

Achieving and Demonstrating

PROGRAM EFFECTIVENESS

Value added to Institutional Program

Coherence of Program

Number of Graduates

Student Performance

Student Support Programs

Academic Performance Indicators

Articulation Agreement

Evidence of Institutionalization

Teacher Preparation

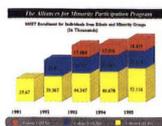
Cost Sharing

**THE NATIONAL SCIENCE FOUNDATION
ALLIANCES FOR MINORITY PARTICIPATION**

1997

*(1991) Alabama; California; Mississippi; Puerto Rico; Western Alliance; Texas;
(1992) Florida-Georgia; New York; North Carolina; South Carolina; Texas System;
(1993) California State; Chicago; New Mexico; Washington, DC; (1994) Detroit; All Nations;
Oklahoma; Philadelphia; (1995) Louisiana; Maryland; Missouri; Tennessee/Arkansas;
Xavier/UNCF; (1996) Colorado; State University of New York*

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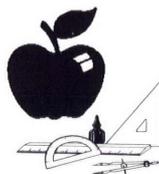


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FIFTEEN AMP PROJECTS UNDERGO PROGRAM EFFECTIVENESS REVIEW

Fifteen of the twenty-six AMP projects underwent a rigorous Program Effectiveness Review at the National Science Foundation last fall. Because of congressional passage of the Government Performance and Results Act (GPRA) of 1993, commencing in FY 1999, NSF budget requests must be *outcome-based*. The goal of the Program Effectiveness Review (PER) is to gain a fuller understanding of the documented, effectively measured, significant, and reliable indicators by which progress is assessed according to program objectives, design and implementation strategies, and financial resources expended. PER represents a long-term effort to evaluate the AMP program at the national level. The fifteen projects representing the first three cohorts, Alabama, California, Mississippi, Puerto Rico, Southern Rocky Mountain, Texas, Florida-Georgia, New York, North Carolina, South Carolina, University of Texas System, California State University, Chicago, New Mexico, and Washington-Baltimore-Hampton Roads, each made a presentation to a review panel and responded to questions regarding progress and programs. The following indicators of progress were used to gauge the performance of each project:

1. value-added for inter-institutional programming;
2. coherence of program;
3. number of graduates by field, including delta from baseline;
4. student performance;
5. high school and community college articulation agreements;
6. student support programs;
7. academic performance indicators;
8. evidence of institutionalization;
9. teacher preparation; and
10. AMP institutional share of the minority SMET pipeline.

Enrollment and SMET Baccalaureate Degree Production are found in Figures 1 and 2 respectively.

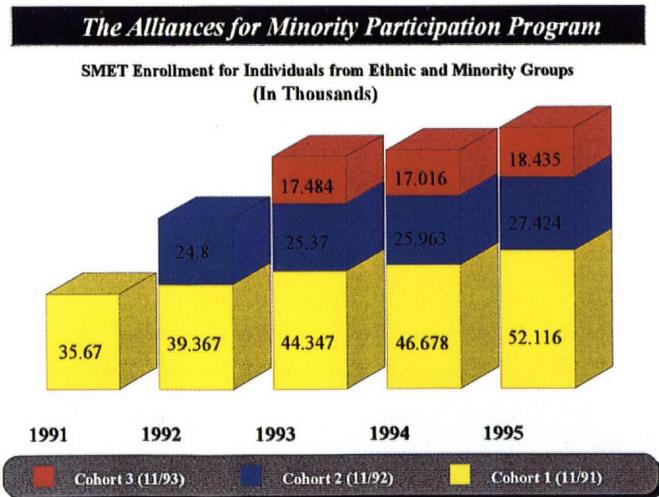


Figure 1

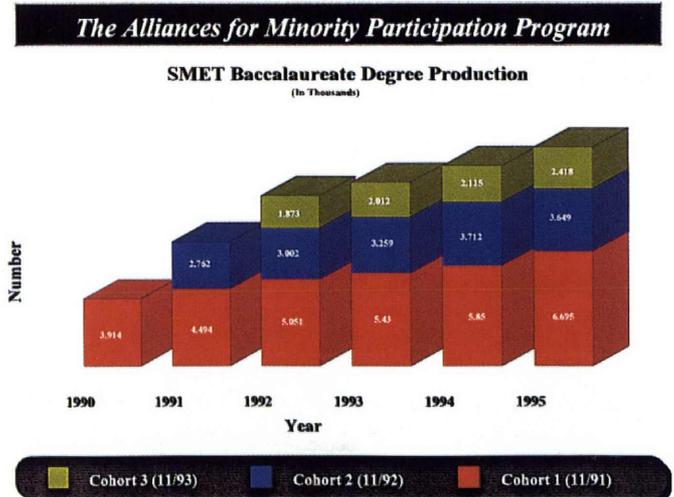


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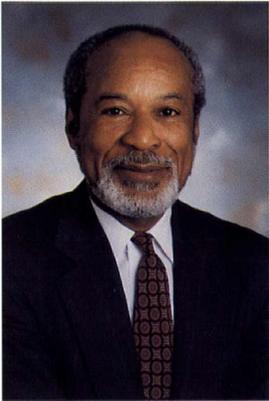
PER will become an annual exercise for all AMP projects.

SIX AMP PROJECTS BEGIN PHASE II

The six original AMP projects

Alabama, California, Mississippi, Puerto Rico, Southern Rocky Mountain, and Texas

began AMP Phase II this year. The National Science Foundation began the AMP program in 1991 to substantially increase the number of minorities receiving undergraduate degrees in science, engineering, and mathematics. The six Alliances pioneered the program for the first five years, accomplished agreed upon numerical goals, and implemented the AMP vision articulated by NSF.



“This is the first evidence that such a diverse collection of institutions can, under the design of a challenging program, achieve these types of results. . . . And it affords a very strong signal to the rest of higher education that is possible.”

