists in the East End who were part of Pollock's and Krasner's circle of friends.

She is seeking donations of materials for the center's archives, particularly primary documents relating to post-World War II American art. These materials will be made available to art students at Stony Brook who are working on dissertations.

Harrison has worked as an independent research and curatorial consultant for the Queens Museum, the 1982 World's Fair, the City of New York Department of Parks, and the Corporation for Entertainment and Learning in New York, among others, and was on the faculty of the School of Visual Arts in New York. She has published extensively in scholarly journals, exhibit catalogues and gallery publications, and has organized numerous exhibitions.

Harrison succeeds Meg Perlman, who opened the studios of the late artists to the public. It was Perlman who discovered the paint-spattered floor hidden under sheets of Masonite tile in the barn that was Pollock's studio.

Helen Amy Harrison

ANN CHWATSKY

Mario Cuomo to Deliver Commencement Address

New York State Governor Mario Cuomo will deliver the keynote address at Stony Brook's 30th commencement exercise, beginning at 11:00 a.m. Sunday, May 20.

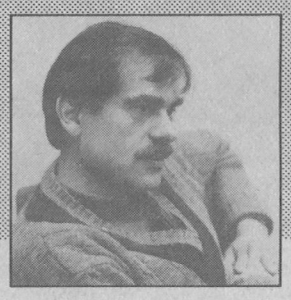
Stony Brook will also award three honorary doctoral degrees on that occasion. Economist Gary S. Becker will be awarded a Doctor of Science degree for his research methodology and insights into human behavior and institutions. Chemist Paul C. Lauterbur will be awarded a Doctor of Science degree for his pioneering contributions to the field of nuclear magnetic resonance. Former Stony Brook president and physicist John S. Toll will be awarded a Doctor of Humane Letters degree in recognition of his contributions to the university during his tenure as president.

Becker, a professor at the University of Chicago, is one of America's most original and influential economists. The scope of his work has gone beyond the traditional boundaries. Becker himself extended those boundaries by demonstrating how basic economic principles can be used to analyze such diverse phenomena as discrimination in labor markets, the formation of human capital, crime and punishment, and the allocation of time within families. His contributions to research, in both method and content, have greatly influenced the work of faculty in the Department of Economics at Stony Brook.

Lauterbur currently holds a joint appointment in the Department of Chemistry and the Medical School at the University of Illinois, Urbana-Champaign. He has received international recognition for his contributions to the field of nuclear magnetic resonance (NMR) and for his discovery and demonstration of NMR imaging. His work also provided the first examples of applications of NMR to medicine. From 1963 until his retirement in 1985, Lauterbur was a faculty member at Stony Brook where he conducted his pioneering research.

Toll, currently president of the Universities Research Association in Washington, D.C., is both a widely respected physicist and university administrator. He served as president of Stony Brook from 1965 to 1978. Toll left Stony Brook for the University of Maryland, where he served as chancellor until assuming his present position in December 1989.

Approximately 4,000 students will receive degrees. The ceremony will honor the class of 1990, which consists of those who have completed degree requirements for August 1989, December 1989 and May/June 1990. August 1990 degree candidates are invited to participate in the commencement ceremony.



Big Science vs. Little Science

The days of the lone scientist toiling in the laboratory may be numbered. Today researchers are more likely to work in multi-institutional—even multinational—collaborations involving hundreds of people.

Currents *asked Robert Crease, Paul Grannis and Wolf Schafer to talk about "big" science vs. "little" science and discuss the societal, scientific and ethical issues surrounding this new trend in research.*

Robert Crease is an assistant professor of philosophy at Stony Brook and historian at Brookhaven National Laboratory. He teaches the philosophy of science and the philosophy of art. He is the co-author of The Second Creation: Maker of the Revolution in Twentieth Century Physics *(published in 1986), and has just completed another book, to be published next year,* The Nature of Scientific Experimentation.

Paul Grannis, professor of physics, divides his time between the Stony Brook campus and the colliding beam accelerator at Fermi National Accelerator Laboratory. He's leader of a $55 million Department of Energy project at Fermilab, a collaboration among 22 institutions and 200 physicists. The project will produce subatomic collisions of energy three times greater than that produced before, which will enable scientists to search for new particles and look inside others.

Wolf Schafer, associate professor of history, studies science and technology and European intellectual history. He is the author, co-author or editor of six published and two forthcoming books. Schafer's current research is a social history of science and technology studies between 1930 and 1960. He came to Stony Brook last year from the Max Planck Institute in Starnberg, West Germany.

CURRENTS: How long has the move toward "big science" been developing?

SCHAFER: Since the mid-19th century. However, it became obvious after World War II. Then, Derek de solla Price wrote a book called *Little Science, Big Science* in 1963.

CREASE: Another landmark was the founding of the first national laboratories in the United States in 1946 to 1948. Before this time, most big laboratories were run by universities or corporations. Now there were huge labs run by consortia of institutions who pooled their resources. This move was partly forced on science by the development of such instruments as particle accelerators and nuclear reactors, which were beyond the resources of single institutions.

SCHAFER: What is usually cited as the beginning of big science is the Manhattan District Project. By the end, the project had 250,000 people working on it. Other examples from the 1940s were radar, penicillin, all the rocketry research and electronic computers.

CREASE: What effect have these large collaborations had on the career of scientists? Fifty years ago, it was possible that an investigator could design and prepare an experiment in the morning, and perform it that afternoon. That's no longer the case. Has this changed the kind of people attracted to science as a field, and the way they advance in it?

GRANNIS: It affects your career, certainly in some ways, because the cycle of building an experiment and getting some kind of results is very long.

SCHAFER: Big science has to have big subjects, doesn't it?

GRANNIS: Yes, otherwise you couldn't attract people to spend the length of time on a particular question, and you can't interest the agencies in providing money, and you can't convince society that it is in its best interest to have the work go on. But the daily working conditions for 90 percent of the people in these large projects differs not so much from that of small scientists.

There are surely some differences, though. You have to coordinate. You can't do something that doesn't fit with everyone else. That means there's politics, internal politics. You need communications skills. Those who communicate well tend to do better in these large groups than those who don't.

SCHAFER: Big science must look different to the leaders of a big laboratory. They have to think about "the society," "the government" and "us." The projects—the genome project, cancer research, space research, all research linked to defense—automatically involve public opinion and government. I'm not saying big science is a big problem, but it has reached the scale of big politics.

GRANNIS: Absolutely. And in that sense all of science has become big. Procedures and oversight have filtered down to smaller projects as well. There are just as many review panels.

SCHAFER: Would you say that big science generates big results or not? Big science, little discoveries?

GRANNIS: Well, do you ask the managers in the sense of the government people, or do you ask the scientists who are doing it day by day? If you're going to spend a lot of money on one umbrella, the bureaucrat needs to see there is a large goal.

In fact, there's a little bit of progress here, building on someone else's insights there. But large projects very often might be viewed as not having succeeded without making some discovery that was worth an astonishing sum. And that probably is dangerous because it means that some kinds of speculative research that might lead to actual discoveries won't get done.

SCHAFER: As long as modern science has been around—since the 17th century—we have made fundamental discoveries via little science. If you look at science since World War II, would you say that big science paid off in terms of our understanding of nature in a dramatic way, as it had in previous centuries when there was very little money and rather tremendous insights?

GRANNIS: I think in fact if you look at the last 40 years, big discoveries often came from big projects.

SCHAFER: As big as Einstein or Max Planck?

GRANNIS: There have not been many things as major as Einstein's relativity; however, recently there has been a unification of the basic forces that rivals that. This unification has resulted from a series of "big science" projects here and in Europe.

CREASE: Also, I think the image that great discoveries are still possible with tabletop experiments is misleading. Big science produces a body of knowledge that's slowly advancing, and often discoveries that seem small are based on that body of knowledge produced by big science. For instance, much of the work on superconductivity that's been done in the past three years has been done in small experiments but has been based on knowledge gained at reactors.

SCHAFER: That is old wisdom. Science always builds upon previous work. Everybody is little; each scientist steps on the shoulders of the people who came before, and sees a little bit more.

But somehow I think one would expect a link between the amount of funds available for scientific research and the output in laws of nature.

Another thing I'm wondering is: can big science grow, and continue to grow, or has it reached its limit? Could the saturation be twofold: it can't grow more in terms of money and people, and it reaches a point of diminishing returns? You don't get bigger and bigger results leading people to ask why can't we do better with less.

GRANNIS: I can't imagine that the number of people or the amount of support will grow drastically.

But things work in funny ways. You go along and all of a sudden there's some collection of major new advances—usually because of some technology—which make it possible to do things a great deal more simply, compactly and efficiently. Things can then develop quite rapidly due to the smaller size, until expansion again begins to set limits. For example, at the moment people are building telescopes in space whose size is probably about as large as could be imagined.

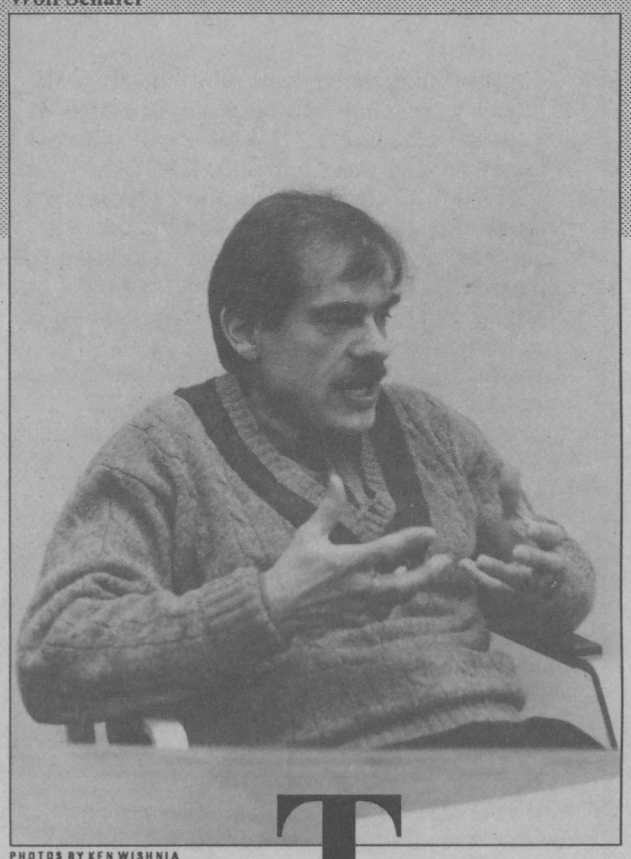
SCHAFER: So you know you need a smarter telescope.

GRANNIS: Yes. You can't really predict when that idea is going to come. Although historically, those ideas come along with sufficient frequency that they enable you to make that wonderful compaction.

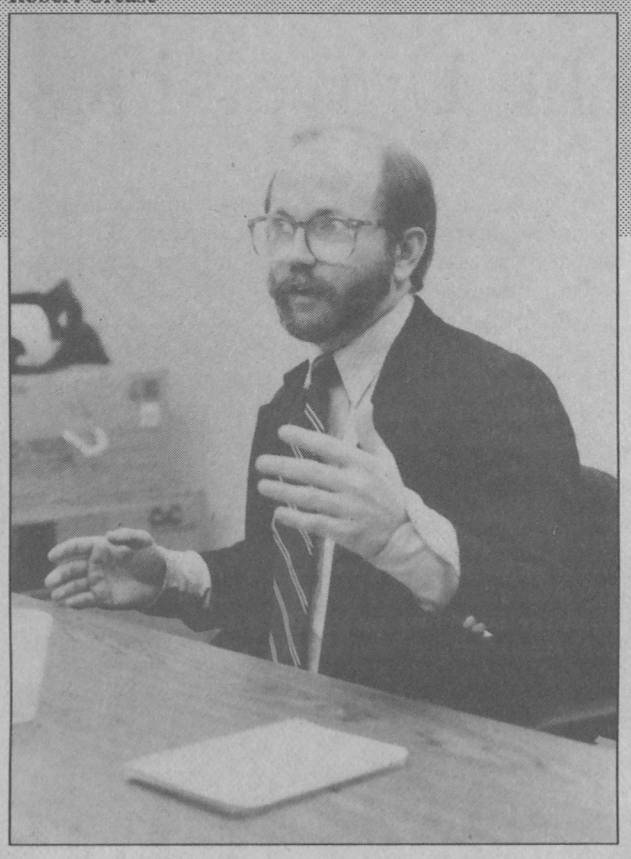
CREASE: The history of accelerators is a perfect example of that. Accelerators are built bigger and bigger on the same principle, until a limit is reached. But then a new principle comes along, and suddenly you can build more powerful smaller ones, and the process keeps repeating itself.

I'd like to know if physics is the vanguard of the

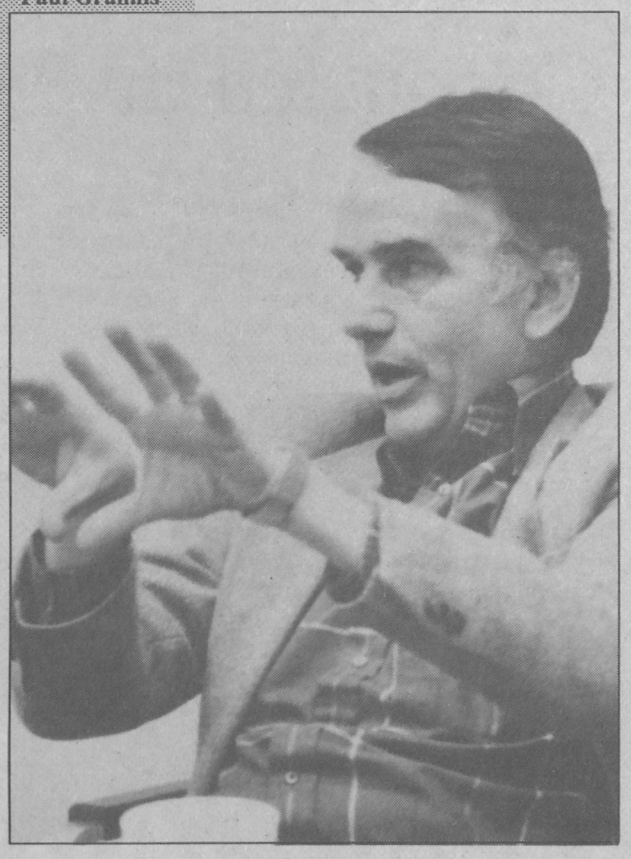
Wolf Schafer



Robert Crease



Paul Grannis



PHOTOS BY KEN WISHNIA

The Changing Role of the Researcher

sciences, in terms of big science? Is it just because physics requires particularly big instruments? Or is this trend going to be followed by the other sciences?

GRANNIS: I don't think there's anything that makes physics special in this regard. In fact, I would suppose that astronomy is the leader in the impulse toward big things. The 200-inch telescope was built back in the 1930s.

In biology nowadays people want to study biological specimens or reactions as they happen in real time, or very short time scales. And they find that the way to do it is to go off to your friendly neighborhood accelerator to find the right probe to look at these things. And bingo, the project is big.

SCHAFER: Would you be happy with the phrase "technoscience"?

GRANNIS: I would be very unhappy with that phrase. I wouldn't know what you were talking about.

SCHAFER: Isn't it true that big science is linked to the development of machines? I see a marriage of technology and science in this century, and even in the last one. Now we probe the atom, but we need very quick computational devices, so we create supercomputers.

You have a basic question concerning the elementary structure of matter and you build faster and faster computers. The development of the machine is linked to the development of the theory.

GRANNIS: Science does use increasingly sophisticated tools. One has to master the tools to do the experiments.

There are some people who become seduced by the tools and go off into the exploration of the technology. But I think there really does remain in people's minds the fundamental attitude scientists had 200 years ago, which is a completely apractical consideration of wanting to explore a particular question. I don't think that's changed.

The same things happen in theoretical science. It advances in its own way, and people find new tools in funny kinds of mathematics. Some go off in that direction but for the mainstream it remains a tool.

SCHAFER: The machinery is no longer just a tool. It develops with the theory. Our understanding should be that these two elements have come together.

CREASE: Why shouldn't that be true of any field, that the particular requirements of the field—whether it be manufacturing or basic research—apply the adaptation and creation of special tools that wouldn't necessarily be used outside of that field?

GRANNIS: I think you're absolutely right. In any enterprise, development of tools is an exercise that is every bit as credible and rewarding as the more basic side. But I think there is a fundamental distinction in attitude between people in each one of those areas.

SCHAFER: That brings us to the division of labor in big science. What about big science and ethics? Big science, little ethics or big science and no ethical problem? On big science projects people work in many different teams.

You could be working on object recognition, say, through the eye of the bald eagle. What the individual scientist in the eagle team does is interesting and ethically okay. But what if it is part of a bigger project designed to build, let's say, intelligent missiles that can recognize the surface of the earth? How can you function ethically if you don't control the end product?

GRANNIS: The question you're raising applies to science as a whole, not just big projects. The individual researcher is no more capable of controlling the possible final use of information generated than an investigator does in a large project. Once it enters the mainstream of scientific understanding it will be used by whomever and in whatever way.

SCHAFER: But in little science, you produce the final product.

GRANNIS: I don't think there is ever a "final" product. Things always get used in unforeseen ways. For example, those who made the first biochemical studies of proteins probably did not foresee the possibilities and ethical problems of genetic engineering. J. J. Thomson and Ernest Rutherford's studies of atomic structure led in the end to nuclear weapons and energy, although Rutherford wrote that these applications were "moonshine." In goal-oriented projects like the Manhattan Project it is easier for individuals to foresee where the ethical questions would arise.

SCHAFER: Maybe some people on that project could sleep better thinking not of the larger project but of their own individual work. That's linked to our traditional ethics, feeling responsible for and defending only what we do.

GRANNIS: For a generation after the Manhattan project, physicists felt a collective guilt.

CREASE: Beyond big science, can you distinguish another level, which is multinational science? The more foreign institutions you have, the more these big collaborations function like multinational corporations. There's one collaboration at CERN (*Centre Researche Nucleare European*) that involves nations that do not recognize each other. But such a collaboration forces communication beyond political constraints. Multinational science has a social impact.

SCHAFER: Must big science be linked to big countries? You don't have much big science in third world countries.

GRANNIS: In our case we had a group from Brazil that barely has enough money to send people to this country, but they make contributions by virtue of their own talents.

CREASE: When it comes to technology on a project, you need the cheapest, high-quality equipment possible. Often it's found in third world countries. CERN has high-technology parts made in India and Pakistan. As a consequence, there's a lot of technology transfer with these small countries. Their scientists participate and get educated in ways they wouldn't have been before these big collaborations got established.

How have things changed for young people entering science? Some would say the state of science now is vastly different than it was 50 years ago.

GRANNIS: Yes, and my father used to talk with great nostalgia about the horse and buggy days! Science, like much else, changes.

CREASE: The skills you have to have to be a scientist have changed. The differing skills might mean that students who would have been interested in entering science 50 years ago wouldn't be now.

