AMP SUNY

Pathway to Success...

SPRING, 1998

- **SUNY AMP, in its second year of operation, builds on local strengths and encourages diversity as it continues to forge an alliance that serves the needs of students in urban, rural and suburban settings.**
- **SUNY AMP has a strong commitment to implementing the change necessary to achieve its goals through program innovation, the establishment of best practices and the integration of research and education.**

PARTICIPATING INSTITUTIONS:

BINGHAMTON REGION
University at Binghamton
Broome Community College
Tompkins Cortland Community College
Onondoga Community College
BUFFALO REGION
University at Buffalo
Buffalo State College
HUDSON VALLEY REGION
State College at New Paltz
University at Albany
Ulster County Community College
Dutchess Community College
Orange County Community College
Schenectady Community College
LONG ISLAND REGION
SUNY at Farmingdale
Nassau Community College
State College at Old Westbury
University at Stony Brook
Suffolk Community College

PROGRAM COMPONENTS:

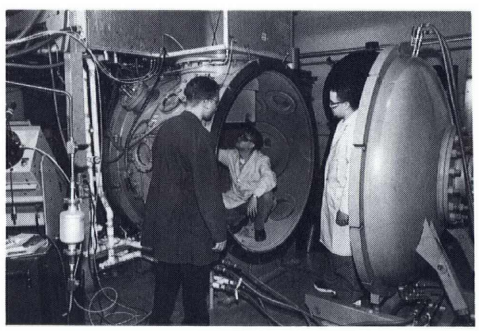
- Recruitment: high school to college, two-year to four-year transfers
- Retention
- Enrollment in Science, Math, Engineering, Technology (SMET) majors
- Research and internship placements
- Bridge Programs: high school to college, two-year to four-year
- Faculty advisement
- Success in gatekeeper courses
- Tutoring
- Mentoring
- Study groups and workshops
- Business and industry involvement
- Community and national organization involvement
- Increase in degree production in SMET majors
- Curriculum and pedagogical reform
- Institutionalization of AMP program elements

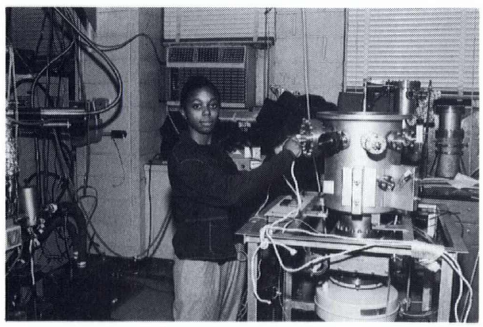
INDUSTRY INVOLVEMENT

SUNY AMP recipients of Computer Associates' Computer Science Scholarships with Charles Wang, CEO of Computer Associates, and David Ferguson, Project Director of SUNY AMP.

CURRICULAR AND PEDAGOGICAL CHANGE

SUNY AMP students and faculty in the high tech Thermal Spray Lab with equipment donated by GE and Pratt & Whitney.



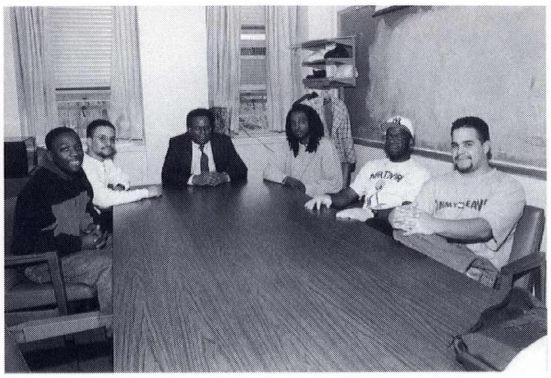


THE INTEGRATION OF RESEARCH AND EDUCATION

A SUNY AMP Materials Science student who is an NSF RAIRE (Recognition Award for the Integration of Research and Education) scholar.

THE SUNY AMP CHALLENGE

by David Ferguson, Project Director



In November 1996, a 16-campus collaboration, with headquarters at Stony Brook, received a $5 million grant from the National Science Foundation for a SUNY Alliance for Minority Participation (SUNY AMP). Over a five-year period, the project proposes to double the number of underrepresented minority students receiving bachelor degrees in science, mathematics, engineering and technology. A strong coalition is forging ahead on this ambitious goal. SUNY AMP is a collaboration between community colleges, four-year colleges, university centers, school systems, federal/state/local government agencies, Brookhaven National Laboratory, industry, private foundations and professional organizations.