Dr. Luther S. Williams
Assistant Director
Education and Human Resources



“AMPs play a big role in bringing together the faculty of community colleges and four-year colleges. A lot of students are starting their education in community colleges now,” and they need to be able to bridge the gap without being at a disadvantage.

Dr. William E. McHenry
Program Director
Alliances for Minority Participation

Prior to an award, NSF and the Project Director agreed on a numerical goal for undergraduate degrees. Figure 1 below.

Minority Bachelor's Degrees Awarded

<u>Alliance</u>	<u>1991</u>	<u>1996</u>
Alabama	437	882
California	615	896 ('95)
Mississippi	288	571
(SRM) Arizona	484	985
Puerto Rico	1709	2674

Figure 1

The number of AMP awards have increased from six in 1991 to twenty-six in 1996. There are now twenty Phase I AMPs and six Phase II AMPs. Each year a cohort of Phase I AMPs will undergo a rigorous evaluation to determine if they will enter Phase II.

19 AMP PROJECTS HIGHLIGHT PROGRAM EFFECTIVENESS

Alabama AMP



- Research institutions in the Alliance—Auburn University, The University of Alabama, The University of Alabama at Birmingham, and The University of Alabama in Huntsville—are sharing their research facilities and faculty with other members of the Alliance through the Summer Research Internship Program. This is allowing those institutions to identify potential graduate students and to assist them with preparation for graduate school.
- The majority of funds provided by NSF, 65.9%, are used for direct student support. Prior to AMP, institutions put very little money into direct student support. This has changed in the last few years because AMP has been a catalyst for institutions to solicit funds for student support. This is a clear indication that resources provided by NSF are used strategically.
- The number of minority SEM students emerging from the AAMP pipeline since the award has increased by 100%. The three largest degree producing fields over the five-year period of the award have been engineering (1,064 degrees), life sciences (913 degrees), and computer science (466 degrees).
- The results of a retention study conducted for AAMP by the University of Oklahoma indicates that the lower end of the retention rates of AAMP institutions have steadily risen from 25.2% before AMP, to 61.9% as of 1992. This is a direct result of the implementation of AMP activities. AAMP students are performing quite well in their undergraduate research in the Summer Research Internship programs. Several students have published

their research findings with research mentors.

- The Alliance has been successful in institutionalizing two of the programs initiated with NSF support. During the first year of the award, each institution was given an average of \$25,000 to start an AMP Drop-In Center. Beginning with the 1996-97 academic year, each campus supports its Drop-In Center with its own funds. Initially, funds were provided to each institution to support mentors for AMP students. Mentors are now provided for each AMP scholar and each AMP intern at the expense of the institution.

California AMP



CAMP continues to grow at each of the University of California's eight campuses, increasing faculty involvement. Indicators of program effectiveness include student academic attainment, curriculum innovation, systematic retention activities, and an increase in motivation to prepare for graduate school. Coherence is fostered by cross-institutional coordination. Statewide, 1,500 students participate in various activities. Nearly 400 faculty, staff, and graduate students drive the program with student development ever in mind. Collective efforts to improve effectiveness are based on three guiding principles: 1) integration of research and education; 2) retention in SMET majors and degree completion; and 3) preparation for graduate school. The integration of research and education is perhaps the most visible evidence of programmatic coherence. Team projects in the laboratory under the direction of a faculty mentor provide essential development and exposure to science careers. Discipline- and course-specific workshops show that focused group problem-solving pro-

motes the analytical skills necessary to achieve success. The opportunity to contribute to a paper is another “constant.” More than 25 undergraduates have co-authored published research papers. CAMP students have been published in refereed journals including *Experimental Cell Research* and the *Canadian Journal of Chemistry*. Presentations at national conferences provide students with an opportunity to demonstrate their competitive edge by consistently taking top honors.

California State AMP



The measure of effectiveness of the CSU-AMP occurs at the intersection of activities with the bulk of the targeted minority students. As this program is in its third full year of operation, that intersection has been mainly at the freshman and sophomore levels, at which our summer and academic year workshops have been aimed. This year, the intersection is being extended to the junior and senior years with increased emphasis on undergraduate research and internship opportunities. Ultimately, we will emphasize the world of work and/or graduate study.

Our effectiveness at the entry level is illustrated by the numbers of summer workshop participants we had in each of the last three summers—numbers which exceeded our original proposal targets by up to 30%. Since the Fall of 1993, the total number of minority students enrolled in SEM has grown from 10,238 to 12,390.

While we have not focused on upper division students until this academic year, our enrolled seniors have grown from 3,862 in the Fall of 1993 to 4,774 in 1996. Our baccalaureate degrees, grew from 901 students at the end of the summer of 1993 to 1,105 students at the end of the summer of 1996. We have achieved almost 74% of our tar-

get of 1,500 graduates in the first three years of our AMP.

For the first time in years, the CSU's enrollment in SEM has started to increase. The increase this year to 54,551 students consists of an increase of 1,705 students.

We are certain that our activities led directly to the increases in new enrollees at both the freshman and transfer student levels. Most important of all, the retention of minority freshmen in SEM at the 81% level vs 72% for other students, is a direct result of our summer and academic workshop effectiveness.

✧ Colorado AMP ✧



Since its inception on November 1, 1996, The Colorado Alliance for Minority Participation has moved quickly to achieve program effectiveness within its 11 participating institutions. Various programs that have been initiated during the Spring 1996 semester include peer and faculty mentoring; tutorials; recitation sections associated with gatekeeper courses in chemistry, physics, and mathematics; undergraduate research activities; planning for summer internships; and scholarship awards for CO-AMP students. Summer Bridge programs for entering freshmen, and at least one for sophomores, are currently being developed with recruitment initiatives underway.

CO-AMP has entered into several collaborative efforts with other existing programs and has effected institutionalization activities. CO-AMP is also actively interacting with industry and governmental agencies, and communicating and working with the state legislature in order to create strong bridges state-wide and within the Four Corners region.