GRANNIS: In basic scientific research, one very often finds that new skills are needed to make progress. I know that physicists have a kind of boldness which makes them think that they can learn any new set of skills when required. If glass blowing, computers, electronics or the theory of multidimensional manifolds are required they pitch in headlong to learn that. The feeling is inculcated into each new generation that you must master the trades that are necessary for the job at hand.

The Animal Rights Challenge

Litigation Threatens Research Conducted at Public Universities

By Dan Forbush

The mechanism by which universities review and approve research involving the use of animals has become a legal battleground. At stake is the ability of public universities to compete in the research arena on an even footing with private institutions.

In at least a dozen states, including New York, animal rights organizations have sued to force public universities to turn over copies of research applications and to allow animal rights activists to attend meetings of animal care committees at which such applications are reviewed.

Investigators are alarmed that this legal offensive is taking place at the same time animal rights militants are undertaking an escalating campaign of violence against institutions where animal research is conducted. Containing names of investigators, phone numbers and room numbers, research applications provide a wealth of information for anyone determined to harass investigators or plan a break-in.

Investigators also fear that allowing animal rights activists access to meetings and research applications will enable them to disrupt the approval process. This, warns President John Marburger, would have a particular impact in the competitive field of molecular biology where even a short delay can make the difference between being the first to report a particular finding or being an 'also ran.'

"Subjecting our faculty even to the threat of such disruptions would put them at a competitive disadvantage with respect to their colleagues at private universities," Marburger says. "It would jeopardize our ability to hire and retain the most talented and productive faculty. It would also put our developing biotechnology industry at a considerable disadvantage with respect to other states that have taken a stronger stand against animal rights advocates."

In a suit brought against the university by the ASPCA and Bide-a-Wee Home Association, a judge in the Supreme Court of Suffolk County ruled last April that Stony Brook's animal care committee is a public body as defined by the state's Open Meetings Law, and must therefore open its meetings to the public. SUNY has initiated an appeal and a ruling is expected by summer.

The ASPCA and Bide-a-Wee Home also have sued Stony Brook under the state's Freedom of Information Law (FOIL), which covers public records. Although the university last summer turned over copies of 700 applications funded during a three-year period, the organizations claim that deletions of procedures and identifying information such as names, phone numbers and room numbers were improper. The university contends the deletions were necessary to ensure compliance with the Animal Welfare Act, which prohibits release of information relating to "trade secrets, processes, operations [and] style of work or apparatus."

"Subjecting our faculty even to the threat of such disruptions would put them at a competitive disadvantage with respect to their colleagues at private universities."

Sued by an animal rights organization in a similar public records case, the University of North Carolina presented essentially the same arguments and came away in December with a resounding victory. Research applications, the judge in that case found, contain potentially valuable business or technical information which constitutes "trade secrets" as defined by North Carolina law. Moreover, the judge ruled that "public policy considerations alone serve as a basis for preserving the confidentiality" of such information, and added that the qualified privilege of academic freedom guaranteed by the First Amendment protects research applications from any requirement of public disclosure.

SUNY officials hope the judgement in the FOIL case—expected to be handed down this spring—will be equally favorable. But having no assurance that the courts will provide such protection, they are working with the governor's office and with legislators to develop a bill to exempt university animal care committees from the requirements of the state's Open Meetings and Freedom of Information laws.

Passage of such a bill is "extremely important," says Jordan J. Cohen, dean of the School of Medicine, because "it would ensure that public and private universities—which conduct the same kinds of biomedical research using virtually the same mix of federal and private funding sources—would continue to carry out research on equal terms."

"The faculty most likely to decline recruitment offers or to leave the SUNY system because of the intrusions of animal activists are precisely those who are most promising and accomplished," he continues. "Students at the State University of New York deserve access to faculty of the same quality as do their colleagues at private universities, especially in the burgeoning medical sciences."

Dan Forbush is associate vice president for university affairs.

Going 'Proactive': A Communications Initiative

Recognizing the increasing militancy of animal rights activists, Stony Brook investigators are joining their colleagues around the country in taking a more active role in communicating the benefits of animal research to the public.

A recently created Biomedical Research and Communications Committee (BRCC) has brought to the campus government officials and representatives of voluntary health organizations for briefings on Stony Brook's animal-based research and tours of animal facilities. A speakers bureau for community and civic groups is being formed, and Stony Brook scientists are going into area schools to explain to elementary and high school students the importance of animal research to medical progress.

In addition, Stony Brook scientests are making a special effort to ensure that members of the news media are informed of the facts regarding the university's use of animals in research. Reporters covering the FOIL and Open Meeting suits, for example, have been offered tours of the university's animal facilities along with in-depth briefings.

At the system level, Chancellor Bruce D. Johnstone has appointed faculty from a number of campuses to develop a SUNY-wide strategy. Representing Stony Brook are Lorne Mendell, chairman of the Department of Neurobiology and Behavior, and Charles Middleton, director of the Division of Laboratory Animals.

"We now recognize we're in a real fight and that we have to go out and tell people the truth about the importance of biomedical research and how it's done," says Mendell, who chairs the Stony Brook committee. "One thing's for certain: It can't be done without animals." —Wendy Greenfield

The Review Process

Responsibility for implementing federal and state regulations regarding use of animals both for research and teaching rests with the Institutional Animal Care and Use Committee (IACUC).

Chaired by Craig Evinger, associate professor of neurobiology and behavior, the committee reviews all proposals for using vertebrate animals in research and teaching. Twice a year, the committee also inspects all facilities on the campus where animals are used in research activities.

Members of the committee consider themselves to be animal welfare activists, Evinger notes. "Our goal is to ensure the humane treatment of animals used in improving health care and in training the health care professionals of the future."

Comprising the committee are a veterinarian whose specialty is laboratory animal medicine, five active scientists with diverse research interests, a representative from the Institutional Assurances office, a nonscientific member of the Stony Brook staff who is not working with animals, and a member of the public not connected with the university. This diversity of perspectives is mandated by federal regulations.

Investigators wishing to conduct a scientific study involving animals begins by presenting a proposal for this research to the IACUC. This detailed proposal outlines specific goals of the study, details of the experimental procedure, and a description of how pain or stress to the animal will be prevented or minimized. (Ninety-four percent of all animals used in research at Stony Brook last year were rodents).

Since the details of the proposed experiments represent the original ideas of the scientist, federal regulations require the committee to keep such information confidential. At the same time, the presence of a community member and nonscientists on the committee gives the public an active voice regarding animal welfare.

Each proposal submitted to the committee is read by all members and then discussed in committee meetings. If any member of the commitee finds a problem with the proposal, it is sent back to the investigator for modification. Only when the entire commitee finds the proposal acceptable is the investigator authorized to obtain the necessary animals through the Division of Laboratory Animals.

The university prohibits any use of animals by faculty or students that has not received IACUC approval. "While cumbersome," says Evinger, "the proposal review process and the laboratory inspections enable the university to follow the extensive state and federal guidelines concerning animal use and, more importantly, ensure humane treatment of animals at Stony Brook." — D.F.

The Simple Truth: Animal Research Saves Lives

By Jordan J. Cohen

When questions are raised about the appropriateness of conducting experiments on animals to further our understanding of human disease, those of us actively involved in biomedical research tend to react with amazement and disbelief. Most of the glorious achievements of biomedical research—achievements that offer a vastly improved quality of life for everyone on earth—simply could not have occurred without the availability of animals as research subjects.

Opposition to animal research stems from two quite different sources. The rational opposition comes from a concern about animal welfare. The irrational opposition derives from a misguided belief in animal "rights."

Animal Welfare Concerns

Concern about animal welfare has been articulated most effectively by a movement that can be traced back at least to the early nineteenth century. This concern was well founded because examples of animal cruelty were at times evident in some laboratories.

The animal welfare movement deserves credit for having heightened public and professional awareness to this problem and for spearheading enactment of current laws and regulations that have now provided abundant safeguards against all varieties of animal misuse or abuse in the biomedical laboratory setting.

Today, in order to accept federal funds, which are indispensable for virtually all institutions engaged in biomedical or behavioral research, such institutions must adhere to rigorous standards for animal care. These standards are embodied in *The Guide for the Care and Use of Laboratory Animals* developed for the National Institutes of Health by the Institute for Laboratory Animal Resources, an arm of the National Research Council. The guide, which is under continuous review, governs all aspects of animal experimentation including procurement, caging, feeding, sanitation, exercise, anesthesia, analgesia, euthanasia and disposal.

All responsible investigators—as all responsible citizens—embrace the principle of humane treatment of laboratory animals and raise no quarrel whatsoever with those interested in maintaining reasonable guidelines. Animal welfare is a central concern in all research facilities and current laboratory practices are held to a very high standard by effective government regulation.

Jordan J. Cohen is dean of the School of Medicine. This article is adapted from an article that appeared in SUNY Research.

> *"Most of the glorious achievements of biomedical research simply could not have occurred without the availability of animals as research subjects."*

Animal Rights Issues

Let me turn now to a consideration of the animal rights movement, which is of much more recent vintage. Assertions by advocates of this novel belief system have very troublesome implications.

The central thrust energizing the animal rights movement is a fundamental belief that animals, no less than human beings, have rights precluding on moral grounds any use by humankind. Whereas some animal welfare advocates called for curtailment of certain kinds of research as a tactic to minimize cruelty, animal rights activists justify their efforts to abolish all animal experimentation as a matter of principle. And, some animal rights activists are prepared to employ virtually any means, including unlawful and even violent acts, to achieve their ends.

Strides in Human Health

Why do we use animals in biomedical and behavioral research? Let's recall a few examples of how biomedical research has contributed to human welfare in the span of just the last few decades.

• Life expectancy has increased by approximately 25 years in the United States since 1900. Although widespread application of public health measures is a major factor in this dramatic statistic, much credit also goes to greatly improved diagnostic and therapeutic measures made possible by animal experimentation.

• *Poliomyelitis*, once a fearsome threat to human health, has ceased to be a major worry. The safe and effective vaccines in use today are traceable directly to animal research and simply could not have been developed without such efforts.

• Organ transplantation now offers a vastly improved duration and quality of life to tens of thousands every year and prospects are for even more dramatic benefits. The accumulated knowledge required to perform safe and effective transplantation would have been unobtainable without animal experimentation.

• Open heart surgery, implantation of orthopedic prostheses, removal of brain tumors, reattachment of limbs, repair of genetic malformations, and countless other routine surgical "miracles" performed every day, were all made uniquely possible through animal experimentation.

• Development of the drugs for treating pain, cancer, high blood pressure, heart disease, pneumonia, kidney infections, malaria, infertility, asthma, peptic ulcers—the list is endless—all required animal experimentation.

To quote from an article by Carl Cohen in *The New England Journal of Medicine*, "Every disease eliminated, every vaccine developed, every method of pain relief devised, every surgical procedure invented, every prosthetic device implanted—indeed, virtually every modern medical therapy is due, in part or in whole, to experimentation using animals." The prospects for dramatic further improvements in early diagnosis and effective therapy stemming from revolutionary advances in molecular genetics, cell biology, neurobiology, virology, microbiology, pharmacology, biophysics, toxicology . . . are real and, in virtually every instance, require—absolutely require—the use of animals.

A Proper Perspective for the Future

Like all forms of anti-intellectualism, opposition to appropriate animal experimentation rests on misperceptions, partial truths, misinformation, and ignorance. Unhappily, opposition to the legitimate use of animals in research is mounting and must be taken quite seriously. The temptation to scoff at such views, to laugh them off as the harmless musings of benighted but powerless fringe elements, is to risk the dismantling of a precious resource for the future health and welfare of society.

The threat is real. The opposition is cunning and well-funded, and its purpose is clear—abandon the use of all animals in research of any kind. Our best hope for thwarting this misguided attempt is an enlightened and aroused public. It is time to speak up.

At the Forefront of Medical Advances

Stony Brook investigators using animal models are working at the forefront of their fields to solve many of medicine's most intractable challenges. Among them:

• **Stroke.** Investigators using rats are exploring the chemistry of stroke, particularly the manner in which acids increase brain injury. This avenue of research might lead to a drug that can stop or inhibit a stroke while in progress.

• **Arteriosclerosis.** Investigators are testing the effectiveness of monoclonal antibodies produced in mice to prevent clogging of blood vessels. Related work aims at the ultimate manufacture of artificial blood platelets, an advance that would reduce significantly the current risk of transmitting hepatitis and AIDS through blood transfusions.

• **Cancer.** Investigators using rats are studying the basic cellular and molecular processes involved in cell differentiation and production of tumors. Future applications may assist in understanding the molecular mechanisms of tumor production, as well neuronal response to such injuries as stroke, hypoxemia and hypoglycemia.

• **Diabetes.** Investigators using rats are studying synthesis of specific neurotransmitters with the aim of better understanding how the brain regulates its chemical signals to influence behavior. The project may lead to better treatments for diabetes, epilepsy and obesity.

• **Alzheimer's.** Investigators using rats are studying the causes of abnormal growth in the brain as seen in tumors and degenerative diseases. Among the potential results: new treatments for Alzheimer's disease and brain tumors, as well as a means to prevent complications from diabetes.

• **Schizophrenia.** Using human subjects and rats, investigators are studying the role of serotonin, a chemical which transmits information in the brain, in a variety of human behaviors and diseases. Their goal: to develop drugs to correct abnormal brain development in such disorders as schizophrenia, autism and Down's Syndrome.

• **Spinal Cord Injury.** Using electron probe x-ray microanalysis in rats, investigators aim to discover how nerves are damaged by chemicals in the environment, by trauma and by inherited and acquired metabolic disorders. Such work may ultimately lead to development of drugs for use in treating spinal cord injury. Investigators are also using rats to study the organization of spinal neurons—work they hope will lead to a means to restore normal urinary and sexual function to spinal cord injury patients.

• **AIDS.** Using mice and hamsters, investigators are studying ways in which diseases caused by microbes (bacteria, viruses and protozoa) are contained in humans, with a focus on how cells deal with infectious agents. Better treatments for AIDS and a variety of infections associated with AIDS are potential results. (No animals at Stony Brook are infected with the HIV virus.)

• **Burns.** Performing skin grafts on mice, investigators are exploring a broad range of questions that could potentially lead to new treatments for burns and chronic skin ulcers and a variety of genetic skin defects. The research aims to determine whether skin cells produce chemicals that go beyond the skin to deeper tissues, even to distant sites.

• **Glaucoma.** Investigators using dogs are studying the efficacy of a new shunt device designed to treat glaucoma by lowering intraocular pressure. Another team is exploring the use of new medications for use after glaucoma surgery to promote proper healing. Surgery for glaucoma fails in almost one-third of all patients, who consequently go blind.

PAT COLOMBARO

Physicist Harold Metcalf (third from left) chills and slows atoms with his team, from left, graduate student Song-quan Shang, postdoctoral fellow Peter Van der Straten and graduate student Brian Sheehy.

Creating the Coldest Temperatures

By Sue Risoli

This winter's record cold snaps didn't bother Harold Metcalf. In fact, the Stony Brook physicist knows what real cold is—and he's set a few chilly records himself.

Metcalf and his research team use light beams to cool atoms. Cooling slows the atoms down, which makes it possible to create a well-defined, sharply focused atomic beam. Sharper, slower beams increase the accuracy and precision of computers, navigation equipment and other machinery that depend on atomic clocks.

So far, the scientists have cooled the atoms to a few millionths of a degree above absolute zero (otherwise known as 273.16 below zero Centigrade). Just how cold is that? "It's millions of times colder than arctic temperatures, cold enough to freeze everything," says Metcalf. It's also the coldest temperature ever recorded.

At that temperature, atoms move only a few centimeters per second, the slowest speed ever achieved. "It's about as fast as you'd move your hand when you're writing your name," Metcalf says. Atoms typically move at speeds 500 meters per second. The combination of colder and slower means that "we no longer have to sacrifice size or intensity in atomic beams.

"In the past, scientists had to settle for a small, focused beam, but it was weak, like a flashlight shining through a pinhole. Now we're making beams that are strong as well as sharply focused."

The results make possible improvements in high-precision equipment. "Without refinement of atomic beams, we'd have 1950s technology," says Metcalf. His experiments also move basic research a step further. "Anyone who studies the interaction of atoms with each other and with materials can now use these sharper beams as a tool," he notes.

Making the beams, Metcalf says, is "a complicated business. We know that light exerts force," he explains. "But you don't just shine light on something and slow it down. We move the atoms in a vacuum in a straight line going in one direction and slow them down with a light beam heading toward them in another direction. You have to do it just right or the experiment won't work."

Though the team (Metcalf, postdoctoral fellow Peter van der Straten and graduate students Brian Sheehy and Song-quan Shang) have broken all records for slow, cold atoms, the scientists can't explain their success. "Everyone else working in this field has newer, fancier, more expensive equipment," Metcalf says, puzzled.

The key may lie in Stony Brook's homegrown approach. "We improvise, patch things together and build many of the instruments ourselves," Metcalf says. "When you do that you learn a lot about the equipment you're working with, and you take chances that way, which you might not do with more expensive equipment. We'll just keep on going to see how much colder, slower and sharper we can get."

For Linguists, English Weaves a Tapestry of Multicultural Threads

By Gila Reinstein

Kamal Sridhar and her husband, Shikaripur N. Sridhar, study languages—English languages, along with many others. To this couple, English is a fascinating, powerful family of languages, not one monolithic tongue. English varies with the speaker and his or her place of origin and native language, they contend.

"The majority of interactions in English are between non-native speakers, such as a Japanese businessman selling a Toyota to a Colombian," says S.N. Sridhar, who has taught at Stony Brook for the past 10 years and is now director of undergraduate studies for the Department of Linguistics. English is spoken by about 350 million native English speakers and about 400 million nonnative speakers, he says. Wherever it is spoken, "English is modified to reflect the speaker's own cultural values."

Psycholinguists study the subtle social, cultural and pragmatic differences in how a language is used, and the Sridhars are on the forefront of this research. S.N. Sridhar's *Cognition and Sentence Production* (published by Springer Verlag, 1988) examined the psychological and situational processes which generate sentences. The book was based on a study using 10 different languages, including Japanese, Turkish, Finnish, and Hebrew.

In countries such as India, where 400 different languages are spoken, and in other multilingual areas such as the Philippines, Singapore and Ghana, "English has taken on a life of its own. It forges internal social bonds and reflects the indigenous culture," he continues. As the one language shared by people across many cultures within a country, English fulfills a useful function, but it goes beyond the pragmatic. Nonnative speakers use English in distinctive ways, reflecting their own cultural patterns.

Sometimes the study of psycholinguistics involves close knowledge of social customs. For example, in India, the etiquette for requesting something is different than in the United States. In this country, a thirsty guest would say, "May I please have a glass of water?" In India, the correct form would be, "Please, get me a glass of water." To American ears, that sounds brusque and demanding, but to Indians it is proper and polite.

Bilingualism is central to the Sridhars' research. Kamal Sridhar is director of the English as a Second Language (ESL) program at Stony Brook, where she has taught for the past three years. She has close contact with foreign students who are absorbing a new language along with their field of study. She trains teachers to work with ESL students, and she and her husband study the special language patterns of bilingual speakers of English.