The program builds on current programs that have been shown to be effective (for example, the Collegiate Science and Technology Entry Program, funded by the New York State Education Department) and forges new paths that involve students in research at colleges/universities and in internships in high-technology industries.

Now in its second year of operation, SUNY AMP has been able to make a strong start towards reaching its goals. Accomplishments include:

- A 12% increase in Science, Math, Engineering and Technology bachelor degree production
- A strong commitment to the integration of research and education as seen in participation in the NSF RAIRE program and system-wide student placements in cutting edge research facilities
- Substantial industry support, including an $833,000 five-year commitment by Computer Associates and internships and financial support from IBM, GE, Chrysler, Brookhaven National Laboratory, Praxair Chemistry, Northrop Grumman, RFS Cablesystems, Ingram Micro, Huck International, Merck Pharmaceuticals, and many others.

Continued on page 4...

REMARKS TO THE BOARDS OF GOVERNORS

SUNY PROVOST, Peter D. Salins

SUNY Provost Peter D. Salins highlights the accomplishments of the SUNY AMP program and affirms the support of the SUNY System Administration.

- I am pleased to welcome you, the members of the Board of Governors of the Alliance for Minority Participation. It is a special pleasure for the System Administration to be able to host you here at the State University Plaza, and an honor for me to participate in your meeting.
- I will keep my remarks brief. If this meeting is typical of other such gatherings, there are many important agenda items on your plate and little time to dedicate to each of them.
- First, I wish to thank the campus Presidents and industry heads for your involvement in AMP. Given the number of commitments demanding your attention, your direct participation in the program elevates even higher the significance and merits of this endeavor. I also extend appreciation, both personally and on behalf of the System, to Dr. David Ferguson, for his able leadership of the program, and to all of your colleagues and staff who are also involved. Indeed, the success and achievement of AMP's goals are directly attributable to your efforts and to your dedication to the principles espoused by the program.
- I would also like to commend the National Science Foundation for its sponsorship of this effort at the national level, and express the System Administration's appreciation of its selection of Stony Brook and the State University of New York as a site for the program, incontrovertible evidence of NSF's wisdom in this instance and in the 541 other instances of awards to SUNY campuses.

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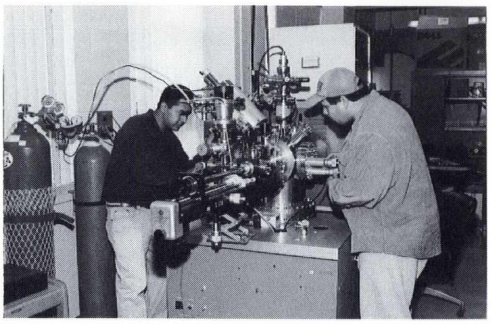
HIGHLIGHTING THE INTEGRATION OF RESEARCH AND EDUCATION AT STONY BROOK AMP by Michele McTernan, Coordinator



"Undergraduate and graduate education are part of the whole in a major research university. The symbiosis between the two should improve both graduate and undergraduate education."

--Shirley Strum Kenny, President, The University at Stony Brook

The SUNY Alliance for Minority Participation is well represented by the University at Stony Brook, a national leader in the integration of research and education. Stony Brook has a strong tradition of undergraduate research in science, math and engineering (SME). Approximately 40% of our undergraduates engage in research activities through research courses, research internships, employment, voluntary participation, or research grants or REU supplements to faculty grants. In addition, Stony Brook is one of ten research-intensive universities in the United States to be selected for a National Science Foundation Recognition Award for The Integration of Research and Education (RAIRE) in its SME graduate and undergraduate programs.

Our spotlight today falls on Stony Brook's Department of Materials Science and Engineering, in the College of Engineering and Applied Sciences (CEAS). This department has taken an active role in providing undergraduates with opportunities for direct involvement in scientific research.

Materials science is an interdisciplinary study, which combines metallurgy, physics, chemistry, and engineering. Subfields include ceramics, biomechanics, semiconductor processings, polymer science, corrosion studies, and environmental studies. Every industry, even one that deals purely with information, relies on the materials used. From I-beams to computer chips, our world is limited only by its materials, and this science is forging the paths of future technology.

Facilities within the department at Stony Brook include the Crystal Growth Laboratory; Surface Analysis and Corrosion Science Laboratory; Garcia Center for Polymers at Engineered Interfaces (funded by NSF); LEED/Surface-Structure; Magneto-Optics Group; Materials Characterization Lab; Thermal Spray Lab (TSL) with its Center for Thermal Spray Research (CTSR) (funded by NSF); Thin Film and Interface Lab; and the Synchrotron X-ray Topography Group.