✧ Florida-Georgia AMP ✧

Program effective-

ness within the Florida-Georgia AMP transcends the entire curriculum. The prematriculation institute provides students with a foundation to persist through the freshman year and fosters peer support which is observed among every cohort. Participation of undergraduates in the FGAMP program has grown from 454 in 1993 to more than 700 in 1996. A key factor in this increase has been the special appropriation received from the Florida Legislature for support of the Florida institutions. Over the past four (4) years, the Alliance graduated 214 scholars who received funding through the project. More than 80% of these students participated in one or more of the 325 summer internships secured through the Alliance. The homepage for the Alliance was developed by one of the FGAMP student organizations and is linked to all institutions in the project. The combination of mentoring and academic advisement have benefited the Alliance to the extent that more than 80% of the FGAMP scholars are progressing timely toward the B.S. degree in the SMET areas.

✧ Heartland's AMP ✧

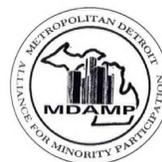


The effectiveness of a program is measured by the extent to which it achieves predetermined goals. The Heartland's Alliance for Minority Participation endeavors to increase the number of underrepresented minority undergraduate degrees in science, engineering, and mathematics (SEM) by 15% per year and the number of graduate degrees by 50% during the life of the award. During HAMP's first year, the number of undergraduate degrees increased by 48%, and the number of graduate degrees increased by 76%. Undergraduate enrollment for underrepresented minorities in SEM disciplines increased by 22%, thereby enhancing opportunities for expanded degree production.

The Alliance is proud of its first

report card. Long-term, programmatic goals for the Heartland's Alliance will take longer to achieve. These goals include: institutionalizing HAMP activities; developing resources from business and industry; developing collaborative working agreements with other projects funded by the National Science Foundation; and funding internships through the Missouri General Assembly and state agencies.

✧ Metropolitan Detroit AMP ✧



Program effectiveness in the MDAMP can be viewed in several ways. First, members of the Alliance continue with monthly/six-week meetings which rotate host duties among the partners. This practice has allowed us to meet key individuals at various campuses to discuss **Best Practices** techniques at that particular campus. From the sharing of ideas and practices we have been able to export/import programs from one campus to the next. Our meetings have also led to such projects as the visit of Uri Triesman to one of our campuses.

Another sign of program effectiveness is in the ever increasing number of undergraduate researchers at our institutions. These increases can be linked to student word-of-mouth and faculty identification of students with the desire to work in a lab and learn from the experience. These research students have become great ambassadors to the labs and to the departments they are in. These students have made faculty more accepting of having undergraduates in their labs. Faculty with positive experiences with undergraduates have been open to having other students in their labs and in some cases have several undergraduates participating in their research. Students also gained greater experience by presenting their work at the various conferences attended during the year.

These two examples of program effectiveness demonstrate the impact

of AMP on the institutions involved. What is clear is that the impact displayed currently will only mushroom to greater returns in the future.

✧ Mid-South AMP ✧



The success and effectiveness of the MAMP program is measured by how well we accomplish our program goals. The primary goal of the MAMP is to increase the number of minority graduates in science, mathematics, engineering, and technology. Several program objectives have been established to assist us in accomplishing this goal. They include:

1. INCREASING MINORITY ENROLLMENT

To increase the number of minorities in SMET majors at Alliance institutions, we have participated in several high school recruitment fairs and have utilized the assistance of regional and local high school science and math teachers, guidance counselors, principals, and community organizations to help identify highly motivated students interested in SMET careers.

2. ESTABLISHING MINORITY BRIDGING MECHANISMS

To establish bridging mechanisms from two-year to four-year colleges and then to graduate schools and/or professional careers, the MAMP students participate in undergraduate and graduate school fairs.

3. ENHANCING MINORITY RETENTION

Once students have been recruited, they participate in programs designed to ensure that they successfully complete their college degrees in SMET disciplines. The MAMP provides students with academic mentors, peer counselors, financial assistance through stipends, undergraduate research opportunities, professional mentors, and business and industry internship opportunities.

✧ Mississippi AMP ✧



The MAMP has been effective in achieving institutionalization through its model of cooperation among the participating institutions, an achievement that is a first in Mississippi history. The cooperative nature of our Alliance is probably its most unique characteristic. Exchange of program ideas and materials is MAMP's normal operating procedure. Successful programs developed at one institution are shared via MAMP Team meetings, workshops, site visits, and the annual MAMP Team Retreat. Through this cooperation all participating MAMP universities contribute to the success not only of their own students, but students at each of their sister institutions. This cooperation leads to a synergy that translates into systemic changes that otherwise would only be realized locally.

✧ All Nations AMP ✧



- South Dakota School of Mines & Technology and Oglala Lakota College have signed a transfer agreement. OLC students completing the Associate of Arts, Science/Engineering/Math degree can transfer as a junior in any program at SDSM&T.
- The All Nations AMP program at the University of Washington has funded part of the Native American Alliance for Learning & Vision for underrepresented Americans (ALVA) Bridge Program. ALVA initially was funded as a pilot program in partnership with White Swan High School on the Yakama Nation Indian Reservation.
- A new course will be offered at several university partners in the All Nations AMP. The course to be offered will be "Graduate School Preparation for Minorities."
- As a result of a collaboration between the ANAMP and the High

Plains Rural Systemic Initiative (HPRSI), several new opportunities will be offered both to teachers currently teaching on Indian reservations and native students involved in Teacher Preparation programs. The HPRSI at SKC will offer three summer institutes for credit.