In their study of bilingualism, the Sridhars research how languages are acquired, processed and stored in the mind. Bilingual speakers tend to combine two languages within one sentence, using techniques called "code mixing" and "code switching." This speech behavior was once thought to be a sign of inadequate mastery of either language, says S.N. Sridhar, but their recent research has determined that this is not so.

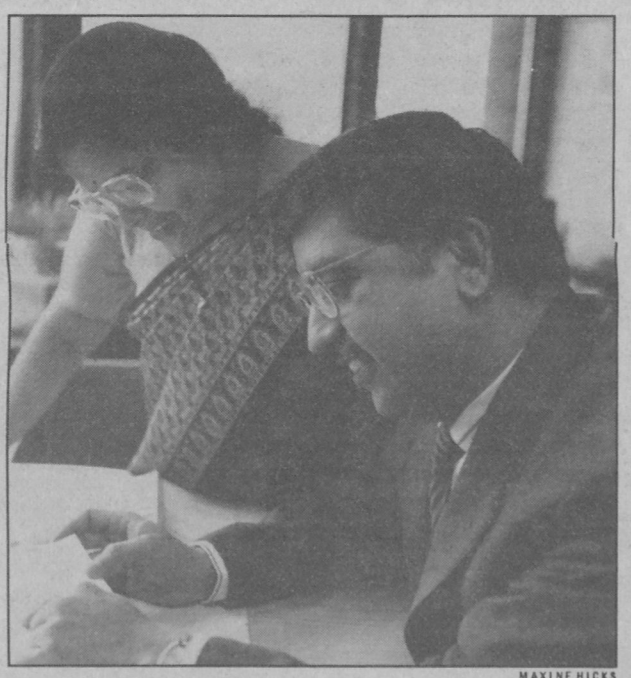
Frank Anshen, chair of the Department of Linguistics, calls the Sridhars' research in code mixing and code switching "basic work in the field. No one would publish in this area without reference to their work. They looked at a great deal of data and what the data showed" and their results forced the scholarly world to revise some key concepts about bilingualism, Anshen said.

The Sridhars have discovered that bilingual speakers use a complex but predictable system, regardless of which languages are being combined. "Grammars blend without violating either system," he says. "There are regular rules and patterns. Bilinguals accept certain kinds of mixings and reject others."

To illuminate these linguistic rules, the Sridhars study models of mental functioning. "In the 1960s it was believed that languages were kept separate within the brain," S.N. Sridhar explains. That is no longer the accepted theory. Now, the integration of two languages is believed to occur through what linguists call "assembly line" methods, in which chunks of different languages are brought together. This is the model for which the Sridhars have become widely recognized in their field.

As part of the study of bilingualism, the Sridhars research language maintenance. Currently they are investigating how various Asian communities retain or abandon their native languages as they adjust to life in the United States. Kamal Sridhar began her preparation for this work when she won a National Endowment for the Humanities grant in 1984 to study with Professor Joshua Fishman at Stanford University. Fishman was working on language retention patterns within Spanish-speaking and Yiddish-speaking communities, and he invited her to expand the research into Asian languages.

The Sridhars also study language modernization.



MAXINE HICKS

Kamal and Shikaripur N. Sridhar

When ancient spoken languages are brought into contact with the modern world and "new vocabularies, new discourse patterns and styles have to be created," says Kamal Sridhar. "Some must start by acquiring alphabets."

Modernizing a language presents "a complex tangle of problems—social, political, human rights," says S.N. Sridhar. "It is a human right to be allowed to speak your native language," but the modern world must also contend with what he called "efficiency of communication."

Communication within and across cultures often requires reading and writing. Illiteracy is a serious handicap in the modern world, one that concerns the Sridhars. During the first week of March, Kamal Sridhar participated in a United Nations conference in Jomtien, Thailand, to study the problem of worldwide illiteracy among women. The conference, sponsored by UNICEF and the World Bank, brought officials together to confront the problem and consider solutions.

In terms of illiteracy, "India is not particularly bad," Kamal Sridhar says. The worst countries are the Sudan, Mali, Bangladesh, poor countries where "the literacy rate is near zero percent. Attitudinal studies show that even in a wealthy country like Kuwait, for example, illiteracy among women is high because men don't like the idea of women leaving the home to learn."

But Kamal Sridhar leaves home to learn—and to teach. She and her husband stand on the forefront of linguistic research, with a rigorous academic bias and a strong social conscience.

Gila Reinstein is a senior writer in the Office of News Services.

Aldona Jonaitis

Aldona Jonaitis '69:
Living a Childhood Fantasy

Every child has a fantasy but not every fantasy comes true. It has for Aldona Jonaitis '69.

As a young girl growing up in Manhattan, Jonaitis spent every spare moment at the American Museum of Natural History. Spellbound by the artworks featured in North American Indian displays, she dreamed of one day becoming an explorer who could travel to distant reservations to see them firsthand.

Today, Jonaitis is a well respected art historian, author and anthropologist who specializes in northwest coast Indian art. Her beloved museum has named her to a vice presidency created especially for her. Charged with redesigning displays, she travels to Indian homelands to consult with tribal elders. Better still, she invites them to Manhattan to see the museum for themselves.

Sound like the stuff screenplays are made of? Fortunately for Jonaitis, it's all real. After serving as Stony Brook's vice provost for undergraduate studies for two years, she left the university last fall to assume the newly created post of vice president for public programs at the American Museum of Natural History. Along the way she received a bachelor's degree in art history from Stony Brook in 1969 and served as lecturer and chair in Stony Brook's Department of Art. She also holds master's and doctoral degrees from Columbia University in art history and archaeology.

Jonaitis is responsible for the museum's education and exhibition departments and for its planetarium. "It's all of the programs that interface directly with the public at large," she explains. She calls her position "a fantasy job come true."

"The American Museum of Natural History is one of the most important natural history museums in the world," she says. "There are very few others that even approach it in size and significance, scientifically and in terms of public displays. It also has the finest collection of northwest coast Indian art in the world, and that's the material I study."

But even with the museum's tremendous potential, she claims, there's work to be done. "The museum is not as innovative or forward-looking as it might be in terms of displays," Jonaitis explains. "It used to be that when you had an ethnic graphic display, such as 'peoples of Africa' or 'peoples of the northwest coast', you'd show a group of masks and figures and people sort of living in huts. Visitors to the museum would say, 'Oh, how interesting,' but there'd be a sense that those displays represented a culture that has disappeared."

These cultures are very much alive, Jonaitis reports, and she wants the musuem's displays to reflect their vitality. Toward that end, she's begun working with the Indians themselves on forthcoming exhibits. "I go to them and say, 'What would you like the story line to be? Then I interview them and we work on a story line together." She's met with a group of Nuu-Chach-Nulth Indians at the musuem, and is getting ready to host a delegation of Kwakkiutl Indians this spring. "For some, it'll be the first time they've left their British Columbian homeland," she notes. "It'll be the first time they've ever been invited to the museum to participate in the planning of an exhibit."

How do they react to the invitation? "They're delighted," Jonaitis says. "They're excited that people are going to see them as a thriving, active culture, and they're happy that people want to hear what they have to say."

Though Indian reservations may seem a long way from Stony Brook, for Jonaitis it's been a natural progression. "As a child I was very intrigued by canoes and totem poles, and the art just struck me as wonderful. Then I got to graduate school and made the most remarkable discovery: I can specialize in this material!"

As a faculty member and administrator at Stony Brook, Jonaitis became increasingly involved in issues of education and public outreach. Being at the musuem, she says, "ties everything together."

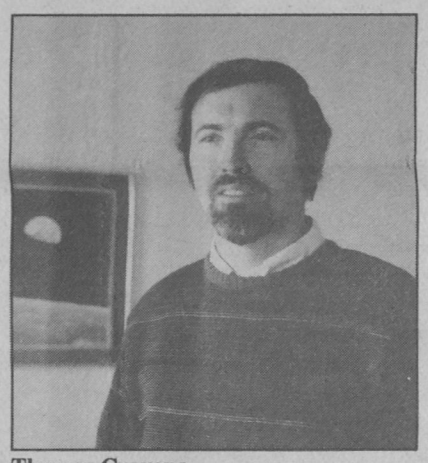
She's now working on a book on the Nuu-Chach-Nulth, having written several others on northwest coast Indians, the most recent being *Art of the Northern Tlingit*, published in 1986. Though she revels in her research and her new job, she confesses a nostalgia for Stony Brook.

"I was there for so long that it was more 'me' than anything else in my life," Jonaitis recalls. "And I miss the contacts with students and staff."

She plans to return to campus occasionally with husband Gene Lebovics, a faculty member in the Department of History. But there are other ties as well.

"I'm an alumna of the university and I'll never really leave it," Jonaitis says. "I'll always be connected to Stony Brook. And that makes me feel very good."

Thomas Cravens '70:
Mysteries of the Universe



Thomas Cravens

As a child, Thomas Cravens got his first taste of science by learning about the weather. His father, a weather forecaster for the National Weather Service at Kennedy International Airport, used to bring home old weather maps, which the family would reuse as coloring books.

Today Cravens, an associate professor in the Department of Physics and Astronomy at the University of Kansas, is considered by many an expert in solar system research, specifically in the fields of aeronomy (the study of the upper atmosphere) and space plasma physics (the study of charged particle gases).

According to Cravens, 99 percent of the universe is made up of plasma—charged particle gases that make up the sun, the medium between the stars and the planets and the upper atmosphere of the earth. Space plasma affects phenomena such as star formation and supernovas. Cravens is studying plasma in the solar system to better understand plasma processes throughout our galaxy.

"If we understand space plasma in our own neighborhood, then we may gain insight into plasma processes elsewhere in the galaxy and the universe," he says.

Cravens' research may someday offer clues to the mystery of the universe and answer such age old questions as: How did our solar system form? Why do we have a solar system? And, finally, why are we here?

But there are also practical reasons for studying plasmas. Upper atmosphere plasmas affect radio communications, and can cause interference in a short-wave signal from one country to another.

Plasma effects associated with geomagnetic storms have been known to disrupt power grids. Last year, the province of Quebec lost power because of a solar flare. Geomagnetic storms can also induce currents in pipelines, which results in corrosion. Astronauts must also be wary of space plasmas found in the earth's radiation belt and produced by solar flares.

In recognition of his international achievements, Cravens received Stony Brook's "Distinguished Alumnus Award" last fall.

Maureen Duggan '86:
The Nightmare of Alcoholism

Maureen Duggan

Maureen Duggan knows the nightmare of alcoholism. At age 30, Duggan was happily married with three children, ages 10, 11 and 12, and active in the community when her alcoholism began. A year and a half later, she was divorced, declared an "unfit" mother and lost custody of her children.

Having hit bottom, Duggan sought help and rebuilt her life. She dedicated herself to understanding alcoholism, especially how it affects children. She became an alcoholism counselor and then assistant director for the Town of Huntington's Alcoholism and Drug Abuse Program. In 1980, she became regional director of the New York State Employee Assistance Program. Today, she is deputy commissioner of the Suffolk County Department of Alcohol and Substance abuse Services.

In 1984, she enrolled in the master's program in Stony Brook's School of Social Welfare. Little did she know that would be a turning point in her life. What started out as a class project for the course, "Children of Alcoholics," later turned into a children's book. *Mommy Doesn't Live Here Anymore*, published in 1987, is a true story about Duggan's alcoholism and how it affected her children's lives told through the eyes of Duggan's daughter, Linda Ellyn.

"In asking my daughter to read the manuscript, I told her she's going to feel all the hate, the rejection and abandonment she felt as a child," Duggan recalls. "She said she would help me with the book if I promised it would help children of alcoholics."

Duggan describes the next six weeks as wrenching. "I have a high ranch house," she says. "Her room is downstairs. I sat on the top step listening to my daughter sob and get angry."

Duggan decided to tell the story from her daughter's point of view because she was the one who assumed her mother's responsibility for the family. "She was the one who had to come home, do the laundry, clean the house, make dinner. She could no longer do the things your average 12 year old was doing."

The book became a success. "The first 1,000 copies sold so quickly we didn't know what hit us," Duggan says.

About 1,800 copies of the book were sold to schools, libraries, employee assistance programs and high-risk alcohol and drug abuse programs across the nation. Proceeds from the book went to the Foundation for Children of Alcoholics.

Duggan is at work on a second book for children of substance abusers. She's remarried and her children have grown up.

"Children of alcoholics need therapy whether or not the parent stops drinking," she says. "They need to find out it isn't their fault. The book tells them that."

Michele Bogart

PAT COLOMBRARO

Bogart: What Is Art?

By her own admission, the type of art Michele Bogart studies is "marginal." At least, she says, that's how a lot of art historians would consider these works.

Bogart, an assistant professor of art, is examining the relationship between commercial art and "fine" art in America from 1890 to 1950. "It's a social history," she explains, "rather than just a purely stylistic or iconographic one."

Why that particular time period? "I'm starting with the rise of print media and national advertising and I'm cutting it off at the beginning of television. TV brings up a whole different range of questions about the relationship of art and mass media," she explains.

During pre-television years, says Bogart, boundaries between fine and commercial art sometimes blurred. "Georgia O'Keefe did an ad for Dole pineapple. Container Corporation of America commissioned William deKooning to do a painting for an ad." But by the 1950s, "the boundaries were very clear cut between the two," she continues. "We tend to think of fine and commercial art as being mutually exclusive. I'm interested in the actual practices of artists—how they did their work and what they thought about it—and how that defined them."

Bogart is also examining how the use of photos in advertising changed perceptions of photography as art. "It's not simply a matter of representational preferences," she notes, "but a result of the fact that photographers as a group convinced advertisers to use their work."

What's art today? "I'm not sure yet," she confesses. "When Andy Warhol—who started as a commercial designer—came along, he brought the whole issue around full circle by incorporating images from ads and comics into his work.

"At this point in my research, I can say this," she muses. "The relationship between commercial art and fine art has been shifting constantly since the turn of the century. Any notion of what fine art is has to be undertaken in relation to the way commercial art is defined."

Peterson: Taking the 'A' Train

Not all research is conducted with a microscope. African American playwright Louis S. Peterson does his by poring over old newspaper clippings and talking to people.

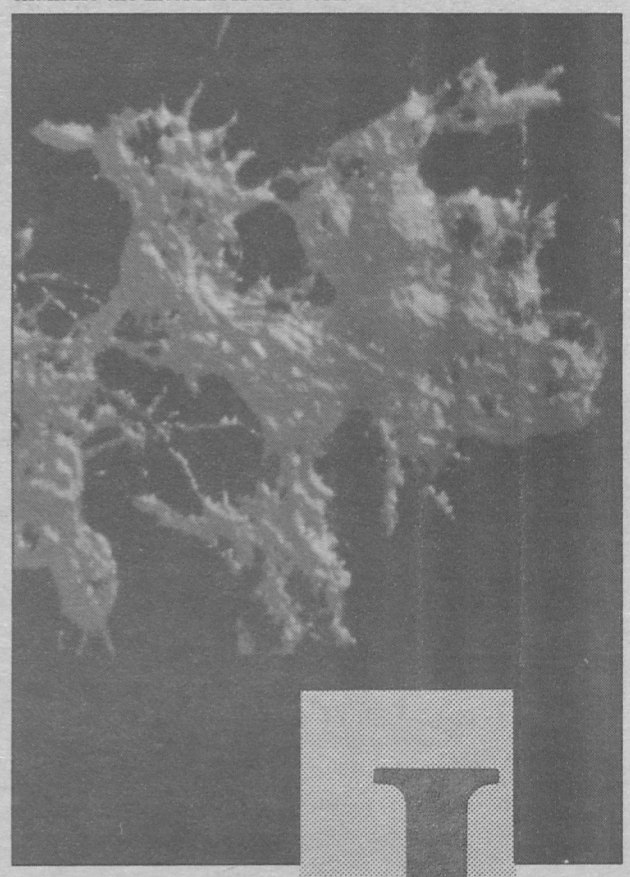
An associate professor of theatre arts, Peterson is using his eyes and ears to flesh out a script he's writing for a Broadway-bound musical based on *Take the A Train*, a novel by the late Michael Blankfort.

Peterson's already had several works to his credit, including the 1950s Broadway hit, "Take a Giant Step," and the movie script for "The Confessions of Nat Turner." That background drew producer Ken Lauber to his doorstep.

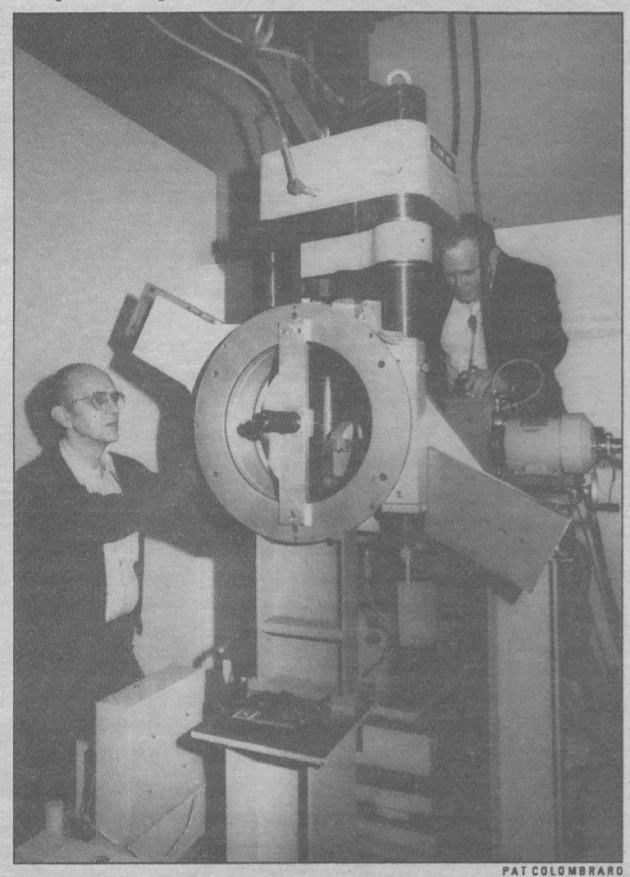
Lauber owns the rights to *Take the A Train*, the tale of a Jewish boy growing up in Harlem in the late 1940s and his adventures with a black gambler. "It's a charming story," Peterson says, but adds that he is taking liberties with the novel to strengthen the characters and to justify their friendship.

Presently a resident of lower Manhattan, Peterson has

A three-dimensional view of a cell enables researchers to examine the internal framework.



Geophysicists Robert Liebermann (left) and Donald Weidner probe deep Earth's secrets.