For 25 years, the department has enjoyed a close relationship with Brookhaven National Laboratory and with industry within and beyond the Long Island region. The CEAS Engineering 2000 initiative has strengthened this connection, and the students are an integral part of this growth. The department's support of all undergraduate students has been outstanding. This is particularly impressive since there is no undergraduate materials science major. At about 26%, underrepresented students are present in the engineering science major at a higher rate than in many SME departments, and it is from engineering science that most of the undergraduate researchers in materials science are recruited.

Marvin Vasquez, '97, a SUNY AMP graduate, is one of the scholars who, as an undergraduate, was already a functional member of the Materials Science team. His undergraduate research involved assembling a secondary ion mass spectrometer, which is used to determine the composition of a sample for chemical analysis. Marvin also enjoyed presenting his research at conferences for AMP and for his department. He is now a graduate student in Materials Science, continuing his studies in the Surface Analysis and Corrosion Science Laboratory directed by his faculty advisor, Prof. Clive Clayton.

When asked which factors were most significant in his decision to continue his studies, Marvin thoughtfully replied, 'I decided to get a higher degree to test myself. And of course, as you study for a master's degree, you become an expert in a specific area. Employment opportunities are much better and the nature of the work is more satisfying.'

One current undergraduate researcher is Deidre Forde, '98, who is co-sponsored by AMP and RAIRE. Under the guidance of Prof. Franco Jona, Deidre is studying the growth of multilayer thin films. This work has applications, for example, in advanced hard-disk drive technology. Deidre also plans to continue her studies past the undergraduate level. Like Marvin and all the students supported by SUNY AMP, Deidre has become an indispensable member of the team, representing AMP and her department at scientific conferences and other official functions.

The Department of Materials Science is among the many outstanding academic departments within the Alliance that have taken an active role in the effort to increase the numbers of underrepresented students completing bachelor's degrees. The department's active encouragement of students wishing to continue their studies into the graduate level is exemplary.

A recent study done at the University of Washington determined that over the last 30 years, MS and PhD degrees awarded to African-American scholars averaged about 2 1/2% of the total. The figures were even lower for Latinos (<2%), and fell to 0.3% for Native Americans. The Department of Materials Science at the University of Stony Brook is aware that only through diversity will the field stay viable as the nation diversifies demographically. The SUNY Alliance applauds their vision and dedication.

Stony Brook is *"a new kind of university which infuses the value of scholarship into all aspects of its academic mission . . . placing students at the center of its professional endeavors, not just as recipients of our best teaching efforts but also as observers of and participants in our scholarship."*

--Rollin C. Richmond, Provost, The University at Stony Brook

THE SUNY AMP CHALLENGE

continued from page 2

- State support through interface with the New York State Collegiate Science and Technology Entry Program in every SUNY AMP region
- Placement at the forefront of curriculum and pedagogical change as seen by partnership with the NSF General Chemistry Teaching Workshop and the Long Island Consortium for Interconnected Learning (LICIL), PASS model courses on many campuses, and involvement of over 227 faculty in these and other related workshops
- Proof of extensive institutional support as seen in exceeding the first year cost-share goal by more than $80,000
- Establishment of an extensive network of student services as seen by participation of 101 students in summer programs, 18 students in industry internships, 66 students in research placements, and 409 students in tutoring and study groups

SUNY AMP has galvanized the talents and energies of people from many sectors of the state. We have come a long way since the inception of the project. We have a long way to go to meet our goals. We enlist your support and cooperation in this exciting and important endeavor.

REMARKS TO THE BOARD OF GOVERNORS

continued from page 2

- As a System, we are especially pleased with the AMP program because it dovetails with many other initiatives contributing to the improved quality of higher education at State University campuses. We applaud you because you are:

  Geared to the best and brightest — highlighting the achievements of our minority students and becoming a catalyst for greater minority student participation.

  Doing the work together—as an alliance — cooperatively and collegially, optimizing the resources available across our campuses.

  Judged by outcomes; outcome measures are determinative of continued funding by NSF.

  Incorporating 'best practices'— building on programs with a demonstrated record of success and effectiveness.

  Strengthening the cooperation and work already underway with our colleagues in the K-12 educational sectors.

  Fostering and strengthening articulation between and among two- and four-year institutions.

  Assisting in student retention and graduation by providing students with the help they need to complete their degree requirements successfully.

  Working closely with business, industry and government to provide meaningful internships to students, giving them both a theoretical and applied [practical] educational experience, and

  Espousing Access and Excellence — goals unequivocally supported by the State University of New York.