✧ New Mexico AMP ✧



Program effectiveness is demonstrated by the following: 1) Two of New Mexico's AMP partners, New Mexico State University and the University of New Mexico, rank in the nation's top 25% for B.S. degrees granted to Hispanics in engineering, engineering technology, computer science, and mathematics; and for M.S. degrees in engineering technology, computer science, and mathematics. For Native Americans, the same two institutions also rank in the top 25% for B.S. degrees and the top 1% for M.S. degrees granted in engineering technology, computer science, and mathematics. 2) A Teacher Preparation component will be conducted through the New Mexico AMP partners. The program will be coordinated with three other NSF-sponsored programs in New Mexico—the New Mexico Statewide Systemic Initiative; the Utah, Colorado, Arizona, and New Mexico Rural Systemic Initiative, and the Regional Alliance for Science, Engineering, and Mathematics. 3) New Mexico AMP also took the lead in submitting the Collaborative for Excellence in Teacher Preparation (CETP) proposal to NSF. Now approved for NSF funding, New Mexico CETP represents a partnership of five universities, four community colleges, eleven public school districts, two state agencies, and two national laboratories. 4) New Mexico AMP continues to lead the state in developing articulation agreements that facilitate the transfer of minority students from the state's two-year colleges to one of six, four-year universities. A New Mexico AMP

Articulation Guide describing the articulation process and providing a replicable model to pursue and develop articulation agreements is nearing completion.

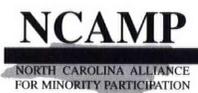
New York City AMP



- The cumulative totals for NYC AMP research scholars from 1993-1996 inclusive, are as follows: 15 CUNY campuses; 259 research scholars; 131 faculty mentors; 95 of the 259 research scholars have earned baccalaureate degrees; and 114 of the 259 research scholars remain in a baccalaureate degree program.
- Thirty-seven (37) NYC AMP restructured calculus, physics, and chemistry courses have been institutionalized. Seventy-seven (77) sections of these courses (1,876 students) were completed during the Fall 1996 semester. Also, forty (40) sections (1,173 students) of non-institutionalized NYC AMP courses were offered during the Fall 1996 semesters.
- Five (5) of the NYC AMP funded community/senior college articulated research projects received supplemental funding from other sources.
- NYC AMP activities have led to the proposal and eventual funding of the NSF Chemistry Workshop project; as well as NASA's Institute on Climate and Planets Global Climate Variability; Science Teachers for the Next Millennium; and Minority University Space Interdisciplinary Network projects.
- NASA has awarded Phase II (1997-2000) funding for the Institute on Climate and Planets project which will continue to be administered by the NYC AMP office.
- Fourteen (14) of the sixteen (16) NYC AMP Learning Centers have been institutionalized by individual CUNY campuses.

- Ten (10) of the sixteen (16) CUNY AMP campuses have completed SEM course articulation agreements.

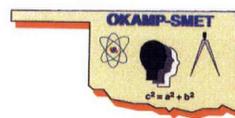
North Carolina AMP



The chief aim of the North Carolina Alliance for Minority Participation (NCAMP) continues to be to significantly increase the numbers of underrepresented minority students earning B.S. degrees and subsequently pursuing Ph.D. degrees in SMET disciplines by systematically enhancing recruitment, retention, access, and opportunities to education, internships, and research in these fields. Salient, newly developed program components linked to "value added" across the Alliance are directly related to curriculum reform of "gatekeeper" courses in science, engineering, mathematics, and technology and the delivery of quality instruction. Specifically, students at each partner campus have been actively engaged in collaborative learning approaches, and expanded hands-on experience in SMET through undergraduate research opportunities, internships with industry, interaction with class projects, and participation in SMET professional meetings and conferences.

In addition, the NCAMP supplemental Collegiate Curriculum Reform and Community Action (CCRCA) Program focusing on the application of graphing calculators to teach calculus has positively impacted faculty and students at 16 minority-serving institutions under the auspices of North Carolina A&T State University. Also, the NCAMP Teacher Preparation Initiative is boosting the number of minority students certified to teach K-12 mathematics, science, and technology.

Oklahoma State AMP



The primary goal and objective of OKAMP-SMET is to in-

crease the number of underrepresented minorities in SMET fields by 15% annually. An overview of the numbers show this program to be highly successful. Compared with baseline information in 1994, Year One (1995) saw a 14.9% increase in minorities graduating in SMET fields. Year Two (1996), however, saw only a 4.8% increase over 1995. This may seem low, but compared with a 6.6% decline in non-minority graduates in Oklahoma, this number is excellent.

On another level, academic performance is increasing for OKAMP-SMET students and they are performing better than non-OKAMP students—3.06% (OKAMP) vs 2.69% (non-OKAMP) in 1996. Since the spring of 1995, the level of participation in OKAMP has increased by 32%. The presence of OKAMP is effecting positive changes in the academic culture of minority SMET undergraduates. At individual institutions, OKAMP students are distinguishing themselves by their dedication to the ideal of high scholastic achievement, by their recognition of the importance to undergraduates of having faculty mentors and peer support networks, and by their eagerness to do hands-on projects beyond the classroom. Projections for Year Three show an even greater potential for students graduating in SMET fields.

Greater Philadelphia Region AMP



The Lincoln Advanced Science and Engineering Reinforcement (LASER) program at Lincoln University encourages students to pursue engineering and science studies. The LASER program provides valuable preparation experiences for students entering careers in

engineering, chemistry, computer science, mathematics, and physics through its 10-week summer pre-freshman bridge and academic year components.

The LASER program has made a tremendous impact on the quality and quantity of SEM majors at Lincoln University. The LASER program furnishes approximately 70% of Lincoln's chemistry and physics majors. Approximately 70% of the LASER students maintain "B" or better averages, and 23% of the Dean's List consists of LASER students. Approximately 90% of the students in the bridge program enter an SEM undergraduate major, and about 70% complete an SEM undergraduate degree. Over 80% of the LASER graduates pursue graduate study.

✧ Puerto Rico AMP ✧



To achieve effectiveness and efficiency in SMET undergraduate programs at Alliance institutions, the PR-AMP utilized a virtual structure to reform the undergraduate educational system and to serve as a catalyst and an agent of change. This virtual structure is the Resource Center for Science and Engineering (RCSE), which keeps constant linkages with the national reform movement in education and cognitive science, and with the industrial and business communities. The information obtained from these links is transferred to the participating institutions and is converted by the PR-AMP project into educational strategies, specific objectives, and benchmarks to implement and measure progress of reform. At the same time, the RCSE, through PR-AMP, follows a two-prong approach with participating institutions: it interacts directly with CEO's of the participating universities to promote the development of policies and systemwide strategies for reform, while,

simultaneously, providing professional development and facilitating the formation of leadership and a cadre of reform professors who are empowered to pioneer educational reform. This two-prong approach has resulted in more effective SMET programs since a simultaneous bottom-up and top-down approach to reform has been institutionalized.