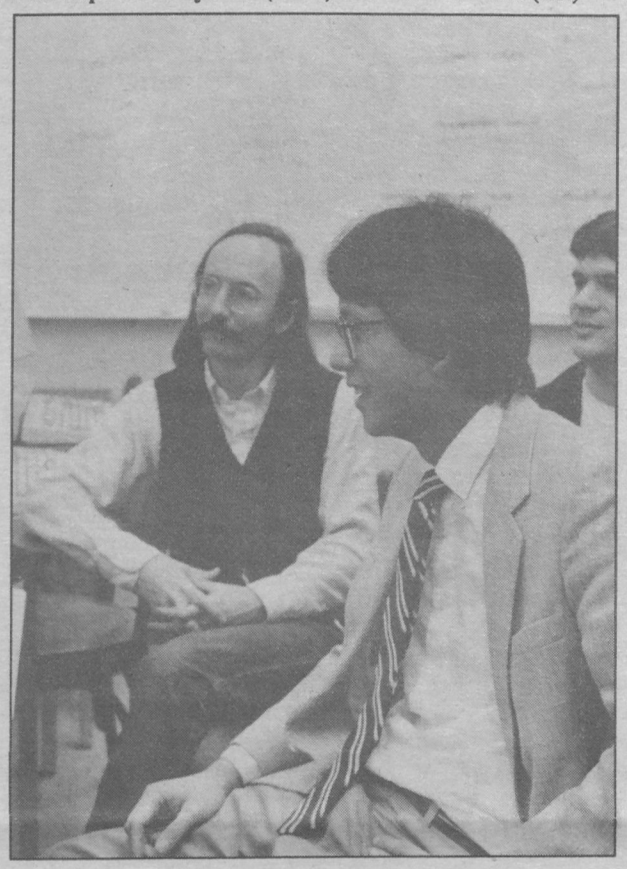


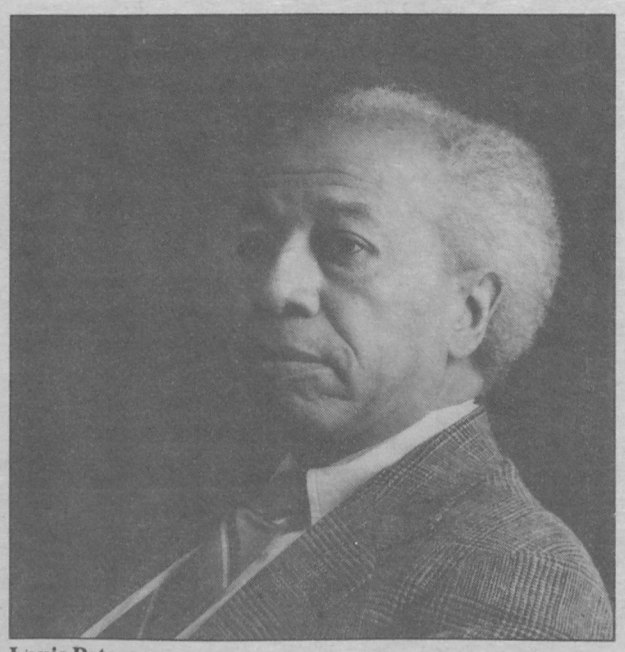
PAT COLOMBRARO

The Innovators

Whether in the basic or applied sciences, the humanities or the social sciences, Stony Brook researchers continue to revolutionize their fields with significant new discoveries.

Philosophers Gary Mar (front) and Patrick Grim (left)





Louis Peterson

a working knowledge of black culture in Harlem, having lived there for two years in the 1940s. But, he says, he didn't know much about the Jewish population at the time. He has researched the project by reading old newspapers and magazines, interviewing people who lived in Harlem in the 1940s and by talking to Jewish friends. He especially wanted to know more about Jewish traditions and religious doctrines.

He also researched gambling in Harlem, to better understand the main character's environment. "The bets were small, 50 cents to $5," Peterson learned.

The producer has hired a lyricist and a composer to work with Peterson to develop a jazz score for the show. If successful, the production could make musical history: Broadway shows are usually built on conventional musical scores.

The Look of Language

Colorful lines cut across the computer screen, up and down, intersecting, then sharply breaking into concentric boxes, smaller and smaller into infinity, then back again, larger and larger until the space between lines fills in.

This is what language looks like—or at least some paradoxical parts of it—and it bears a striking resemblance to the patterns found in natural phenomena ruled by chaos theory, two Stony Brook philosophers say.

Gary Mar, an assistant professor of philosophy, and Patrick Grim, an associate professor of philosophy, have spent a lot of time in Stony Brook's logic lab trying to map out a picture of language. "This project couldn't have been done without a computer," Mar says. "The calculations would have taken months."

Using a range of values between 1 for true and 0 for false, Mar and Grim developed a mathematical model for the semantics of language. They first graphed the ancient "Liar" statement: "This sentence is not true," which alternates forever between true and false.

They went on to graphically portray a second statement: "The actual truth of this sentence is half of its estimated truth." No matter what value between 0 and 1 was input into the computer, the result was two-thirds.

Next they formulated what they call the "Chaotic Liar": "The actual truth of this sentence is its estimated falsehood," or alternatively, "This sentence is true to the degree you think it is false."

Mathematical analysis of this sentence results in "genuine chaotic semantic behavior," a term which they defined for the first time in their work. Its graphic analysis results in the chaotically expanding and contracting concentric boxes.

Mar and Grim have submitted portions of their work to several journals in both mathematics and philosophical logic. "Their findings cannot be disputed," says Don Ihde, dean of humanities and fine arts. The significance of their work, he explains, is that they are finding the same patterns that apply to nature in structures created by humans.

Marx: Getting Inside an Atom

Physicist Michael Marx is preparing to lead an international group of scientists in a search for the smallest particles of matter as he coordinates the university's participation in the nation's superconducting supercollider (SSC) project.

The $7 billion accelerator, to be built in Texas, will enable scientists to look inside nuclear particles and detect others never seen before. Marx leads a consortium of more than two dozen institutions that will design a detector to measure the speed of muons and other particles to be produced in collisions inside the apparatus.

"Matter is like an onion with many layers," Marx explains. "There are the objects around us, which are made up of cells. Within cells is DNA, which is made up of atoms. Each atom has a nucleus. We think there are quarks inside the nucleus, though no one's ever seen one.

"The SSC will enable us to study quarks and see if they have yet another layer," he continues. "It will also enable us to study electromagnetic force, which is what makes matter rigid and allows us to walk on the Earth without gravity pulling us through.

"Work at the SSC will explain some asymmetries between the electromagnetic and a weak force that causes radioactive decay. This may be happening because of another particle called the Higgs particle. If Higgs exists, we can find it at the SSC."

Marx is marshalling an international group of researchers from industry, universities and national laboratories, to submit a preliminary proposal to the SSC laboratory. The scientists recently received a $170,000 grant from the New York State Urban Development Corporation to prepare the proposal which will be submitted to the federal government by May 25. The group plans to utilize magnets commonly used in fusion physics to measure energies of particles produced by collisions in the SSC accelerator

"We believe we have a good shot at getting the proposal accepted," Marx asserts. "We have the active participation of major aerospace industries—Grumman Space Systems and Martin Marietta Astronautics—in a field that had previously been considered the province of 'pure' science. And we're adapting technologies from the plasma fusion field and from the Strategic Defense Initiative/Star Wars as key elements in our design. That's an interesting example of 'spin-off technology' in reverse, from applied to pure research."

Gurvitch: The Promise of Superconductivity

Levitating trains. Faster computers. Endless reserves of energy. Such are the tantalizing promises held by superconductivity, the passage of energy without resistance. In the past few years, the field has exploded with the discovery of materials that can superconduct at higher temperatures. But scientists, hampered by a lack of basic knowledge about the new materials and frustrated by problems inherent in their use, need to know more.

Enter Stony Brook's Institute for Interface Phenomenon (IIP). The institute, formed last year with faculty from the departments of physics, chemistry and materials science and engineering, conducts basic and applied research in electronics and pays special attention to high-temperature superconductors.

IIP's Antony Bourdillon, professor of materials science, is studying how to make wires out of high-temperature superconducting materials. "So far scientists have been disappointed in their efforts to do this," says Michael Gurvitch, IIP director and professor of physics. "But once it's accomplished one can make very powerful magnets. Or you could make a giant coil that could store tremendous amounts of energy to draw on in a fraction of a second without any energy loss. These developments could make possible many of the science-fiction-like applications of superconductivity that we've heard about."

IIP is fabricating new high-temperature materials and devices, and is forming partnerships with industry to explore the commercial viability of its discoveries. "We

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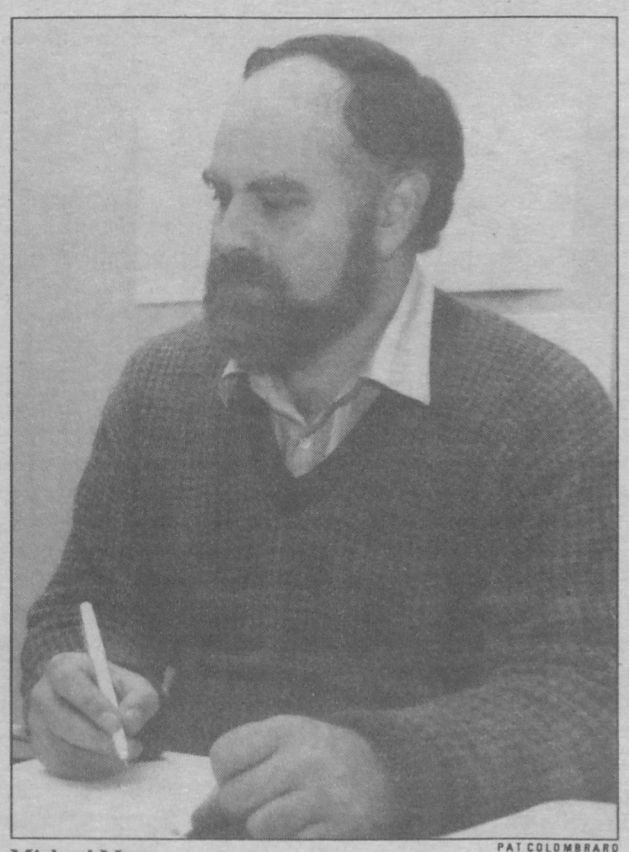
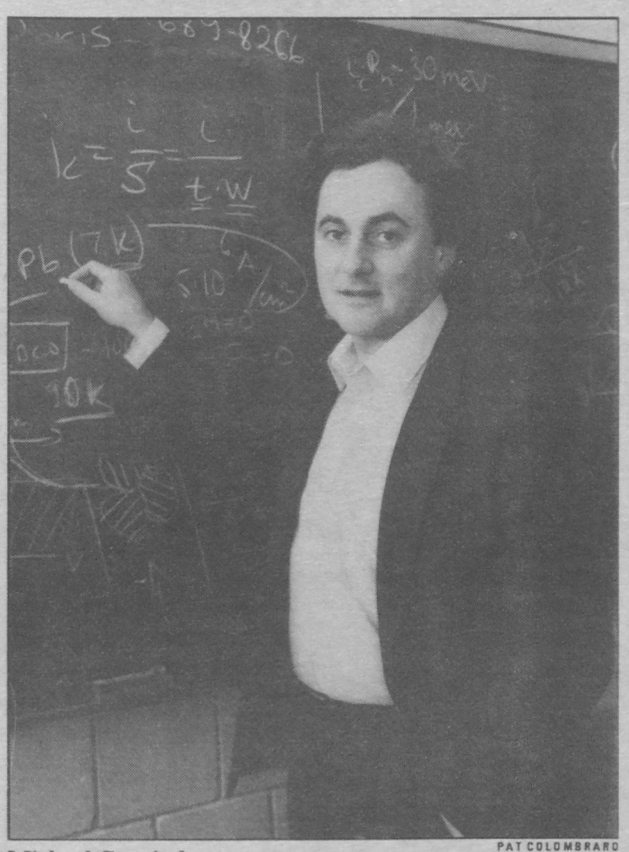


Michael Marx

PAT COLOMBRARO



Michael Gurvitch

PAT COLOMBRARO

The Innovators

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have a number of collaborations in place now, including one with Bell Laboratories in New Jersey to develop 'active' devices—which are not just passive elements but modify a signal in some way—based on high-temperature materials," says Gurvitch. "We're also planning to develop projects with Brookhaven National Laboratory."

IIP's Jim Lukens of the Department of Physics also continues to study lower-temperature materials, says Gurvitch, "because there may be some instances where the low-temperature technology really is better suited to the task you need to accomplish, like digital applications for computers. We need to compare the two technologies.

"High-temperature superconductivity is a magnificent phenomenon, but people are still debating its basic physics," explains Gurvitch. "At IIP we want to understand how it works so that we can begin to harness it."

Volkow: Cocaine's Addiction

A large donut-shaped machine takes pictures of a patient's brain as an intravenous tube supplies a dose of cocaine labelled with a radioactive tracer. This will mark areas of the brain where cocaine is found.

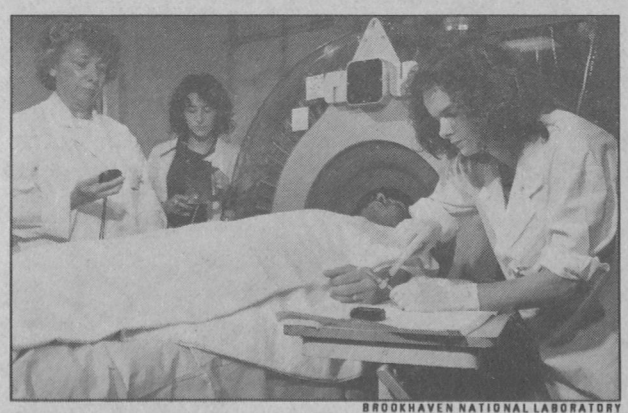
Using stopwatches, the staff of Brookhaven National Laboratory's Positron Emission Tomography (PET) measure the time it takes for the cocaine to flow through the bloodstream to the brain and how long it stays in the brain.

Why is cocaine so addictive? And what are the toxic toxic effects of cocaine on the brain? Nora Volkow, an assistant professor of psychiatry at Stony Brook and Brookhaven researcher, hopes to answer these questions.

PET scanning has only recently been used in the study of substance abuse. Unlike X-rays, which reveal structure, PET shows biochemical changes in tissues by measuring the concentration of a positron-emitting substance. The technology produces color images or "slices" of the brain and offers a first opportunity to look at human brain chemistry and function.

Despite a cocaine epidemic, there is very little known about the effects of the drug on the human brain. Working at Brookhaven National Laboratory, where the PET scanners are housed, researchers have demonstrated that cocaine binds to areas of the brain with a high concentration of dopamine receptors. They also found that cocaine abuse decreases the number of dopamine receptors.

Knowing what goes on in the brain can help researchers come up with better treatments. If chronic cocaine abuse causes a decrease in dopamine, drugs that enhance dopamine activity may prove to be the preferred therapy.



BROOKHAVEN NATIONAL LABORATORY

Nora Volkow (right) and colleagues Noelwah Netusil and Renee Moadel study the effects of cocaine on the brain.

Kaufman: A New Perspective on Cells

In an important step toward understanding disease and treatment, researchers in the departments of anatomical sciences and computer science have created a three-dimensional computer image of a cell, a technique that may help scientists better understand how cells work.

"Three-dimensional images provide scientists with a new perspective on the inner view of a cell," says Ilan Spector, an associate professor in the Department of Anatomical Sciences. "I can look into the cell and see its component parts in relation to one another."

The model is a key first step toward a new scientific research tool, based on a technology being developed by Arie Kaufman, a professor in the Department of Computer Science, and Roni Yagel, a graduate student.

The ability to examine structures, such as the internal framework of a cell, is limited by conventional microscopes which only "see" in two dimensions. The new computer process will not only permit observation of the object in three dimension, but will also enable the researcher to reveal the inside.

The ultimate goal of Kaufman and Yagel's initiative is to provide the tools that will allow the biological researcher to visualize an object in three dimensions and study the image instead of the actual specimen. The technique will be a major advance for those working on specimens that are especially delicate, limited in supply or difficult to work with.

O'Leary: Spouse Abuse

The goal of researchers in the Department of Psychology is to understand what generates physical aggression and to use that information to prevent the onset of violence between partners.

While it has been widely recognized that alcohol and drug abuse play an important role and that a history of family violence is significant, new findings suggest that "the most significant predictive behavior is a verbally aggressive style among the partners. Within one year of the onset of verbal aggression, physical violence tends to follow," says Dan O'Leary, director of the Marital Therapy Clinic and distinguished professor of psychology.

The research involved a three-year longitudinal study of 400 couples from Long Island and Syracuse, NY, tracing their relationships from before their weddings through the first 30 months of marriage.

Other predictors of physical aggression have turned up in the research, O'Leary says, including an aggressive, impulsive personality style and a history of fighting in junior or senior high school.

Graduate student Jean Malone, working with the longitudinal study, says that although women are perceived to be the victims of most incidents of aggression, men and women appear to attack their partners equally. The key difference is that men tend to inflict more serious physical harm to their partners than women.

About 50 percent of the couples in the study reported some physical aggression. Malone has found that violence in the parental home is a more accurate predictor of spousal aggression initiated by men than it is for aggression initiated by women. A history of physical fighting is a better predictor of aggressive behavior in women.

Weidner and Liebermann: Homegrown Rocks

There are mysteries deep inside the Earth, too deep for most scientists to reach. Geophysicists Donald Weidner and Robert Liebermann have found a way to unlock them.

Using huge hydraulic presses—one so large it had to be lowered through the lab roof—the researchers duplicate conditions found 1,000 kilometers below the Earth's surface. This enables them to squeeze minerals until they form crystals identical to those actually found at subterranean depths.

The results are telling scientists more about forces that cause earthquakes and volcanos, and yielding clues about what the Earth's core is made of. The work is also attracting the attention of industries who can use Stony Brook's lab-grown rocks to better understand how to develop superhard ceramics, commercial diamonds and high-temperature superconducting materials.

Stony Brook was one of 30 institutions (out of 150) to receive a site visit from the National Science Foundation. The NSF is considering the Mineral Physics Institute and its high-pressure facility as part of a national science and technology center, which would bring $2.5 million annually in federal funding.

So far, Liebermann, Weidner and their colleagues have created temperatures of 2,400 degrees Centigrade and pressuers of 260,000 atmospheres (normal pressure on the Earth's surface is 1 atmosphere). That matches conditions found 1,000 kilometers beneath our feet. They do it with two presses, one 12 feet high and weighing 18 tons, the other several tons and standing 8 feet high.

"No one's ever brought up samples from further down than 300 kilometers," notes Weidner. "So we make our own." The crystals are tiny, most being the diameter of a human hair, and form rocks several millimeters in size. "Some samples are craggy-looking, but some are really beautiful," Weidner says. "Any color crystal you want, we can make it. There's a certain amount of art to this."

Special Programs Help Area Students Pursue Research Careers

The number of African Americans earning advanced degrees has sharply declined in all fields, says Myrna Adams, assistant vice provost for graduate studies. African Americans and Latinos rarely pursue the sciences and engineering, she adds, while Asian Americans are underrepresented in the humanities, social sciences and education.

To help reverse this trend, special programs offering financial support, guidance and close association with researchers are available at Stony Brook. Some programs, such as the Science and Technology Entry Program (STEP) are available to students as early as junior high school to identify those with an interest in the sciences. Once they attend college, C-STEP, the college-level equivalent, is available.