- For these reasons and for the many others that time constraints today do not permit me to address, on behalf of the System Administration, I commend you for your efforts and dedication and affirm my personal and the System Administration's continued support for this laudable initiative.

SUNY AMP AROUND NEW YORK STATE

HUDSON VALLEY REGION by Deb Gould, Coordinator

SUNY College at New Paltz
A Preparatory Science Course

Often students interested in studying science or engineering in college do not succeed in passing the introductory courses sometimes referred to as "gatekeeper" courses. The reasons for failure can include inadequate preparation for college level work particularly in science, poor problem solving/study skills, unrealistic expectations and failure to understand how to make a real commitment to college study. Courses aimed at the underprepared student generally focus either on increasing knowledge of science and perhaps problem solving or study skills and attitudinal issues. The Program for Access to Science Study (PASS) model developed at City College, with funding from the Fund for Improvement of Postsecondary Science (FIPSE), combines these two elements.

At New Paltz we have developed a two-credit course called Fundamentals of Science and Engineering based on the City College model. It consists of a preparatory science course with a special counseling seminar taught by another instructor incorporated directly into the curriculum. In the science portion of the course, students are introduced to critical background material in physics and chemistry and gain problem solving experience both in the classroom and laboratory settings. The counseling seminar, held one hour (out of four) each week, is devoted to promoting students' abilities to monitor, evaluate and adjust their behaviors in order to achieve their academic goals. Students' experiences in the science portion of the course are used to accomplish this. The seminar instructor attends the science classes in order to observe the students' behaviors and to stay in touch with course requirements. The progress of the students is constantly monitored by both instructors, and the content of either component of the course can be altered to address particular needs as they arise. We now offer this course to three groups of students and are tracking their academic performance, particularly in science/engineering courses.

We were pleased that a new course, Fundamentals of Biology, received the approval of the biology faculty and is being offered this semester for two credits. Run similarly to the Science and Engineering course, it introduces students to concepts in chemistry and biology while offering them the counseling seminar experience to enhance their learning and study skills.

New Paltz AMP Collaborates with Faculty Member on NSF Grant

A faculty member in the Mathematics Department at New Paltz approached AMP earlier this year with a plan to collaborate with us as he wrote a proposal for an NFS research grant. He asked that we hire two of our AMP students to work with him during the spring of 1998 to receive training and develop background knowledge for the project. He felt that a collaboration with us would appeal to the funding agency, assist him in preparing his research, and give students an opportunity to participate in a research project as undergraduates. If he received funding, he then would hire the two students to be his research assistants for the duration of the grant, beginning in the summer of 1998. The faculty member received the grant, and two of our AMP computer science students are currently working with him on developing the project. Their work will continue through the summer as research assistants.

New Paltz Update

-60 students in the AMP Program; 10 in pre-AMP
-approximately 30 students are currently receiving tutoring in 13 subjects, with workshops being offered in two additional courses.
-a peer mentoring program has begun with, so far, three mentors paired with 4 students, by major.
-8 AMP students will be attending the CSTEP Statewide Student Conference in April. They will be presenting their research completed in the 1997 Summer Research Program in the poster competition.
-5 faculty proposals have been approved for our 1998 Summer Research Program; applications are being distributed to students.

LONG ISLAND REGION by Henry Teoh, Regional Co-Director

FOUNDATIONS OF CALCULUS WORKSHOP FOR SUNY-AMP

One of the "gatekeeper courses" preventing many students from achieving their goals as a scientist, engineer or mathematician is calculus. Students frequently find themselves unable to keep pace because of a lack of familiarity with the necessary mathematical tools. Such students may experience considerable difficulty in acquiring the requisite mathematical background due to a whole host of reasons. The College at Old Westbury, a member of the SUNY AMP Program, is offering a special four-week summer program to provide AMP students with a strong foundation with the mathematical and problem-solving skills necessary for physical science, engineering and mathematics disciplines.

AMP students are required to stay in the college's residence halls during the week and participate in an intensive calculus workshop. The basics of calculus using technology (such as graphing calculators, a computer laboratory which provides alternate ways of solving problems), motivating concepts and exploring and investigating math ideas, taught along with experienced teachers with a small class size, are some of key features in this workshop. A nurturing environment provided by award-winning teachers, coupled with close interaction with faculty members, counselor/tutors, and other AMP students throughout New York State, is anticipated to yield fruitful results.

BUFFALO REGION by David Blackburn, Coordinator

SUNY AMP MINORITY RESEARCH INTERNSHIP SUMMER PROGRAM

WHAT IS THE SUNY AMP MINORITY RESEARCH INTERNSHIP SUMMER PROGRAM?