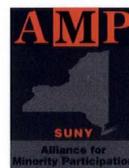
✧ South Carolina AMP ✧



The South Carolina AMP has proven effective in curriculum reform, student research, mentoring/tutoring, and in summer bridge programs. Students who participated in the 1995-96 summer bridge program at Voohees College did so well in the chemistry component that Voohees offered chemistry as a major for the first time during the 1996-97 school year. Many of our SCAMP students conduct research at their home institutions during the school year. Each summer the University of South Carolina offers positions through the SC EPSCoR program to place our students in summer research positions. Many students go forward to graduate school after participating in the summer research program. The younger students who participate often compete for research internships in industry after their rewarding summer experience at the University of South Carolina. Mentoring and tutoring programs play key roles at our institutions. Clemson University leads in this area of success as shown by students' grades and overall academic performance. Benedict College has also institutionalized their summer bridge program which offers a mentoring component to prepare the students for college life. As evidenced by yearly retention data, students who participate in the summer bridge programs earn higher grades in their coursework as compared to students who do not participate in the bridges, and they also

complete major coursework rather than transferring.

✧ Stony Brook AMP ✧



In its first year of operation, SUNY AMP has already begun to support infrastructure that will encourage greater participation by underrepresented minority students in SMET. SUNY AMP, in partnership with the NSF-supported Long Island Consortium for Interconnected Learning (LICIL) in quantitative disciplines, is helping to impact on how dozens of faculty members teach and how thousands of students learn. SUNY AMP and the New York State-supported Collegiate Science and Technology Entry Program supported a student research conference attended by 350 minority students pursuing majors in SMET. In addition, academic support for cooperative problem-solving groups and discipline-specific learning centers has been strengthened. Furthermore, more students are taking advantage of the strong articulation agreements between community colleges, four-year colleges, and the university centers. In recognition of the accomplishments and promise of Stony Brook AMP, a part of SUNY AMP, Computer Associates has awarded Stony Brook an \$800,000 grant to be used to increase the number of minority students who receive bachelor's degrees in computer science at Stony Brook.

✧ University of Texas System ✧



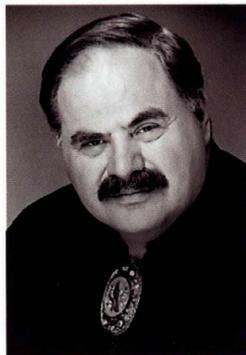
The UT System Alliance represents a commitment, at the highest level of leadership, to enhance the participation of all students in SMET majors. This commitment is demonstrated by systemic changes introduced through curriculum reform efforts, the success of the summer bridge programs, and the cooperation between

Continued on page 26

Grand A M Ps Helped to



Dr. Louis Dale
*The University of Alabama
at Birmingham*



Dr. Gary Keller Cardenas
Southern Rocky Mountain

Six years ago, six universities received the first awards under a new National Science Foundation (NSF) program called the Alliances for Minority Participation (AMP). The universities, Arizona State University; Jackson State University; Texas A&M University; The University of Alabama at Birmingham; the University of California at Irvine; and the University of Puerto Rico, were the first of a long line of universities to receive funding for proposals designed to address the problem of underrepresentation of minorities in the fields of science, engineering, and mathematics. During the first year of the AMP program, Dr. Luther Williams, Assistant Director for Education and Human Resources; Dr. Roosevelt Calbert, Director of the Division of Human Resource Development; and Dr. William McHenry, newly

Q. As one of the first AMP project directors, you are considered a pioneer in the development of strategies to increase minority participation in SEM fields. What do you consider to be the greatest accomplishment of the national AMP program in its first five years of existence?

Sullivan: The greatest accomplishment of the national AMP program in its first five years has been to cause educational systems to take an unprecedented responsibility for improving the effectiveness of undergraduate programs in SMET, as manifested in significant increases in the number of minority students earning baccalaureate degrees in these fields.

Keller: The National AMP program has produced a significant increase in the quantity and quality of underrepresented minority SMET baccalaureates. It has also brought together community colleges and four-year institutions from across the country, creating a network of educators who share ideas and methods for enhancing students' opportunities in SMET.

Gomez: For the first time we have a concerted effort, nationwide, to increase the number of minority students who receive SMET degrees; emphasis is now being placed on the improvement of SMET student performance within a rigorous academic program; institutional culture is being changed to provide for a more nurturing environment for minority SMET students; and a systemic strategy to increase the participation of minorities in SMET careers.

Dale: The greatest accomplishment of the national

AMP program in its first five years has been to involve scientists, educators, administrators, businesses, and state and local agencies in proposing and implementing long-term successful solutions to the national problem of underrepresentation of minorities in SMET fields.

Q. What do you consider to be the greatest accomplishment of your particular AMP project?

Sullivan: The greatest accomplishment of the Mississippi AMP program in its first five years has been to develop an effective partnership among the public universities, the first of its kind in the history of the state, to improve the ability of the statewide system to educate African-American students in SMET disciplines where they continue to be severely underrepresented.

Keller: Five years ago, our Alliance committed to one of the most challenging goals in higher education—doubling the number of African-American, American Indian, and Hispanic bachelor degrees in science, mathematics, engineering, and technology among 35 participating colleges and universities in Arizona, Colorado, New Mexico, Utah, and Western Texas. We are happy to report the successful achievement of this ambitious goal. In the five operating years of the Alliance (academic years 1991-1996), the number of targeted bachelor degrees awarded annually has more than doubled from 484 to 985, exceeding the original target of 976 degrees.