With funding from the State Education Department, C-STEP is aimed at college students interested in scientific, technical and health-related fields. Approximately 250 participants receive tutoring, academic and career counseling, and assistance in job placement by the Department of Technology and Society in the College of Engineering and Applied Sciences.

"The philosophy of this program is to help participants achieve a high level of competence so that they can compete with students who might have stronger preparation in mathematics and science," says C-STEP co-director Edith Steinfeld.

Summer internships in nursing and physical therapy are arranged by C-STEP for several students each year. Another summer program, sponsored by the National Science Foundation, offers two months of research experience to 10 undergraduates in the field of chemistry and another 10 in physics. Research Experience for Undergraduates (REU) offers a $2,000 fellowship, free room and travel expenses to U.S. citizens or permanent residents in their junior or senior year.

While this program is available to any college student, preference is given to applicants from groups which are underrepresented in those fields, and that includes women, notes Wendy Katkin, program director and associate dean of the College of Arts and Sciences.

A similar program, called Minority Research Apprentice Program (M-RAP) also offers a summer of active research to undergraduates in marine sciences, mathematics, chemistry or physics to encourage students to begin thinking of themselves as scientists or mathematicians.

M-RAP also offers a research track in the social sciences of economics, political science or psychology. Participants are given a 30-hour introduction to research techniques and then participate in a research seminar in which they apply this training to actual research projects.

Financial support is also available for graduate students from underrepresented groups to pursue research. The W. Burghardt Turner Fellowships currently support 45 doctoral students at Stony Brook. Funded by the State University of New York, the fellowship program was named for the Stony Brook professor emeritus of history. Statewide it supports 300 graduate students.

Patricia Roberts Harris Fellowships in marine sciences, physics, chemistry and cellular biology—funded by the U.S. Department of Education—are available to women and minorities. Applicants should contact the departments in which they work for details.

Our Endangered Planet

continued from page 1

toward solving another dilemma: improving the frequently inaccurate computer models scientists now use to predict long-term climate change.

Cess directs a U.S. Department of Energy project that uses ERBE data obtained from satellites. These data tell him and other project scientists what climate conditions were actually like during a given period.

"Then we `hindcast'", Cess explains. "That means we give the models a set of parameters for that period and see which model comes closest to representing what really happened. We'll use this method to adjust the models until we get them to work accurately."

And none too soon. We've already run out of time, says Cess. "The greenhouse effect is a reality," he warns. "Even if we stopped burning fossil fuel today, we'd still feel effects in a decade or two." Sea level will rise, he predicts. Soil moisture and rainfall changes will affect agriculture. "But we don't know the precise levels of the changes," he says. "At this point, all we know is that changes will happen. Until then we've got to keep making the most of the information we have, obtaining more, and doing the best we can to use it accurately."

Saving the Tropics

For Barbara Bentley, it's not enough to tell people about saving the rain forests. She shows them, in person.

Bentley, associate professor of ecology and evolution, leads influential corporate and government employees into the Costa Rican rain forest for week-long educational (and consciousness-raising) forays. With 200,000 square kilometers of tropical forest being lost worldwide each year, she says "there soon may be no more forests left to save."

The trips are sponsored by the Organization for Tropical Studies, and funded by the Hewlitt Foundation of Hewlitt-Packard. Bentley leads groups of 20 Congressional staffers, members of government agencies or executives with international banks. "I show them why it's imperative to preserve and manage tropical environments, not only from a purely aesthetic point of view but politically and economically as well," she says. Bentley points out that almost all prescription drugs used today were originally isolated from tropical plants. Since 90 percent of tropical plant species have yet to be studied, rain forests represent a vast untapped source of pharmaceuticals. There's also the economic potential of "ecotourists," people who travel to the tropics, specifically to see national parks. Perhaps most important is the mitigating effect rain forests have on greenhouse gases; the forests remove carbon dioxide from the atmosphere through photosynthesis.

Why not take members of Congress to the forests, rather than their staffs? "We tried that, but they have busy schedules and can't commit to us for a whole week," Bentley says. "Besides, the people who actually write the legislation are often members of Congressional staffs. These are the people we want to educate, and we hope that in turn they'll educate the people they work for."

Bentley and her campers have had what she calls "some pretty amazing experiences." She recalls one evening walking the shore, watching for sea turtles. "Suddenly, these six-foot-long leatherbacks were rising up out of the water to lay their eggs," she says. "Everyone was speechless with wonder.

"But there along the beach were Nicaraguan refugees who were stealing the eggs for food. It was a dramatic way to demonstrate to the group how politics sometimes gets tied into the whole question of protecting an endangered species like the turtles."

A Population at Risk

The next logical question after "What's happening to our environment?" is: "What's happening to us?"

Arthur P. Grollman and colleagues hope to find out. Grollman, a professor of medicine and pharmacology and chair of the Department of Pharmacological Sciences, is directing several programs aimed at finding out more about how environmental toxins affect DNA.

"We think it's important to develop and apply molecular techniques," says Grollman, "to study DNA damage resulting from exposure to mutagenic agents that cause genetic defects and cancer. We need to know early on who's at risk."

For the past three years, Grollman and colleagues have been studying such DNA-damaging substances as toxic industrial chemicals, carcinogens found in cigarette smoke, drugs used in chemotherapy and ionizing radiation. The group is looking at the chemistry of these substances, and at the molecular biology of the DNA itself after damage occurs. The project, supported by a $5.4 million program/project grant from the National Institutes of Environmental Health Sciences (NIEHS), includes Grollman, Francis Johnson of the departments of chemistry and pharmacology, and pharmacology faculty Dan Bogenhagen, Paul Fisher, Masaru Takeshita, Miguel Berrios and Moshe Eisenberg.

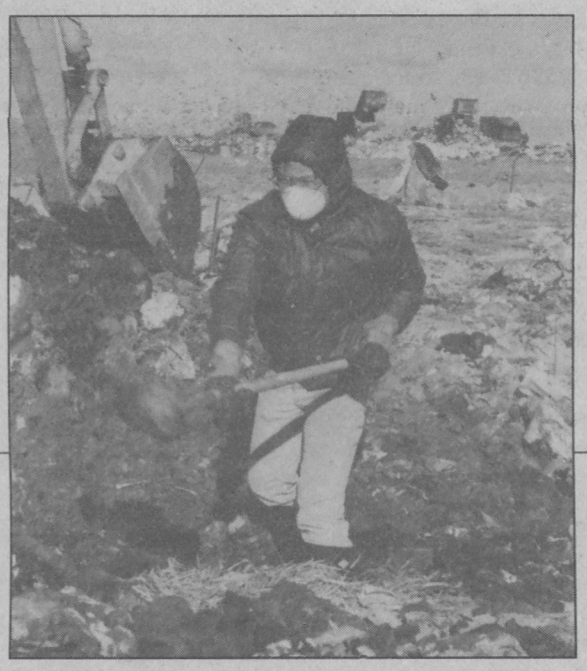
Grollman is about to take this research on the road. As an offshoot of the NIEHS project, he'll work with scientists in China, Thailand and the Soviet Union to study the effects of environmental toxins there. Governments of these agricultural countries, says Grollman, are concerned about the effects of pesticides. The Soviets also want to assess possible genetic damage caused by radiation released during the Chernobyl incident.

Although environmental problems in the United States differ from Asia's, Grollman says results of the proposed study could be used to help answer environmental toxicity questions raised here. "In this country people worry about chemicals present at one part per 10 billion," he notes. "The samples we'll be looking at involve very high levels of exposure, so we'll be able to easily study the effects.

"You have to establish whether there's a threshold effect," he continues. "Is there a level below which the toxin doesn't cause serious damage? Until we answer that question, it is difficult to make risk assessment policy here or any other place."

Closer to Home

It's a dirty job, but somebody has to do it: researchers Vince Breslin (left) and John Gordy (right) scoop out a site to test new biodegradable plastics.



Marine Sciences doctoral student Boen Li is knee-deep in garbage at the Town of Brookhaven landfill.

Every person in this country produces two-thirds of a ton of refuse per year. The Marine Sciences Research Center has found ways to help us deal with it.

The center's Waste Management Institute (WMI) was created in 1985, and charged with moving beyond mere waste disposal questions to tackle issues of waste management. As the region turns from landfill to incineration of solid waste, WMI scientists are developing safe, practical uses for the ash that would be generated (a quarter of a million tons each year in Nassau and Suffolk Counties alone, predicts Marine Sciences dean and director J. R. Schubel.)

WMI researchers have found that ash can be substituted for rock and gravel in the manufacturing of concrete blocks. In the process, the ash is chemically and physically stabilized, as the scientists have discovered in monitoring two artificial fishing reefs made of the blocks off Long Island's north shore. After two years, says research professor Frank Roethel, they've observed no adverse environmental effects, the blocks are holding up physically, and the reefs are attracting a number of aquatic species.

Construction on another test structure, a boathouse to be used as storage for smaller research vessels operated by Marine Sciences, is scheduled to begin this spring. Researchers will monitor the building closely for a minimum of two years. The WMI is also exploring the development of poured concrete reinforced forms using the ash/concrete mix, to be used as a stronger substitute for cinder blocks.

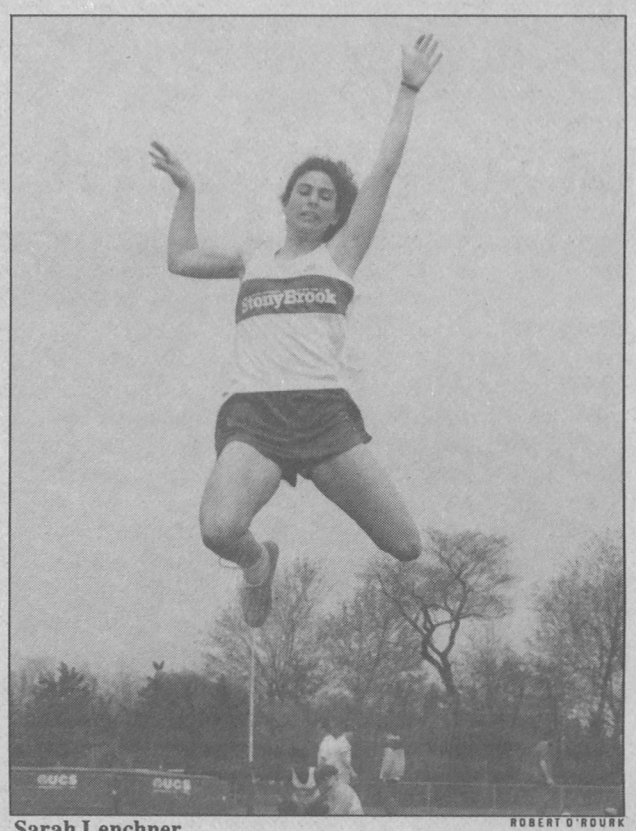
Are the new "biodegradable" plastics really that? WMI director R. Lawrence Swanson and WMI researchers Vince Breslin and Sheldon Reaven are conducting a two-year study to see how the plastics hold up. They've placed samples in the Town of Brookhaven landfill, at a shoreline research station, and in compost. Results so far are preliminary, says Breslin, "but we're seeing some degradation, especially at the shoreline site."

With Marine Sciences researcher Nick Fisher, Department of Ecology and Evolution chairman Jeff Levinton is examining what he calls "the most metal-polluted site in the world." It's Foundry Cove off the Hudson River, former site of a battery factory and a virtual cesspool of nickel cadmium. Levinton (who's also director of research for the Hudson River Foundation) and Fisher are studying flies and worms that have evolved to become genetically resistant to the pollution around them.

"They're getting into the food web," says Levinton. "You have to worry about what substances they're transferring to other organisms that eat them." He and Fisher are now determining how much of the cadmium passes out of Foundry Cove into the rest of the Hudson.

Earth Day 1990: USB's "Global Change Study Group", 17 faculty from departments working on environment problems, will hold an Earth Day Symposium Sunday, April 22 in the Javits Lecture Center from 12:30 to 5 p.m. The program will be cosponsored by MSRC, the Institute for Terrestrial and Planetary Atmospheres, the Museum for Long Island Natural Sciences and Suffolk County.

Lenchner Is Stony Brook's First National Champion



Sarah Lenchner

By Ken Ilchuck

When Sarah Lenchner attended school in Israel, her classmates called her "Kanga" because she was good at a jumping game called "three sticks." The name hasn't stuck, but her talent has.

Last month, at the NCAA Division III National Indoor Track and Field Championships, Lenchner became the first national champion in Stony Brook athletic history. Her jump of 39 feet, 7-3/4 inches in the triple jump set a national meet record, and her jump of 18 feet, 8-3/4 inches in the long jump was more than two inches longer than her closest competitor.

"It took a couple of days to really sink in," Lenchner said, "I didn't know what to do with myself."

In her first event, Lenchner defeated two-time defending national long jump champion Sheila Trice of Christopher Newport College on the first day of the competition. "Last year I just wanted to place and make All-American," Lenchner said. "This year I wanted to win."

The following day, Lenchner continued her success winning the triple jump, defeating Trice, the defending indoor champion and Vera Stenhouse of Tufts, the defending outdoor champion.

"Vera has been Sarah's nemesis for the past two years," said Stony Brook head coach Steve Borbet. "Sarah lost to her at the outdoor nationals last year and at the ECAC Championships last week. I think Sarah was motivated and turned the trick. I think she just got tired of finishing second."

However, Lenchner wasn't finished after the triple-jump victory. Immediately after, she competed in the high jump and broke her own Stony Brook record finishing fourth and earning her third All-American honor of the weekend.

"I was a little sore from jumping all weekend, but I don't think it affected my high jump," Lenchner said. "My goal in the high jump was to break my record."

As for Borbet, he is delighted to have a national champion. "I think this is a monkey off the university's back. In track alone, we've had so many people come in second. It's nice to finally have someone win."

Borbet feels there are several reasons that Lenchner became a champion. "She's a natural athlete, but she has a great work ethic as well. She really works hard, but she also has an advantage in that she has trained in two different countries. The combination of training styles has worked well for her."

Lenchner started her track and field career as a fourth grader in Israel. She was introduced to the sport by a friend, whose father ran a family sports day at Tel Aviv University. "I used to just go and watch, but then my friend's father invited me to compete. In my first meet, I ran the 600 meters and that's when I decided I would stick with jumping. I've always been a jumper."

Soon after, Lenchner joined a youth track club, and remains a member today. "I ran at the Israel National Championships last summer and placed second in the long jump and the high jump."

Lenchner came to the United States in April 1988, after a mandatory two year term as a shooting instructor in the Israeli National Army. "I wanted to go to college in the United States and see what life was like here." With her father living in White Plains, Sarah decided to look at schools in the New York area.

A dean's list student with a 3.7 grade point average, Lenchner knew little about intercollegiate athletics when she arrived in this country. "I didn't understand anything about college sports. I didn't even know there were separate divisions. But I liked it here. I have enjoyed my professors and my teammates."

As for the upcoming outdoor season, both coach and athlete look forward to the challenges that come with being a national champion. "It's hard to win a championship, but it's even harder to defend it," said Borbet. "Everyone wants to beat the champion. A lot of people will be gunning for her in the spring."

"It's much nicer than coming in second," said Lenchner of winning the national championship. "I'm not worried about the competition. I just want to do well in the outdoor season. If I work to improve myself, winning will fall into place."

Lenchner has other goals besides being national champion. She would like to graduate in four years and attend graduate school, but her main goal is much more far reaching than that. "Everyone says, 'if only I had done this or that.' When I'm done with college, I hope I'll be able to say I was as good as I could be."

Ken Ilchuck is a graduate assistant in the Office of Sports Information.

Stony Brook Sports Briefs

• **The Stony Brook Squash Team** received the National Intercollegiate Squash Racquets Association (NISRA) Coaches' Award at the National Intercollegiate Team Championships. The award, which is selected by the coaches, is presented annually to that team which best exemplified the ideals of sportsmanship in squash. It is the second time in three years that the Patriots have been so honored.

• **Claudette Mathis,** a senior on the Stony Brook women's track team, competed in the NCAA Division III National Indoor Championships at Smith College March 8-10. Claudette finished seventh in the 800-meter race with a time of 2:18.49.

• **Jay Warshaw,** a senior on the Stony Brook men's squash team, became the first player in school history to advance to the quarterfinal round of the NISRA Singles Championship. Warshaw defeated All-American players from Cornell and Dartmouth in the opening rounds, and was named to the National All-Tournament Team.

• **Suzanne Nevins,** a senior diver on the Stony Brook women's swim team, competed in the NCAA Division III National Swimming & Diving Championships at Williams College March 6. Nevins finished 38th in the one-meter dive, and 43rd in the three-meter dive.

• **Rich Seeley,** a senior on the Stony Brook men's swim team, competed in the NCAA Division III National Swimming & Diving Championships in Deer Brown, WI March 16-17. This was the second consecutive year Seeley has represented Stony Brook at the championships.

Patriots Capture ECAC Title

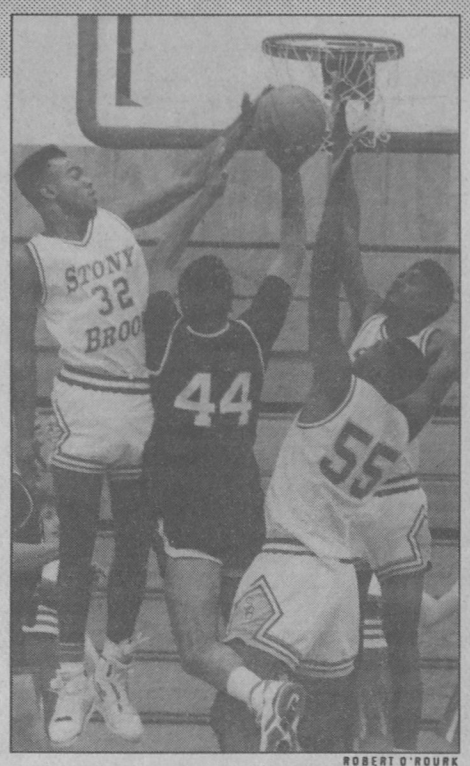
At the begining of the season, Stony Brook head basketball coach Joe Castiglie set two goals for his team: 15 wins and a post-season tournament bid.

By the season's end, the team no only reached both goals, but did so in impressive fashion. The Patriots' 83-77 overtime victory over the Mariners of the United States Merchant Marine Academy March 10 gave Stony Brook the ECAC Metropolitan New York/New Jersey Championship and 24 victories for the year.

"I'm very proud of these players," Castiglie said after the victory. "They just refused to give up."

The Patriots, down by as many as 13 points in the second half, put on a 19-6 run and tied the game at 72 near the end of regulation. Stony Brook fell behind early in the overtime period but junior co-captain Yves Simon converted two steals to tie the game at 77. The Mariners failed to score on their next possession, and after Simon grabbed an offensive rebound and converted two foul shots, the victory was sealed.

"We rushed early on," said Simon. "We had to settle down, and play good defense. Once we did that, things started to come together."



"Before the game, I told the team that defense would be the deciding factor," said Castiglie, "and that's exactly what they did, the went out and played great defense."