The State University of New York Alliance for Minority Participation (SUNY AMP) Minority Research Internship Summer Program is an eight-week summer project designed to encourage traditionally underrepresented minority undergraduates in natural sciences, mathematics, computer science and engineering to attend graduate school and to acquaint them with research and graduate study at the State University of New York at Buffalo (UB). While in attendance, students will gain research experience and participate in scholarly activities traditionally encountered in graduate school.

The program will begin May 27, 1998 and end July 17, 1998. During the program, each student will pursue a research project as an intern with a faculty mentor or a professional in the private industry. In addition, students will engage in a credit-bearing Research Methods course and weekly seminars addressing graduate study preparation and career planning. Field trips to local business and cultural facilities and other enrichment activities are also planned. Students will give a poster presentation of the research internships at the end of the program. The program will provide campus housing for students unable to commute. Upon completion of the program, participants will be equipped with knowledge and skills that will aid their preparation for and enrollment in graduate school.

WHO MAY PARTICIPATE?

- The program seeks to enroll twenty (20) talented undergraduates from the following traditionally underrepresented minority groups: African-Americans, Hispanic-Americans and Native-Americans.
- A minimum grade point average of 2.7 is required for students in Chemistry, Geological Sciences, Computer Science, Mathematics, Engineering & Applied Sciences, and Physics.
- Applicants must be majors or intended majors in the following academic disciplines, which represent the proposed internship sites for the program:

  -Chemistry
  -Computer Science
  -Engineering & Applied Sciences
  -Geological Sciences
  -Mathematics
  -Physics

- Candidates must attend or plan on attending a SUNY AMP college.
- U.S. citizenship or Permanent Resident status is required.

Please direct all questions to David Blackburn at (716) 645-2234 or 645-2002 or e-mail at :deb4@acsu.buffalo.edu

BINGHAMTON REGION by Patricia Louison, Coordinator

BINGHAMTON SUCCESS PROGRAM : Students Challenged to Achieve A 4.0

The Binghamton Success Program (BSP) supports and encourages its students as they pursue excellence and scholarship in their academic and professional endeavors.

On January 31, 1998, Donna O. Johnson came to talk to BSP students about her "Guaranteed 4.0 Learning System." With over 120 students in attendance, she provided a practical approach to learning principles and concepts for any motivated student interested in obtaining a 4.0.

Ms. Johnson, a chemical engineer by training, provided specific information and learning techniques, applicable to the future scientists, mathematicians and engineers involved in the program.

See our Web page at:
http://www.bsp.binghamton.edu

Upcoming Events:

April 1998-
- Dr. Carlton Truesdale, Inventor, "The Engineering of Ideas"
- Student-Faculty Mixer

May 1998-
- "Maximizing Your Research or Internship Experience"
- Corning, Incorporated Industry Tour

June 1998-
- Urban League, Upward Bound Information

SUNY AMP UPCOMING EVENTS

March 30	Research and Undergraduate Education Conference-University at Stony Brook, Stony Brook, New York
April 17-19	CSTEP/SUNY AMP Student Research Conference, Sagamore Conference Center, Lake George, New York
April 18	SUNY AMP Board of Governors' Meeting, Sagamore Conference Center, Lake George, New York
April 18	SUNY AMP Steering Committee Meeting, Sagamore Conference Center, Lake George, New York
May 26-June 19	Foundations of Calculus Workshop Summer Program, College at Old Westbury (open to all SUNY AMP students)
July 17-21	Sixth Annual NSF/AMP Research Conference in Pablo, Montana, "Continuing the Circle through Education and Research"
Fall 1998	Publication of the SUNY AMP/CSTEP issue of the *Journal of Undergraduate Research*

NEWS BRIEF

David Ferguson, SUNY AMP Project Director, was one of ten individuals nationally to receive the 1997 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. The award, jointly administered by the White House and The National Science Foundation, recognizes individuals for their personal efforts and programmatic innovations in increasing the participation of groups underrepresented in science, mathematics and engineering. Professor Ferguson was recently appointed Director of the Center for Excellence in Learning and Teaching at the University at Stony Brook. This new position will provide opportunities for a strong collaboration with SUNY AMP to develop new instructional technologies and teaching methods.

FOR INFORMATION ABOUT SUNY AMP, you can contact:

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Long Island Region	516-632-7093	Michele McTernan, Coordinator (mmcternan@notes.cc.sunysb.edu)

You can also visit our Web Page at: http://www.ceas.sunysb.edu.edu/DTS/AMP

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