Gomez: The transformation of the teaching/learning

Pioneer A M P Program

appointed AMP Program Director, held several meetings with the six new project directors to chart a course for the AMP program and to implement NSF's vision for AMP. The project directors, Dr. Louis Dale (Alabama AMP), Dr. Erdleman (Texas AMP), Dr. Gary Keller Cardenas (Southern Rocky Mountain AMP), Dr. Elroy Rodriguez (California AMP), Dr. Richard Sullivan (Mississippi AMP), and Dr. Manuel Gomez (Puerto Rico AMP), became fast friends and participated in many collaborative efforts to achieve AMP program goals. Four of the six original project directors (Dale, Keller, Gomez, and Sullivan) are still leading their projects. They were interviewed by M. Carolyn Braswell regarding their experiences with AMP.



Dr. Elroy Rodriguez
University of California,
Irvine



Dr. Richard Sullivan
Jacksonville State
University

culture at participating institutions, resulting in undergraduate SMET programs that are more effective and efficient.

Dale: Of the many accomplishments of the AAMP program, the greatest has been the establishment of a lasting collaboration between all of the Historically Black Colleges and Universities in the state and all of the major state universities to successfully double the number of minorities receiving undergraduate degrees in SEM fields over the last five years.

Q. The AMP program is the first NSF program to consider significant progress toward stated goals as a requirement for continuation of funding. Did this requirement play a significant role in the success of your project?

Keller: Yes, because of the persistent focus on tangible, quantitative outcomes, our Alliance institutions were able to come together productively for a common purpose and objectively evaluate how each institution might best function with respect to increasing student opportunities. By carefully retaining focus on the stated goals, we were provided opportunities to make mid-course corrections by modifying, adding, or subtracting activities undertaken during the past five years.

Gomez: Programs tend to be more effective and efficient when you have to provide measures of accountability to evidence progress. In this respect, NSF's emphasis on achieving previously agreed upon measurable goals (i.e., number of B.S. degrees awarded in SMET), has made AMP institutions accept the responsibility for the retention and graduation of

their SMET minority students. It has put an end to the "revolving door syndrome."

Dale: Definitely! This requirement motivated each Alliance member to seriously keep the AAMP program goals in full focus and, in particular, keep individual institution goals at the forefront of all project activities. In addition, funds were provided to Alliance members according to the progress made annually toward their particular goals.

Sullivan: The requirement by NSF to reach annual milestones or show significant annual progress did not play a key role in the success of the MAMP. On the contrary, the success of our program, due to the nature of its design, made it easy to meet the NSF requirement to show annual progress.

Q. The common threads of Phase I AMP projects are Summer Bridge programs, research experiences for undergraduate students, and academic enrichment programs. What do you predict to be common threads of Phase II AMP projects?

Gomez: Institutionalization and dissemination of successful AMP activities; revision of the SMET curriculum; and evaluation/assessment

Dale: The common threads of Phase II AMP will be a) providing research experiences for undergraduates at national laboratories, b) providing Graduate Bridge programs, and c) implementation of Teacher Preparation programs.

Sullivan: In addition to the common threads from Phase I AMP programs, which will continue, Phase II AMP

programs will implement strong liaison with graduate programs, through Graduate Bridge programs. The graduate schools at AMP universities and others with strong SMET programs will be the natural first choice of AMP graduates to enter doctoral programs.

Keller: AMP is made to order for export to other institutions and national replication. Phase II AMPs will introduce extensive use of advanced computer technology in order to be cost effective: (1) enhance student and faculty skills; (2) create a significant number of student and faculty participants in these enrichment programs; (3) target for changing key transitions in the academic life of students, thereby increasing retention; and (4) construct a new environment that provides student-faculty interactions outside the classroom.

Q. The National AMP, as with other government programs, has a two-part implementation-institutionalization strategy. As your project moves from Phase I to Phase II, please comment on the success of your program's Phase I institutionalization.

Dale: The Alabama Alliance has successfully institutionalized two of its AMP implemented programs, namely the Drop-In Centers and the Mentoring program. During the first year of the project, each Alliance member was given start-up funds for a science and engineering Drop-In Center, a place where science and engineering students meet to help each other and to get help when needed. After four years of decreasing funds, the centers are all supported by their institutions. Similarly, institutions were provided funds for mentors and now have assumed this responsibility.

Sullivan: Many of the activities begun by the MAMP, such as Summer Bridge and IMAGE Centers, have been institutionalized, to some degree, by our institutions. Also, some of the focused intervention strategies have been adopted at the school and departmental levels. An example of an institutionalized intervention strategy is the close monitoring of class attendance, which is mandated by academic policy, followed up by requiring a change in the behavior of students, which is monitored, also.

Keller: We have over 500 resource individuals at 75 campuses and organizations participating in our AMP. Approximately 85% are scientists, engineers, and other faculty, and 15% are administrators. Just over 40% of these resource participants are underrepresented minorities themselves. Our AMP counts on the participation of over 200 research faculty from its comprehensive universities.

Over the past 5 years, we have served 2,852 students in our activities. This large number of students is well beyond the critical mass needed to create institutional changes in student behavior.

Using Treisman's model, we have created sustainable peer study groups in the gatekeeping courses in mathematics, engineering, and science, thus reducing student isolation;

having students work at a high academic level; and increasing retention and graduation rates.

Gomez: During Phase I, the PR-AMP followed a two-prong approach with participating institutions: the Resource Center for Science and Engineering, the virtual structure to reform undergraduate SMET education, interacted directly with the presidents and chancellors of the PR-AMP institutions to promote the development of policies and systemwide strategies for reform while, simultaneously, providing professional development and facilitating the formation of leadership and a cadre of reform professors who are empowered to pioneer educational reform.

This two-prong approach has resulted in an effective institutionalization strategy that essentially consists of a simultaneous bottom-up and top-down approach to reform.

Q. In view of the current discussions of affirmative action and court decisions, what is your view of the status of the National AMP program five years from now?