The Patriots won two other games to reach the tournament championship. On March 3, they turned in an 88-84 victory against a competative eighth seed Kean College team. Stony Brook was lead by Emeka Smith's 26 points, and co-captain Steve Hayn's 20 point, nine rebound per-formance. Simon also had a strong game with 14 rebounds.

In the semifinals March 7, the Patriots defeated fourth seed New Jersey Tech 85-72. Freshman Chris Carlson had a season high 16 points, Simon had a team high 17 points and 15 rebounds, and Hayn added 12 points to advance Stony Brook to the finals.

"We just missed the NCAA Tournament," said Hayn. "I think we were playing angry. We had something to prove ."

According to Simon, it was a total team effort that brought the championship to Stony Brook. "We put our heads together and did what we had to do to win. There was always someone picking up the slack, either Hayn or Foskey. We wanted to win the final game for (seniors) Foskey and Pallone."

Foskey was glad his Stony Brook career ended as it did. "This is a great way to leave. Coach Castiglie's leadership and my teammates have been great. It's been four years well spent."

FORTNIGHT

COMING EVENTS AT THE UNIVERSITY AT STONY BROOK • APRIL 16-30, 1990

CYLLA VON TIEDEMANN

Toronto Dance Theatre has been called "a company of physically and expressively strong dancers with the technique and the soul to perform dramatic . . . works." Though their approach to dance is modern, the music they use includes classical, folk and contemporary. They will perform on the Main Stage of the Staller Center for the Arts, Saturday, April 21 at 8:00 p.m.

ANN BEGAM

"Oozeball '90," the Student Alumni Chapter's annual mud volleyball tournament, takes place Sunday, April 29, 9:00 a.m. - 5:00 p.m., at Roosevelt Quad.

NOTICES

Beginning with this issue, every other edition of *Fortnight* will be part of *Currents*. *Fortnight* will still contain the two week calendar and events highlights, as well as news and notices from around the campus. To place information in *Fortnight*, call Larry Friedman, 632-6084.

Second Annual University Association Plant Sale. Proceeds will benefit a campus organization. May 11, 10:00 a.m. - 3:00 p.m., Second Floor Lobby, Administration.

Student Assistants are needed to work at commencement. The residence hall move-out deadline will be extended for successful applicants. Apply at the Office of Conferences and Special Events, 440 Administration. Applications will be accepted until 60 aides are hired.

"Electric Currents" is now available as a main menu option for All-In-1 users. Simply enter "EC" to see the latest news, notices and events.

Annual Spring Events Build Stony Brook Pride

Campus Clean Up Day Scheduled for April 27, Community Day for May 5

Two Stony Brook traditions return again this spring. On Friday, April 27, it's time to get outdoors and join faculty, staff and students for the annual "Campus Clean Up Day." And Saturday, May 5, the university will celebrate "Community Day," Stony Brook's open house.

"Clean Up Day provides an opportunity for everyone to pitch in and make the campus look great," says Ann Forkin, director of conferences and special events. "Last year, more than 150 people turned out for the event. We hope even more will come this year."

The clean up begins at 9:30 a.m. Throughout the day, teams of volunteers will go out on one of three shifts—9:00 a.m.-11:00 a.m.; 11:00 a.m.-1:00 p.m., and 1:00 p.m.-3:00 p.m.—to paint, sweep, plant, repair, or tackle other campus projects that need to be done.

Among the projects being undertaken this year are landscaping flowerbeds and shrubbery; replacing woodstrips and the split rail fence around H-Quad; repainting the sculpture outside the Staller Center for the Arts and the zebra stripes leading to the Stony Brook Union/bookstore area; and picking up litter around campus.

All volunteers will receive name tags, hats specially designed for the day, the equipment needed for the clean up and refreshments. There will also be a 3:00 p.m. reception for all participants in the First Floor Lobby, Administration.

Community Day also promises to be a day filled with fun and camaraderie as faculty, staff, students and alumni, along with their families and friends, are invited to the annual celebration, held on campus from 11:00 a.m. to 3:00 p.m.

Tidying up the grounds was one of the projects tackled during last year's Campus Clean Up Day.

Filled with numerous activities, Community Day is cosponsored by the Faculty/Student Association. Highlights will include exhibits, hands-on demonstrations, lectures, laboratory tours and tours of the campus, a complimentary family barbecue lunch—cooked and served up by senior Stony Brook officials—and a large tent packed with informative activities the whole family will enjoy.

Also scheduled is the student/alumni softball game at 1:00 p.m., a Stony Brook men's lacrosse game vs. the University of Pennsylvania at 1:30 p.m. and a Department of Theatre Arts production of *The Taming of the Shrew* at 2:00 p.m.

To volunteer for Clean Up Day activities or for information about Community Day, call the Office of Conferences and Special Events at 632-6320.

These children had mixed reactions to the Marine Sciences Research Center's display of fish, one of the many exhibits at last year's open house.

Student Polity Presents Spring Concerts

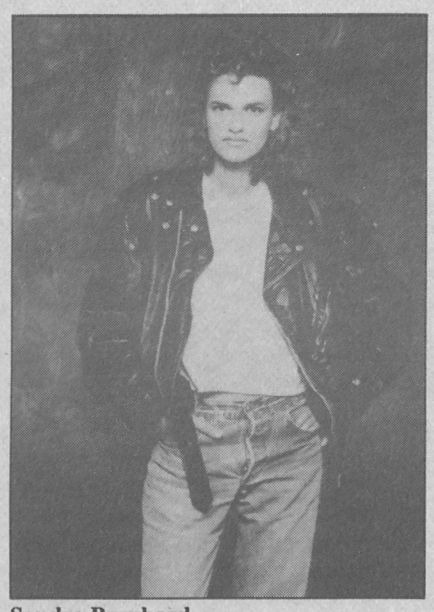
Sandra Bernhard has been seen hanging out with Madonna of late, joining her recently for the "Don't Bungle the Jungle" concert to save the Brazilian rain forest. Later this month, she brings her special brand of humor to Stony Brook with "Sandra Bernhard Live!" British new music groups the Mighty Lemon Drops and the Psychedelic Furs are also traveling to Long Island as part of their spring tours; all three acts are presented by the Student Polity Association.

Bernhard, the star of the successful one-woman Broadway show, "Without You, I'm Nothing," co-starred with Robert DeNiro in Martin Scorcese's film "The King of Comedy." She has also been a frequent guest on the "David Letterman Show" and has modeled for The Gap.

The Mighty Lemon Drops originally hail from England. Formed in 1985, the group features Keith Rowley on drums, Paul Marsh, vocalist, David Newton on accoustic and electric guitars and Marcus Williams on bass. Producing a sound descended from Beatles pop, the band has released three albums since 1985. "Inside Out" and "Fall Down (Like the Rain)" are among their best known songs; their current single is "The Real World."

Led by brothers Rich and Tim Butler, the Psychedelic Furs' music runs the gamut from post-punk to pop. They hit the American charts in the late 1980s with the title song to the film "Pretty in Pink," and recently headlined a benefit concert for People for the Ethical Treatment of Animals (PETA) in New York City.

Tickets for "Sandra Bernhard Live!" are $15 for non-students and $11 for students. The performance is Tuesday, April 17; SB Ballroom doors open at 9:00 p.m. Tickets for the Mighty Lemon Drops are $8; $12 for non-students and $10 for students at the door. The concert is Friday, April 20; SB Ballroom doors open at 8:00 p.m. Tickets for the Psychedelic Furs are $12 for non-students and $10 for students in advance; $15 at the door.



Sandra Bernhard

The concert is Saturday, April 28; SB Gymnasium doors open at 8:00 p.m. Tickets are available at the Union Box Office and at Ticketmaster locations. For information, call 632-6464.

CALENDAR

MONDAY APRIL 16

Advance Registration for fall semester begins. Through May 4.

FSA Flea Market. 9:00 a.m. - 4:00 p.m., SB Union. Every Monday and Thursday.

The Wellness Program, "Aerobics." Ongoing, begin anytime. The costs are $32 for 16 classes, $50 for 25 classes. Open to USB faculty and staff. 11:45 a.m. - 12:40 p.m., Small Gym, SB Gymnasium. Call 632-6136. Every Monday, Wednesday and Friday.

Sacrament of Reconciliation. 4:00 - 4:45 p.m., Interfaith Lounge, Room 157, Humanities. Every Monday.

Weekday Mass. 5:00 p.m., Interfaith Lounge, Room 157, Humanities. Every Monday and Wednesday.

Humanities Institute Film Series, North American Women Directors, (double feature), "Craig's Wife" (1936), directed by Dorothy Arzner, about a woman who cares more about her possessions than her marriage; and "The Outrage" (1950), directed by Ida Lupino, which is about a rape. Cosponsored by the Humanities Institute, the Greater Port Jefferson Arts Council, the Port Jefferson Village Cinema and Theatre Three. Tickets are $3. 8:00 p.m., Theatre Three, 412 Main Street, Port Jefferson. Call 632-7765.

Vietnamese Students Association. 9:00 p.m. Room 237, SB Union.

TUESDAY APRIL 17

Students Towards an Accessible Campus (STAC) Bake Sale. 9:00 a.m. - 1:00 p.m., Lobby, Ward Melville Social and Behavioral Sciences Building.

All-In-1 Demonstration, "Introduction to All-In-1," introducing novice and beginning users to All-In-1. 10:00 a.m. - noon. Call 632-7795.

Psychiatry and Behavioral Science Grand Rounds, "Personality Disorders," Glen Davis, Henry Ford Hospital. 11:00 a.m. - 12:30 p.m., Lecture Hall 4, Level 2, Health Sciences Center Tower.

The Wellness Program, "Cholesterol Countdown." First of five classes. A comprehensive weight and dietary cholesterol modification program. $7.50 fee. Open to USB faculty and staff. Noon - 1:00 p.m., Room 223, SB Union. Call for time.

Men's Baseball vs. St. Joseph's College, 3:30 p.m.

The Wellness Program, "Smoking Cessation Seminar." A combination of behavior modification techniques and hypnosis. Attend the first 45 minutes free, then decide if you think the balance of the program suits your needs. Preregistration is necessary. Open to USB faculty and staff. Noon - 2:00 p.m., Room 226, SB Union and 4:30 - 6:30 p.m., Room 155, Level 3, Health Sciences Center.

Science Fiction Forum. 5:00 p.m., Room 043, Central Hall. Every Tuesday.

Eighth Annual Ceremony for Undergraduate Excellence. The ceremony will include introductory remarks by Frederick R. Preston, vice president of the Division of Student Affairs; presentations by Egon Neuberger, vice provost of undergraduate studies and Tilden Edelstein, provost; and the presentation of President's Awards for Excellence in Teaching by President John H. Marburger. 5:00 - 6:30 p.m., Main Stage, Staller Center for the Arts. Call Patricia Long, 632-7028.

The Group Shop Workshop, "Adult Children of Alcoholics." This workshop will discuss the problems encountered by children growing up in an alcoholic home. Theoretical understandings of the situation will be addressed and techniques to deal with the situation will be presented. Participation is confidential. Sponsored by the University Counseling Center. 7:00 - 8:30 p.m. Open to all USB students, faculty and staff.

Caribbean Students Organization (CSO). 9:00 p.m., UNITI Cultural Center, Roth Quad Cafeteria. Every Tuesday.

Student Activities Board Comedy, "Sandra Bernhard Live!" The star of her own one-woman show on Broadway and frequent David Letterman comes to Stony Brook. Tickets $15, $11 for USB students. 9:00 p.m., SB Union Ballroom. Call 632-6464.

WEDNESDAY APRIL 18

Spring Walkabout. A mile and a half walk around campus to celebrate spring and invite faculty and staff to join the walking program. A semi-annual tradition sponsored by the Employee Relations Council. Raindate April 18. Open to USB faculty and staff. Noon, academic mall outside Administration. Call 632-6136

Symposium: "Decisions to Limit Medical Treatment," sponsored by the School of Medicine's Institute for Medicine in Contemporary Society. A two-day symposium. April 18 will feature presentations concerning decisions to limit medical treatment in a clinical context. 2:00 - 4:00 p.m., Lecture Hall 1, Health Sciences Center. April 19 concerns decisions to limit medical treatment in a societal context. 8:00 a.m. - 12:30 p.m., Lecture Halls 1 and 4, Health Sciences Center. Call 632-6320.

Library Staff Association Book Sale. 10:00 a.m. - 3:00 p.m., Gift Book Room, Melville Library. Call 632-7110. Through April 19.

The Wednesday Noontime Series. A tradition of brief recitals, featuring every imaginable ensemble in a varied repertory. Noon, Recital Hall, Staller Center for the Arts. Call 632-7330. Every Wednesday.

Humanities Institute Biweekly Faculty Discussion Series. "European Futures," Dick Howard, professor of philosophy. Noon, Room E-4341, Melville Library. Call 632-7765.

Campus N.O.W. Lecture, "The Well-Being of Working Mothers: What Helps and What Doesn't," Anne Hunter, graduate student in psychology. Noon, Room S-216, Ward Melville Social and Behavioral Sciences Building.

Ecology and Evolution Seminar, "Local Genetic Differentiation and Breeding System Evolution in Touch-Me-Nots," Johanna Schmitt, Brown University. 3:30 p.m., Room 038, Life Sciences.

Biophysics Faculty Seminar, "Neuronal Activity and Second Messengers," Steven Siegelbaum, Columbia University. 4:00 p.m., Room 145, Level T-5, Basic Health Sciences Tower.

Women's Softball vs. Mercy College, 4:00 p.m.

Humanities Institute Faculty Colloquium Series, "Mixing Black and White: Historical Attitudes on Interracial Marriage," Tilden Edelstein, provost. 4:30 p.m., Room E-4341, Melville Library. Call 632-7765.

Italian Studies Center Film, "Garden of the Finzi-Continis." In Italian with English subtitles. 7:30 p.m., Rosebud Theatre, Staller Center for the Arts. Call 632-7444.

Polity Senate. 7:30 p.m., Union Bi-Level. Every Wednesday.

The Stony Brook Gaming Club. 8:00 p.m., Commuter College, SB Union. Every Wednesday.

Student Activities Board. 9:00 p.m., Room 231-A, SB Union. Every Wednesday.

THURSDAY APRIL 19

Fraternity/Sorority Weekend. Call 632-6700. Through April 22.

Distinguished Corporate Scientist Lecture Series, "An Overview of Biotechnology in Agriculture," Clifton Baile, Monsanto Co. Noon, Lecture Hall 6, Level 3, Health Sciences Center. Call 632-8521.

Physical Chemistry Seminar, "Charge Transfer Processes in the Cluster Regime," Mark Johnson, Yale University. Noon, Room 412, Chemistry.

The Wellness Program, "Stress Management." Determine the best individual strategies for coping with stress. Open to USB faculty and staff. Noon - 1:00 p.m., EAP Office, 105 Nassau Hall.

The Group Shop Workshop, "Finding the Right Position: Tips for Your Job Search." Sponsored by the University Counseling Center. 3:00 - 4:30 p.m. Open to all USB students, faculty and staff.

Men's Tennis vs. New York Tech, 3:30 p.m.

Organic Chemistry Seminar, "Determinants of Nucleic Acid Reactivity," Steven Rokita, assistant professor of chemistry. 4:00 p.m., Room 412, Chemistry.

Philosophy Spring Colloquium Series, "Reporting Experiments," Robert Ackerman, University of Massachusetts. 4:15 p.m., Room 214, Harriman Hall.

Occult Studies Group. 7:00 p.m., Room 214, SB Union. Every Thursday.

Poetry Reading, Ray Freed, Spring 1990 poet-in-residence. 7:30 p.m., Room 239, Humanities. Call 632-7373.

Inter Varsity Christian Fellowship. 7:30 - 9:00 p.m., Room 237, SB Union. Every Thursday.

Lesbian, Gay, Bisexual Alliance. 9:00 p.m., Room 231, SB Union. Every Thursday.

Ballroom Dancing Party, sponsored by the Vietnamese Students Association. 10:00 p.m. - 2:00 a.m., SB Union Bi-Level. Part of Asia Month.

FRIDAY APRIL 20

G-Fest. Events include wacky olympics, a pit hockey tournament, battle of the bands and barbecue lunch. Call 632-6760. Through April 22.

School of Continuing Education Course, "Real Estate Financing." Two-day course. This 15-hour module will guide students through the maze of today's complex mortgage scene. The course fee is $99. 9:00 a.m. - 5:30 p.m. on the USB campus. Call 632-7071. Through April 21.

Women's Softball vs. William Paterson College, 3:00 p.m.

Chemistry Seminar, "Mannich Magic," C.H. Heathcock, University of California, Berkeley. 4:00 p.m., Room C-116, Old Chemistry.

Physiology and Biophysics Seminar Series, "G_o-Protein and Regulation of Oocyte Function," Ravi Iyengar, Mt. Sinai School of Medicine. 4:00 p.m., Room 140, Level T-5, Basic Health Sciences Tower.

COCA Film, "An Innocent Man." 7:00 and 9:30 p.m. and midnight, Jacob K. Javits Lecture Center. Tickets are $1.50, $1 for USB students. Through April 22.

Non-Instructional Figure Drawing. Practice from a live model. $4 fee at the door. 7:30 - 9:30 p.m., SB Union Crafts Center. Call 632-6822.

Student Polity Concert, The Mighty Lemon Drops. New music from England. Tickets are $12; $10 for students at the door, $8 in advance. Tickets are available at the Union Box Office and at Ticketmaster locations. 8:00 p.m., SB Union Ballroom. Call 632-6464.

SATURDAY APRIL 21

School of Continuing Education Course, "Using PageMaker." First of six sessions. A program appropriate for anyone who designs brochures, newsletters, pamphlets or catalogues for personal or business use. Meets Saturdays, 10:00 a.m. - noon until May 26. Call 632-7071.

The Patriots take on the Air Force Academy Sunday, April 22 at 1:30 p.m.

Men's Baseball vs. City College of New York, noon.

Women's Softball vs. SUNY Binghamton, noon.

Staller Center Dance Series, the Toronto Dance Theatre. This Canadian troupe celebrates its 20th anniversary. Tickets are $20, $18, $16; $10, $9, $8 USB students. 8:00 p.m., Main Stage, Staller Center for the Arts. Call 632-7230.

China Weekend. Includes a culture show on Friday night and a talent show followed by a party on Saturday. The culture show begins at 8:00 p.m. in the SB Union Ballroom; the talent show and party begin at 8:00 p.m.in the SB Union Ballroom. Part of Asia Month. Through April 22.

SUNDAY APRIL 22

Earth Day Event, "The Greenhouse Effect and Global Change." Lectures, videos and panel discussions will take place from 12:30 - 5:00 p.m. at the Jacob K. Javits Lecture Center. An information table with pamphlets and a reading list will be available. Admission is free. Sponsored by the Stony Brook Collegium's Global Change Study Group in collaboration with the Marine Sciences Research Center, the Institute for Terrestrial and Planetary Atmospheres and the Museum of Long Island Natural Sciences. Call 632-8230.

Men's Lacrosse vs. Air Force Academy, 1:30 p.m.

MONDAY APRIL 23

School of Continuing Education Seminar, "Increasing Supervisory Effectiveness." Topics will include dealing with the challenges involved in making the transition from worker to supervisor. Seating is limited. Call 632-7071 for time. Through April 24.

Lecture, "An Analysis of Risk Factors and Hospital Mortality Rates for Adult Open Heart Surgery Patients in New York State," Edward L. Hannan, New York State Department of Health. 2:00 p.m., Room 104, Harriman Hall.

Microbiology Seminar, "T Antigen Transgenic Mice: A Model System for Cell Proliferation *in Vivo*," Terry Van Dyke, University of Pittsburgh. 4:00 p.m., Room 038, Life Sciences.

TUESDAY APRIL 24

All-In-1 Demonstration, "Kermit - File Transfer," assisting intermediate users in file conversion and transfer. 10:00 a.m. - noon. Call 632-7795.

Microbiology Seminar, "Site Specific Integration by Adeno-Associated Virus into Human Chromosomes," Richard J. Samulski, University of Pittsburgh. 1:00 p.m., Room 038, Life Sciences.

The Mentor Program, "Rite of Passage," end-of-the-year ceremony. 3:00 - 5:00 p.m., University Club, Chemistry.

Men's Tennis vs. CUNY College of Staten Island, 4:00 p.m.

WEDNESDAY APRIL 25

Cultural Fest. Events include cultural movies; a Stony Brook world's fair in the SB Union; a "Taste of the World" on the Staller Center Plaza; the Asian Students Association Fashion Show and Caribbean Day. Call 632-6823. Through April 27.

The Group Shop Workshop, "Stress Management: Relaxing the Body." A beginning workshop to increase awareness about the effect of stress on the body and to learn specific relaxation techniques. Sponsored by the University Counseling Center. Noon - 1:30 p.m. Open to all USB students, faculty and staff.

Biotech Job Fair. Open to graduating seniors, graduate students and post doctoral students at Long Island universities. Scientific and personnel representatives from New York State companies to discuss their work and meet prospective candidates for employment. 1:00 - 3:30 p.m., Alliance Room, Melville Library.

Men's Baseball vs. U.S. Merchant Marine Academy, 3:30 p.m.

Ecology and Evolution Seminar, "The Evolution of Pelagic Larval Development in Marine Invertebrates," Larry McEdward, University of Florida. 3:30 p.m., Room 038, Life Sciences.

Men's Tennis vs. St. John's University, 4:00 p.m.

Women's Softball vs. CUNY Lehman College, 4:00 p.m.

Faculty Intructional Support Workshop, "Student Evaluations of Teaching." Workshop is open to all new faculty less than four years on campus. 4:00 p.m., Room 211, Old Chemistry. Call 632-8356.

Humanities Institute Resident Fellow Lecture, "Popular Culture/High Culture: The Politics of an Old Debate," Diane Pacom, University of Ottawa. 4:30 p.m., Room E-4340, Melville Library. Call 632-7765.

School of Continuing Education Course, "Introduction to the Use of PCs." First of six sessions. An introduction to the use of the personal computer at home or on the job; no prior knowledge or experience necessary. Course meets April 25, May 2, 9, 16, 23, 30 from 5:30 - 7:30 p.m. on the USB campus. Call 632-7071.

Contemporary Music Series, "Six American Premieres." Featuring specially commissioned works by Winslow, Primosch, Moevs, Sollberger, Moe and Mamlok. This concert is the preview of the concert to be performed Sunday, April 29 at 8:00 p.m. at Merkin Hall in New York City. Tickets are $5, $3 USB students and senior citizens. 8:00 p.m., Recital Hall, Staller Center for the Arts. Call 632-7230.

Library Staff Association
Book Sale, April 18 - 19,
10:00 a.m. - 3:00 p.m.
in the Gift Book Room,
Melville Library.
Call 632-7110.

THURSDAY APRIL 26

Fraternity/Sorority Workshop, panel discussion. Call 632-6700 for time and location.

Faculty/Staff Blood Drive. Sponsored by the Office of Human Resources and Long Island Blood Services. 8:30 a.m. - 1:30 p.m., SB Gymnasium.

Career Women's Network Luncheon, "Returning to Learning." Three speakers will discuss issues facing adults who return to school. $6.50 admission includes lunch. Noon, End of the Bridge, SB Union. Call 632-6040.

The Wellness Program, "Stress Management." Will help determine the best individual strategies for coping with stress. Open to USB faculty and staff. Noon - 1:00 p.m., EAP Office, 105 Nassau Hall.

Women's Softball vs. CUNY Hunter College, 3:30 p.m.

Organic Chemistry Seminar, "Heterocyclic Synthesis via Ring Transformation of Oxazoles," I. Turchi, BOC Group. 4:00 p.m., Room 412, Chemistry.

Association for Women in Science Long Island Chapter Lecture, "Understanding the Greenhouse Effect," Inez Fung, Goddard Institute for Space Studies, NASA. 7:30 p.m., Javits Room, Melville Library. Call 282-2139.

FRIDAY APRIL 27

Campus Clean Up, 9:30 a.m. - 3:00 p.m. An annual event; students, faculty and staff help clean, paint and beautify the campus. Reception following at 3:00 p.m., First Floor Lobby, Administration. Call 632-6320.

COCA Film, "Steel Magnolias." 7:00 and 9:30 p.m. and midnight, Jacob K. Javits Lecture Center. Tickets are $1.50, $1 for USB students. Through April 29.

Roth Quad Yacht Club Regatta. 3:30 p.m., Roth Pond.

Men's Baseball vs. Dowling College, 4:00 p.m.

Non-Instructional Figure Drawing. Practice from a live model. $4 fee at the door. 7:30 - 9:30 p.m., SB Union Crafts Center. Call 632-6822.

SATURDAY APRIL 28

Men's Tennis at U.S. Merchant Marine Academy, 2:00 p.m.

Student Polity Concert, The Psychedelic Furs. The new music band's work includes "Pretty in Pink." Tickets are $12 for non-students, $10 for students in advance, $15 at the door. Tickets are available at the Union Box Office and at all Ticketmaster locations. 8:00 p.m., SB Gymnasium. Call 632-6464.

SUNDAY APRIL 29

Oozeball '90. Volleyball in the mud. 9:00 a.m. - 5:00 p.m., Roosevelt Quad. Sponsored by the Student Alumni Chapter. Call 632-6330.

Men's and Women's Outdoor Track host the Stony Brook Invitational, 10:00 a.m.

Italian Studies Center Brunch Lecture, "Italian Wine and Food after the California Earthquake," Thomas Maresca, professor of English. The menu includes miniature green omelets and broiled mushroom caps with veal and pesto, and is based on the cookbook *La Tavola Italiana*, by Maresca and Diane Darrow. Tickets are $15 and reservations are required. Noon, University Club, Chemistry. Call 632-7444.

Radiothon '90 Concert. A special benefit concert for WUSB 90.1 FM with critically acclaimed Austin-based band Poi Dog Pondering. Call 632-6500.

MONDAY APRIL 30

Men's Baseball vs. SUNY College at Old Westbury, 3:30 p.m.

Men's Tennis vs. SUNY College at Old Westbury, 3:30 p.m.

Humanities Institute Film Series, North American Women Directors, five short pieces by African American women filmmakers. "Remembering Thelma," directed by Kathe Sandler; "Hairpiece," directed by Ayoka Chinzera; "Illusions," directed by Julie Dash; "Cycles," directed by Zeinabu Davis and "Picking Tribes," directed by Saundra Sharp. Co-sponsored by the Humanities Institute, the Greater Port Jefferson Arts Council, the Port Jefferson Village Cinema and Theatre Three. Tickets are $3. 8:00 p.m., Theatre Three, 412 Main Street, Port Jefferson. Call 632-7765.

ART EXHIBITS

April 16-18: Group Exhibition, "Prints by Print Makers." A group exhibition including 90 etchings, lithographs, dry points, woodcuts and engravings by 20th-century American print makers. Noon - 4:00 p.m., Tuesday through Saturday. University Art Gallery, Staller Center for the Arts. Call 632-7240.

April 16-24: Exhibition, "Edward Bridges: Landscape Photographs." Local photographer and Union Crafts Center instructor show includes photographs concerned with ecology and the environment, depicting suburban areas that have been designed, composed and developed. Noon - 5:00 p.m., SB Union Art Gallery. Call 632-6822.

April 26-27: Exhibition, "CHALI: Contemporary Hispanic Artists of Long Island, Inc." Part of Cultural Fest, co-sponsored by the Latin American Students Association. Noon - 5:00 p.m., SB Union Art Gallery. Call 632-6822.

April 30-May 11: Student Exhibition. Featuring sculpture by students of Molly Mason, assistant professor of art. Noon - 5:00 p.m., SB Union Art Gallery. Call 632-6822.

For additional information on frequent Stony Brook programs, call:

The Group Workshop: 632-6720
Staller Center Box Office: 632-7230
Union Crafts Center: 632-6822
The Wellness Program: 632-6136
The Voice of Student Activities: 632-6821

Events Listing

To be included in the calendar, events must be submitted to the calendar editor at least three weeks in advance of the publication date. Listings for the May issue of Currents *must be received by April 10.*

We remind all event sponsors that arrangements for parking should be made with Herbert Petty, assistant director for parking and enforcement, 632-6350.

Telefund Appeal Underway

Over the next several weeks, the Telefund, a new program organized by the Stony Brook Foundation, will be turning to alumni, parents, faculty and staff to solicit donations for Stony Brook's Annual Fund.

Donations of any amount can be designated at the donor's request. Unrestricted gifts will be used at the discretion of President John Marburger to support programs underfunded by the state or new initiatives developed by students, faculty and staff.

Donations may also be earmarked for the Scholarship Fund, and can be designated for either merit-based or need-based scholarships. A recent report issued by the Tucker Committee of the University Senate identified scholarships as a top priority to improve the quality of undergraduate education at Stony Brook.

Payroll deductions simplify faculty and staff giving. For less than $20 a week, one can support a $1,000 scholarship and become a Stony Brook Associate.

Beth Hayes is coordinating the Telefund program. For more information, call 632-6300.

S.A.I.N.T.S. Scholarship Drive

The Scholastic Achievement Incentives for Non-Traditional Students (S.A.I.N.T.S.) program is sponsoring its 15th Annual Scholarship Fund Drive this semester. The continued success of the drive is due in large part to faculty and staff contributions, which have totaled more than $2,300 annually.

Each spring, the organization presents 12 awards to traditionally underrepresented students who either have excelled in their studies, been accepted into a graduate program, or contributed in the area of community service. This year's awards dinner will be held May 4.

Donations should made out to S.A.I.N.T.S. Scholarship Program/Stony Brook Foundation Account 066310 and forwarded to Judy Berhannan, Office of Undergraduate Admissions 125 Administration, or Lucia Rusty, Office of Special Programs, W-3520 Melville Library.

AIDS Peer Educator Program

In an effort to educate college students about the threat of AIDS, the Division of Campus Residences has formed the AIDS Peer Educator program to provide campus residents accurate information about the disease and address issues of behavior modification.

Under the direction of Dallas Bauman, assistant vice president for campus residences, 25 resident assistants have been selected to organize educational programs in residence halls. Peer coun-selors meet with students in small groups or on a one-on-one basis, rather than lecturing to large groups.

For more information on the program, contact Lee Brossoit, Eleanor Roosevelt Quad director, at 632-6775.

Undergraduate Excellence Ceremony to Be Held April 17

Students and faculty will be recognized at the Eighth Annual Ceremony for Undergraduate Excellence April 17.

The award acknowledges undergraduate accomplishments in areas including community service, the performing and visual arts, athletics, research and student government. Nominees, recommended by fellow students, faculty or staff were selected by the Undergraduate Excellence Selection Committee. Less than one percent of the undergraduate population receive a Certificate of Excellence.

In addition, the six recipients of the President's Award for Excellence in Teaching will be recognized by President John Marburger. The ceremony begins at 5:00 p.m. on the Main Stage in the Staller Center for the Arts.

This year's Undergraduate Excellence Award winners and their academic majors are: Sorin Abraham, sociology; Roland Allnach, medical technology; Thomas Amadio, economics; Arlene Anderson, social welfare; Rowena Aquino, sociology; Jennifer Banta, theatre arts; James Bardwell, sociology; Sheldon Bassarath, English; Deirdre Belle-Oudry, chemistry; Janet Benson, economics; Anna Bentsianov, biology and Russian; Shahin Bina, biochemistry; Joseph Boglia, physical therapy; Arthur Bozza, general studies; Rajinder Bridgelall, electrical engineering; Robert Burden, liberal studies.

Also, Dale Coffin, liberal studies; Cirstin Connors, history and English; Ross DeLaCruz, history; Veronica DiFresco, math; Maxine Douglas, political science and philosophy; Daniel Downs, physics; John Eng, mechanical engineering; Donnah Facey, nursing; Bernadette Francino, sociology; Kimberly Fredenburgh, physics; Yves Gabriel, biochemistry; Harold Gaynes, sociology; Craig Gerken, chemistry; Nadine Goldberg, social sciences interdisciplinary; Lisa Granados, liberal studies.

Also, Kenneth Gullo, electrical engineering; Morey Haber, electrical engineering; Catherine Hustedt, psychology; Tri Minh Huynh, electrical engineering; Barbara Indilla, nursing; Dale Joseph, sociology; Irina Kats, math; Jeffrey Kenney, engineering chemistry; Keri Larkin-Vita, cardiorespiratory sciences; Esther Lastique, history and social sciences interdisciplinary; Sarah Lenchner, general studies; Hsin-Chun Liao, electrical engineering; John Liuzzo, biochemistry; Dawn Ludwin, French.

Also, Brian Mandel, psychology; Erin McCabe, liberal studies; Isaac Namdar, biochemistry; Mary Nguyen, economics and business; Jennifer O'Brien, history; Cedric Olivera, biology; Kimberly Pollock, applied mathematics and statistics; Rebecca Reimann, medical technology; David Rose, Italian; Stephanie Rothman, biochemistry; Albert Samadi, biochemistry; Richard Seeley, liberal studies; Vivakanand Sewrathan, engineering science; Lisa Shaffer, liberal studies.

Also, Amelia Sheldon, English; Julie Shor, computer science; Dina Simoes, French; Daniel Slepian, English; Emeka Smith, general studies; Jacqueline Spencer, cardiorespiratory sciences; Michelle Stephen, English; Leslie Tiedeman, music; Angela Tu, psychology; Ling Chih Tu, computer science and electrical engineering; Brian Waldbaum, biochemistry; Karen Wood, theatre arts.

Organ Donor Awareness Week

April 22-28 has been designated National Organ Donor Awareness Week. The present organ donor shortage is a critical problem locally and nationally.

University Hospital houses the only transplant facility on Long Island. From its inception in 1979, the transplantation service has developed a very successful kidney transplant program.

President Marburger encourages university members to see the organ donor display located in University Hospital's main lobby.

Library Internships, Fellowships

Stony Brook libraries are offering paid undergraduate internships and graduate fellowships to students from traditionally underrepresented populations pursuing careers in library and information science.

Candidates must be in their junior year of study. Those selected work 10 hours a week in a main campus library. Upon graduation, students receive a graduate fellowship to the School of Information Science and Policy at SUNY Albany.

Application deadline in April 30. For information, call 632-7100.

Campus Vehicle Registration

All Stony Brook faculty and staff will have until May 15 to register their cars for campus parking. Each faculty/staff member is permitted to register two vehicles at a cost of $5 per car.

For more information, contact Herbert Petty, associate director of parking and transportation, 632-6350.

Spring Blood Drive Scheduled for April 26

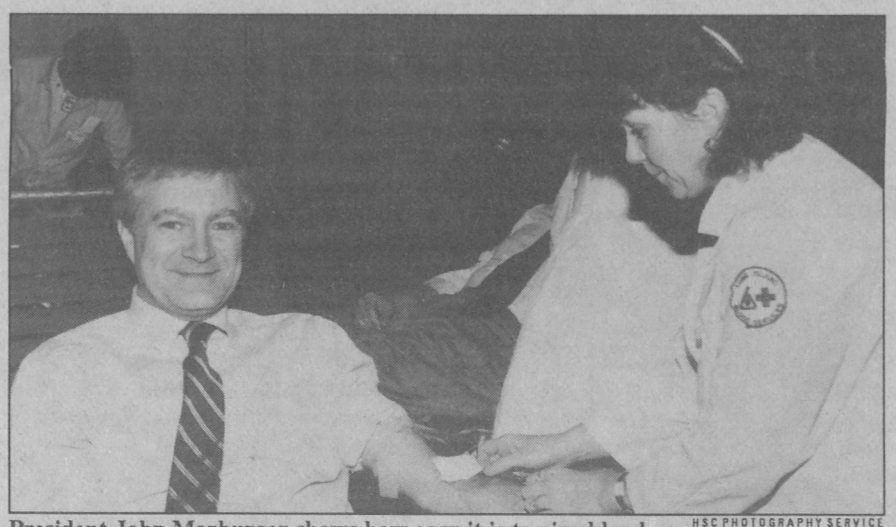
A drawing for free on-campus luncheons will be given away to encourage faculty, staff, alumni and graduate students employed on campus to sign up for the annual spring blood drive, scheduled for April 26. The drive will be held from 8:30 a.m. to 1:30 p.m. in the Stony Brook Gymnasium.

Long Islanders needs 900 pints of blood a day. Each pint can be used by several patients, since the blood is often separated into its component parts. "Stony Brook's main campus has over 3,500 employees. If we all donate, our contributions will make a big difference," says Valerie Lusting, fringe benefits manager, who is coordinating this years blood drive.

Donating blood takes a little more than hour. Donors should eat before coming, and donors must be between the ages of 17 and 65 (those over 65 must have their doctor's permission) and weigh at least 110 pounds.

To schedule an appointment, call 632-6150 or contact one of the following blood drive captains:

Accounting	Jennifer Chin
Accounts Payable	Joan Jaeger
Admissions	Edwina Osmanski
Africana Studies	Linda Martin
AIM	Alfreda James
Anthropology	Janet Masullo
Applied Mathematics	Claire Dugan
Arts & Sciences	Karl Demuth
Art	George Koras
Auxiliary Services	Pauline Yellon
Biochemistry	Janet Koenig
Budget	Joan Rinaldi
Bursar	Janet Meckley
Career Development	Peggy Infantino
CED	Linda Hoffman
Central Receiving	Kathy Leeman
Chemistry	Scott Sieburth
Comparative Literature	Lee Peters
Computer Science	Kathy Germana

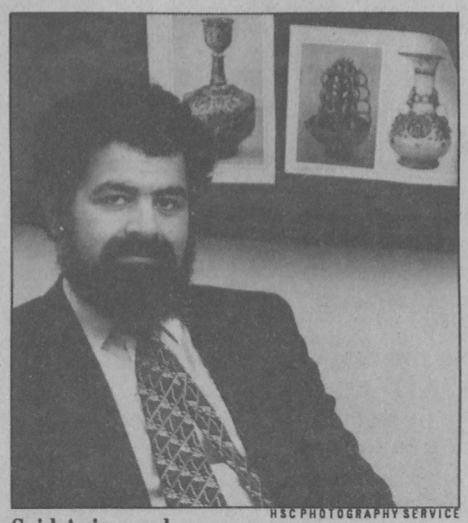


HSC PHOTOGRAPHY SERVICE

President John Marburger shows how easy it is to give blood.