Sullivan: Inherent in the goal of our AMP program is the aim to render the state university system better able to perform its mission of educating students (systemic change). Therefore, decisions about affirmative action will be inconsequential to our AMP. We will abide by the law and continue to pursue our goal of attaining inclusiveness by increasing the numbers of minorities who earn baccalaureate degrees in and enter graduate programs in SMET disciplines.

Keller: AMP has already led to an extraordinary and unprecedented level of cooperation among and within the participating institutions. This cooperative structure will become a permanent one. We anticipate that long after the NSF funding cycle, our Alliance will continue to exist and work to meet the challenge of educating and graduating more minority bachelors and doctorates.

Gomez: AMP has demonstrated to be extremely successful in achieving its congressional mandate of increasing the number of minority students who obtain B.S. degrees in a SMET field. I cannot visualize such a program being ended or limited by changes in affirmative action rulings, since the PR-AMP, in particular, has demonstrated that the strategies implemented have been successful in improving academic performance of all SMET student participants by improving the effectiveness and efficiency of the SMET programs. Because of this, I visualize AMP, at the national level, being strengthened and asked to expand its scope to include **all** students, not just underrepresented minority students.

Dale: Affirmative action will be around for a while. The AMP program has been a catalyst for change in the academic culture with regard to opportunities for minorities. Institutions will not retreat from their responsibility to provide access and opportunity for underrepresented minorities. The AMP programs' implementation-institutionalization strategy will definitely complement affirmative action efforts.

Q. It is widely accepted that the AMP program is successful and effective. What features of the program do you consider to be responsible for its success and effectiveness?

Keller: A focus on the student, along with a persistent emphasis on quantitative goals, has made the AMP program accountable and effective. Data collection is an important feature of this effort. Equally important is the attention to student feedback and comments which provide reality checks and help the Alliances meet student needs in a timely manner.

Gomez: Emphasis on accountability (value-added of the reform); emphasis on collaboration rather than isolated programs; emphasis on rigorous SMET programs; emphasis on institutionalization; and articulation with other systemic SMET reform efforts

Dale: The requirement that the majority of funds support students and student activities. These activities include Bridge programs, research experiences, student and faculty mentors, and academic enrichment. By providing such activities, AMP students are better prepared to enter graduate programs or the workforce, whichever they choose. In addition, AMP students have more confidence in themselves and their ability to be successful. These students are AMP's best ambassadors.

Sullivan: There is no simple answer to this question. Rather, the answers will reflect the variety of approaches in our programs. However, the most important feature of the MAMP program is the effect of the spectrum of activities implemented, that is, empowered students.

AWARDS PRESENTED FOR VISIONARY LEADERSHIP

The project directors of the first six NSF Alliances for Minority Participation to be awarded funding in 1991 presented plaques to Dr. Luther Williams, Assistant Director; Dr. Roosevelt Calbert, Division Director; and Dr. William McHenry, Program Director, at the first Regional Conference on Diversity in Detroit, Michigan, November 18-21, 1996. Completing the first five-year phase of the AMP program, the project directors presented the plaques to the three pioneers in appreciation for "visionary leadership" in proposing, implementing, and sustaining one of the most successful Human Resource programs at NSF. The project directors, Dr. Louis Dale, Alabama AMP; Dr. Laurel Wilkening, California AMP; Dr. Richard Sullivan, Mississippi AMP; Dr. Manuel Gomez, Puerto Rico AMP; and Dr. Karen Watson, Texas AMP, have all received awards for Phase II AMP.



Dr. Anthony Garcia (SRM AMP) presents award to Dr. Roosevelt Calbert



Dr. Louis Dale (AAMP) presents award to Dr. William McHenry

FIRST AMP TEACHER PREPARATION WORKSHOP HELD AT FAMU

The first workshop for AMP teacher preparation project directors was held July 20, 1996, at Florida A&M University. The workshop theme was "Cooperation, Collaboration, and Partnerships: Ensuring a Diverse Science and Mathematics Teacher Workforce." Dr. William McHenry, AMP Program Director, and Dr. Roosevelt Calbert, Director of the Division of Human Resource Development, gave presentations on the state of AMP TP. Workshop highlights included a presentation by Dr. Terry Woodin, CETP Program Director, on AMP TP and the NSF Collaboratives for Excellence in Teacher Preparation, and a panel discussion on The Vision for Teacher Preparation, chaired by Dr. Roosevelt Calbert. Panelists were Dr. Robert Watson, Director of the Division of Undergraduate Education; Dr. Trevor Sewell, Philadelphia AMP; Dr. Antonio Garcia, Southern Rocky Mountain AMP; Dr. Gerunda B. Hughes, WBHR AMP; and Dr. Ana Piñero, Puerto Rico AMP.