Computing Center	Mary Keenan
Computing Services	Mario Simat
Custodial	R. Gorman
Disabled Student Services	M. Boccafola
Earth & Space Science	Iris Roth
Economics	Lynda Perdomo Ayala
Educational Com.	Vivian Ortiz
Electrical Engineering	Virginia Donahue
Eng. & Applied Science	Nancy Davies
English	Claire Logan
Envi. Health & Safety	Ed O'Connell
Facilities Engineering	Charles McAteer
Financial Aid	Carole Adelman
Fine Arts Center	Judith Anderson
French, Italian & Hispanic	Gale McHale
German & Slavic Lang.	Pat O'Brien
Graduate School	Jenny Hardina
History	Diane Bello
Human Resources	N. Hutchinson
Inst. for Plant Atmos.	Bernice Wornow
Institutional Services	Harriet Pearlstein
Institutional Studies	Sue Fijalkowski
Internal Audit	Kathryn Larsen
International Programs	Selester T. Linares
Library	Audrey Koppos
Marine Science	William Wise
Materials Science & Eng.	Joan Pidot
Mathematics	Lucille Meci
Mechanical Engineering	Jane Garon
Microbiology	Jean Altwein
Music	Terri Berndt
Neurobiology & Behavior	Pam Mackey
OASIS	Ray Auletta
Payroll	Ellen Lindgren
Physical Education	Norman Berhanan
Physical Plant	Linda Wuss
Physics	Francine Schultz
Polity	Mary Shear
President's Office	Carol Furman
Printing	Elaine Elderkin
Provost	McCormick
Psychology	Beverly Rivera
Public Safety	Neil Sluiter
Purchasing	Judy Friedlander
Records/Registrar	Barbara DeMartini
Research Services	Rita Burke
Residence Halls	Alice Martin
Social Science	Frances Randall
Sociology	Judith Thompson
Student Accounts	Bill Kuzmack
Student Affairs	Elvira Vanderpool
Student Health Service	John Brady
Student Union Activities	Maryanne Picoult
Theatre Arts	Helen Traina
Undergraduate Studies	Marilyn Strange
University Affairs	Barbara Grannis
University Counseling	Barbara Oliva
V.P. for Campus Finance	Sarah Fornadel
V.P. for Campus Services	Diane Hernandez

KUDOS


HSC PHOTOGRAPHY SERVICE

Said Arjomand

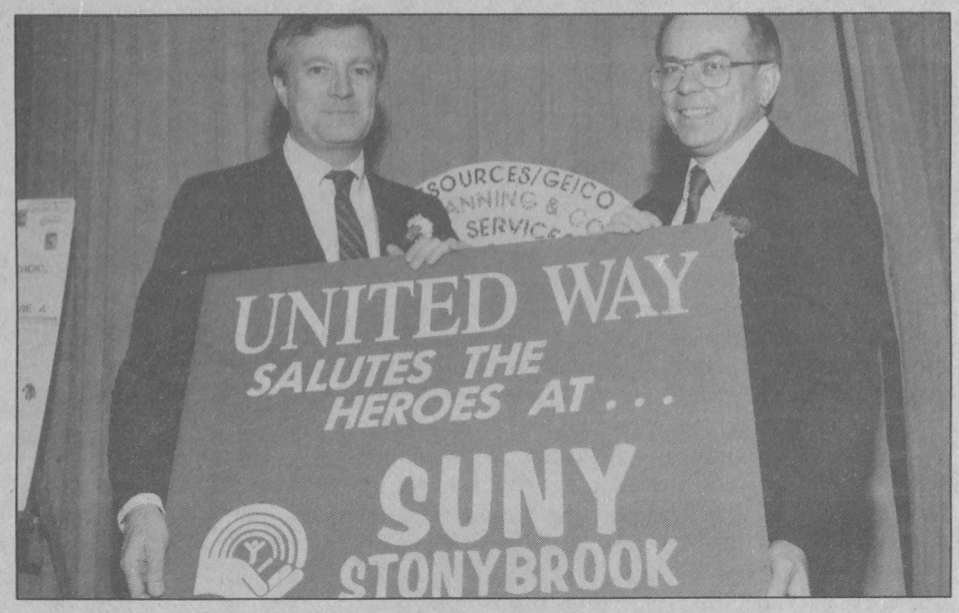
Said Arjomand, professor of sociology, has been invited to deliver the keynote address for the opening of the Institute for Comparative Studies in Development and Cultural Change at the University of Nijmegen, the Netherlands. His lecture, "Constitutions and Constitution Making in Modern Iran" will be part of the new research center's dedication ceremony Sept. 22. Arjomand was also invited to join the American Sociological Association's liaison committee to coordinate the work of sociologists around the world.

Frederick Preston, vice president for student affairs, has recently returned from Israel where he was one of 12 leading African-American educators on a fact-finding visit sponsored by the American Jewish Committee and the Israeli goverment. The trip included meetings with both Israeli and Palestinian leaders.

Felix Rapaport, professor and chair of the Department of Surgery and chief of the transplantation service, has been selected as one of three recipients of the 1990 Solomon A. Berson Medical Alumni Achievement Award presented by New York University's School of Medicine Alumni Association. Dr. Rapaport, whose career began at NYU, is a leading force in the field of transplantation. His pioneering studies of skin homograft rejection led to collaboration with Jean Dausset. That work culminated in the discovery and characterization of the human leukocyte antigen (HLA) system and provided the scientific foundation for organ transplantation in humans.

Frederick Grine, associate professor of anthropology, and **Lawrence Martin**, assistant professor of anthropology, received a three-year, $281,000 National Science Foundation grant investigate the incremental development of enamel and dental micro structure in hominids, apes and humans.

Mae Hultin, associate professor of medicine in the Division of Hematology, will be honored for her research on cardiovascular disease, at the American Heart Association's fashion show Thursday, April 19 at the Smithtown Sheraton Hotel in Hauppauge. Hultin received a three-year, $30,000 grant from the New York State affiliate of the American Heart Association to study whether a normal blood protein called Factor 7 may be a risk factor for heart disease. Previous studies suggest a tie between cardiovascular disease and high levels of the protein.



United Way Recognizes Stony Brook Employees
At United Way of Long Island's recent Volunteer Recognition Luncheon, Stony Brook employees were recognized for their support of the 1989 State Employees Federated Appeal (SEFA). The university led this year's campaign with employee contributions totaling a record $79,317. Jack Sage (right), president of United Way of Long Island, congratulates President John Marburger, who chaired the SEFA campaign.

TRANSITIONS

Eve Finkelstein, formerly a purchasing associate for Graphic Support Services, has been named assistant registrar for scheduling. Finkelstein, who served as purchasing associate since 1987, replaces Betty Becktel who retired Feb. 15.

Diane Fabel has been appointed assistant director of the Center for Biotechnology. A member of the board of directors of the Seattle-based Gulf American Financial Services, a "start-up" financial services firm, Fabel has several years experience in commercial real estate development and has been active in local economic development issues.


KEN WISHNIA

Student Play Premieres at Fanny Brice Theatre
"Understand Me," an all undergraduate production of an original play, debuted recently at the Fanny Brice Theatre in Eleanor Roosevelt Quad. The production, sponsored by Stony Brook's Undergraduate Research and Creative Activities Program (URECA), addresses the issue of abortion. The cast includes, from left, Jennifer Porciello, Nicholas Kiriazis, Simone Pero, Erika-Lee Lewis (playwright), Mia Russow, James Simons (URECA sponsor), Marilyn Hawrys Simons '74 G'84, Marylou Meagher (director) and Joy Fleising.

BRIEFINGS

Grants

Joseph Cavanagh, library systems planning officer, received $2,580 from the UUP/New York State New Professional Study Leave Awards to complete requirements for a Master of Arts degree.

Eleanor Kra, assistant to the dean at the Health Sciences Center, received $500 from the UUP/New York State New Professional Study Leave Awards to revise and update a personnel and operations manual she wrote for secretaries in the School of Allied Health Professions.

Peter Henderson, associate professor of computer science, was awarded a $9,300 Special Purpose Grant in Science and Engineering from the AT&T Foundation to support the development of a laboratory for the introductory computer science course, "Foundations of Computer Science."

Presentations

Mel Pekarsky, professor of art, had his work exhibited at the Butler Institute of American Art in Youngstown, OH from Feb. 4 to March 18.

Publications

Anita Moskowitz, associate professor of art, contributed the essays concerning Italian Gothic works in *Census of Gothic Sculpture in America: New England Collections*, edited by Dorothy Gillerman (Garland Press, New York, 1989).

Stony Brook in the News

Roxanna Herrick, head of the Department of Preservation, was the subject of the article "Old Friends, Bookends," which appeared in *The New York Times* Feb. 11 and "'Book Doctor' Turns a Page," which appeared in *Newsday* Feb. 11. Herrick spoke on the book preservation clinic at Stony Brook and the wealth of documents in need of preservation on Long Island.

Israel Kleinberg, chair of the Department of Oral Biology and Pathology, was interviewed in the article "Saliva's Role in Disease," which appeared in *Newsday* Feb. 27. He discussed saliva's role in preventing tooth and gum decay. Kleinberg was also noted in the article "The Changing Face of Dentistry," which appeared in *Newsday* Feb. 27. He discussed the plans of several universities to close their dental schools.

Richard Levin, professor of English, was the subject of the article "A Traditionalist Takes on Feminists Over Shakespeare," which appeared in *The New York Times* March 1. Levin's views challenge feminist readings of Shakespeare, arguing that the plays are about individuals making fateful and fatal errors as they confront such issues as ambition, greed, vengeance, vanity and jealousy.

Tony Phillips, professor of mathematics, was the subject of the article "Knotty Questions," which appeared in *The New York Times* March 4. Philips is exploring the graphic representation of knot theory with artist Pam Davis.

OBITUARIES

Evelyn Bonner, who served as administrative assistant to the chair of the Department of Biochemistry from 1974 to 1984, died March 11 of cancer. She was 70. She is survived by her husband, Francis T. Bonner, a professor of chemistry at Stony Brook; a son, Michael; and a daughter, Rachel.

A fund has been established in her memory. Contributions may be sent to the Evelyn Bonner Fellowship Fund in care of the Department of Biochemistry.

Roger Brett, clinical assistant professor of anesthesiology, died March 13 of cancer in Boston. He was 42.

In addition to his teaching duties, Dr. Brett was also involved in federally funded research on neurotransmitters. He is survived by his wife, Claire Mettewie; a son, William Noah; and his mother, Doris.

Will the Paperwork Bury Research?

by Robert F. Schneider

Since 1970, federal funding of research and scholarly effort at U.S. universities hasincreased significantly. Unfortunately, this increase in support is accompanied by an increase in bureaucratic requirements for the use of these funds.

This change reflects a shift in university-federal relations. It has also infected relations between universities and many of their private sponsors. Earlier distinctions between assistance (grants, with accountability requirements that focused primarily on productivity) and procurement (contracts in which all applicable expectations, requirements, and certifications are specified in advance), has virtually vanished.

One can only speculate on the origins of this steady and continuing bureaucratization of sponsored support. Does it reflect mistrust of universities by the public? Is it a continuing lowering of the priority of higher education in general? Is it a result of the democratization of the academy? Ironically, large private contractors, some with expenditures of public funds often larger than those expended by universities, are often less constrained in their expenditure of federal funds. Yet, the magnitude of commercial sector audit resolutions in some notable instances exceeds the entire federal funding of a major research university.

Individual entrepeneurs

Research in a university environment such as Stony Brook's is best characterized as the equivalent of one thousand or more relatively small, high-technology consulting businesses. Individual faculty entrepreneurs prepare the proposals that solicit support of their research and creative activities. Once awarded, the entrepreneurs attempt to manage their own personnel, equipment, supplies, service and travel needs, within the different requirements of many sponsors. Some sponsors constrain personnel expenditures. Others prohibit the purchase of some or all types of equipment or constrain travel. Still others require preapproval of any changes in proposed expenditures.

Perhaps the most frustrating feature of sponsored project support is the existence of precise dates between which all project activities are required to be conducted. Such dates bear little relationship to the needs of the projects themselves. They derive primarily from the sponsor fiscal year concerns. The uncertainties that characterize seminal research projects are forced to fit time scales that are irrelevant to their progress.

Robert F. Schneider is associate vice provost for research. He also serves as campus manager for the Research Foundation of the State University of New York.

The Bureaucratic Accretion Accompanying Federal Funds

Technical audits have generally been replaced by financial audits. For sponsored projects, such audits generally pay little or no attention to individual project activities. They are institutional-statistical audits. The findings from the study of a small sample are extrapolated to the institutional standards and controls in addition to individual sponsor requirements. They pay no attention to measures of productivity, even though continuing support of the research entrepreneurs depends exclusively on their productivity. Further, the post-audits that once scrutinized what had been done have been replaced by a variety of pre-audit requirements.

Reviews and approvals

For example, to ensure eligibility to conduct sponsored projects, a university must now certify on behalf of itself and its individual faculty—in advance of funding—the review and approval of:

- human subjects involvement;
- use of laboratory animals;
- use of recombinant DNA or biological "hazards;"
- unavailability of major equipment;
- nondebarment of the institution;
- nondelinquency of the investigator;
- controls on drugs in the workplace;
- status of inventions;
- institutional resource availability.

That's not to mention impact on endangered species, marine mammals, pollution control, historical sites, international cooperative activity, other current support to the investigation and conflict of interest.

Grantee organizations (such as the Research Foundation for SUNY faculty) must certify compliance with regulations that govern human subjects review, laboratory animal review, recombinant DNA review, Affirmative Action requirements, persons with disabilities, sex discrimination, scientific fraud and the National Environmental Policy Act.

As an additional burden, agencies have added rules regarding proposal formats, including page limitations in proposals and even font restrictions on electronically produced text.

All the above relate to proposals for funding. They do not include the immense number of (sometimes conflicting) regulations that govern the use of funds after an award is made: Regulations regarding personnel and employment, IRS regulations on payroll, exceptionally bureaucratic requirements regarding fringe benefits, extensive regulations on procurement, on property control, on travel, just to name a few.

The applicable federal circulars generally provide that the certifications and processes they require be applied uniformly by the institution, that is, the acceptance of federal funds is contingent on the existence of a uniformly applied certification or other required process. The institution is, of course, not obligated to comply with federal requirements if it agrees not to accept federal funds.

In particular, Circular A-21 (on cost principles for educational institutions) requires that the same accounting principles used by an institution for federal funds be applied to all its funds. Other circulars address administrative requirements in the management of federal funds (Circular A-110), and indirect costs (Circular A-88) and many more.

Private sector requirements

The private sector sponsors have been no less vigorous in expanding their requirements. Organizations like the American Cancer Society publish extensive documents summarizing requirements on the expenditure of their grant funds and other applicable requirements on projects they sponsor. The policies governing the Arthritis Foundation's Center Grants are found in a 12-page booklet, addressing such issues as expenditure constraints, ethical standards, ownership of materials, malpractice, and many other provisions. The American Heart Association's patent policy alone comprises four typewritten pages.

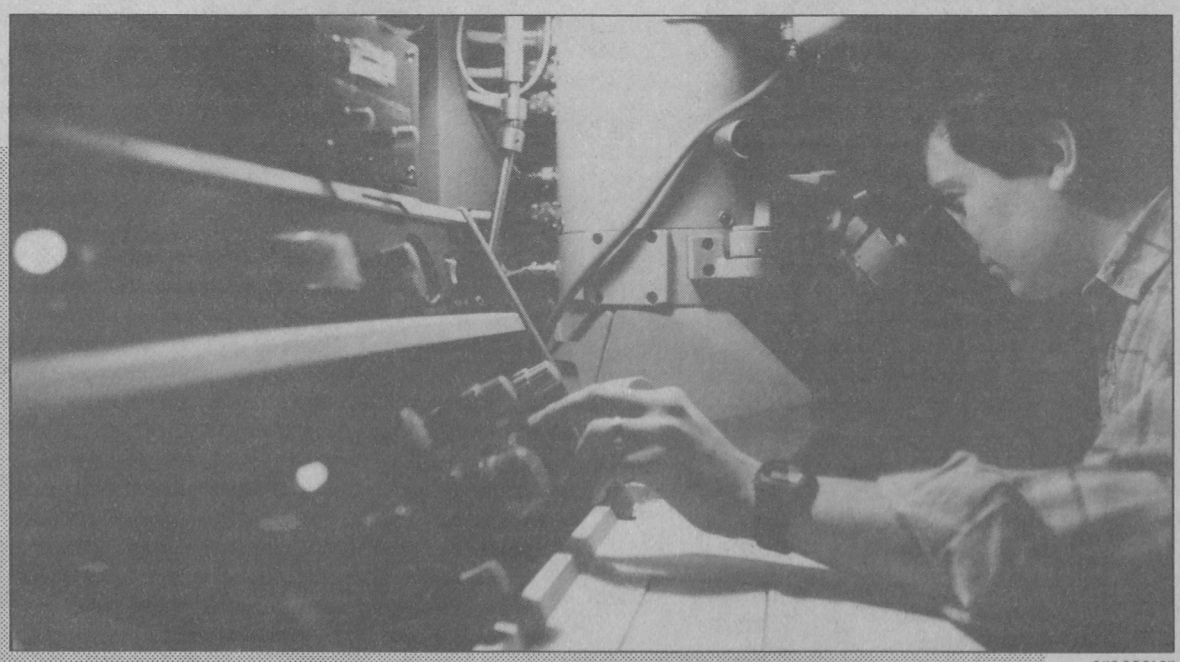
"Accountability has been pushed to the point of counterproductivity."

The files that constitute the policies and guidelines of the 1,000 or so private sponsors with which a campus like Stony Brook deals with fill over ten file cabinet drawers! The contracts executed with private sector agencies frequently require negotiations that take weeks, or even months, to resolve.

Universities have responded to this change in several ways. Financial affairs are now administered under generally accepted accounting principles. In other words, they are managed increasingly in a manner parallel to that of big businesses.

Some universities (Stony Brook among them) have sought to engage the federal establishment in programs to reverse the trend. Projects designed to restore the public trust and simultaneously enhance the environment for research have been proposed and implemented. The National Science Foundation grant simplification project, and it subsequent expansion to the Federal Demonstration Project, are examples of such initiatives.

There is mounting evidence that the increased bureaucratization is not cost-effective. The indirect costs associated with sponsored research at universities are growing faster than the corresponding direct costs. Compliance with regulations consumes an increasing part of the investigator's and the institution's time and effort. Accountability has been pushed to the point of counterproductivity. Both investigators and those who assist them in the administration and management of their project need to look forward to a restoration of the trust that existed between the federal agencies and universities when federal assistance programs in support of research at universities began.



SUE DOOLEY

Will research hours be sacrificed in order to satisfy the increasing bureaucratization of sponsored support?