NEW PUBLICATION PROVIDES FORUM TEACHER PREP DISCUSSIONS

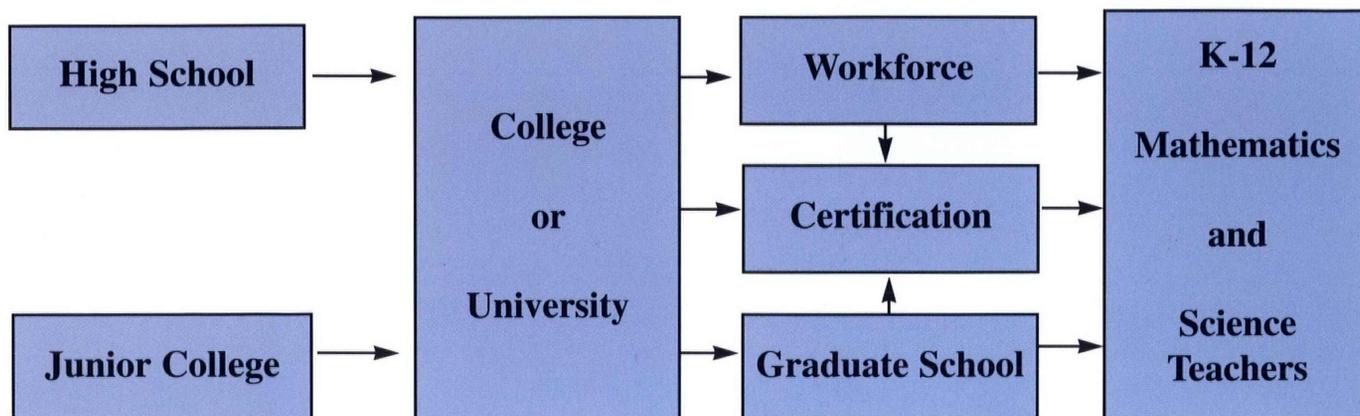
A new publication is on the scene. It's called **On The Mark** and it is "on the mark!" It is the official publication of the National Science Foundation Alliances for Minority Participation Institute for Science Teacher Preparation (TP), and the first issue was published this past February. The purpose of the publication is to provide a forum for discussion of current national teacher preparation reform efforts, data, and other information of interest to college and university faculty, administrators, K-12 teachers, and teacher preparation program directors; and to provide a mechanism for the exchange of ideas and information. Articles for publication should be sent to Dr. Carolyn Braswell, The University of Alabama at Birmingham, 401 Campbell Hall, 1300 University Boulevard, Birmingham, Alabama 35294-1170.

ON THE MARK

Alliances for Minority Participation Institute for Science Teacher Preparation • Winter 1997 • Volume 1 Number 1



INFLUENCING THE PIPELINE



AMP SCIENCE TEACHER PREPARATION PROGRAM TOUCHES THE FUTURE

The AMP program, under the direction of Dr. William McHenry, initiated in August of 1996, a Science Teacher Preparation Institute. The Institute is a collaborative effort of the Alabama, California, Florida-Georgia, Puerto Rico, All Nations, Southern Rocky Mountain, Philadelphia, and North Carolina Alliances and its goals are to: 1) increase the number of students from under-represented groups receiving mathematics and science baccalaureate degrees, and entering the teaching workforce; 2) provide opportunities for science, mathematics, engineering, and technology faculty to work with science and mathematics education faculty to develop and implement strategies to systematically remove barriers that prevent full utilization of talent from all groups in the science and mathematics teacher workforce; 3) develop new initiatives to attract students, particularly underrepresented minorities, to careers in mathematics and science teaching; 4) serve as a bridge between science and education faculty to ensure that both pedagogy and curriculum content are understood and utilized in science and mathematics teacher preparation programs; 5) develop a database on the current status of the science and mathematics teacher workforce; and 6) serve as a clearing house for information on high quality teacher preparation programs and activities.

The activities of the Institute will influence present and future science teachers. A Board of Directors consisting of Dr. M. Carolyn Braswell (The University of Alabama at Birmingham), Dr. William H. Castine (Florida A&M University), Dr. Antonio A. Garcia (Arizona State University), Dr. Manuel Gomez (University of Puerto Rico), Dr. Vallie Guthrie (North Carolina A&T State University), Dr. Colette Patt (University of California, Berkeley), and Dr. Trevor E. Sewell (Temple University) govern institute activities.

The Institute has a web site at <http://www.uab.edu/istp/>; an official publication entitled "On The Mark"; and sponsored a science teacher conference "Current Trends and Best Practices in Science, Mathematics, Engineering, and Technology Teacher Preparation Programs" in San Juan Puerto Rico, March 14-15, 1997.

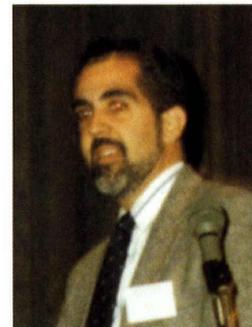
Board of Directors



Dr. M. Carolyn Braswell
Chair



Dr. William H. Castine



Dr. Antonio A. Garcia



Dr. Manuel Gomez



Dr. Vallie Guthrie



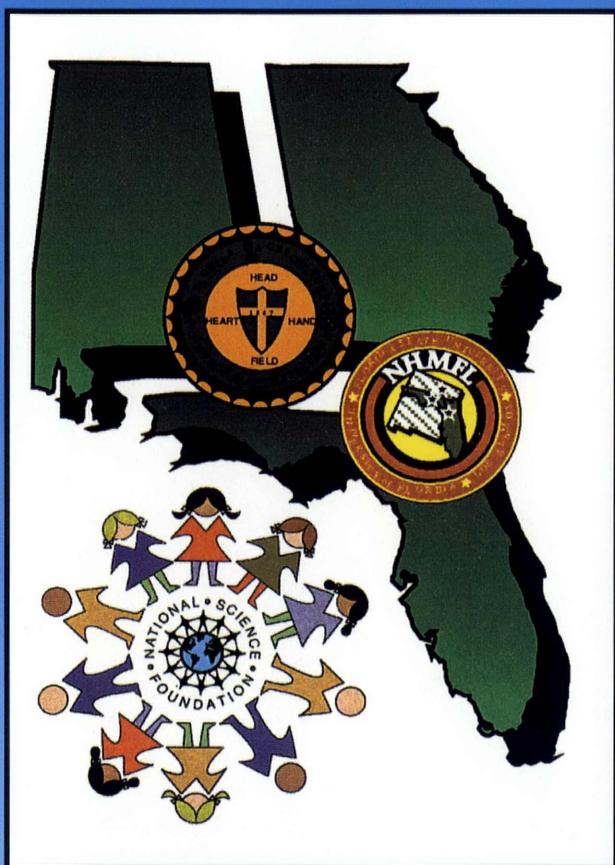
Dr. Colette Patt



Dr. Trevor E. Sewell

RESEARCH IS AN INTEGRAL PART OF THE EDUCATION OF THE NEXT GENERATION OF SCIENTISTS

The Fourth Annual National Science Foundation Alliances for Minority Participation Student Research Conference was attended by faculty and student representatives of 20 of the 26 AMP programs. Conference participants enjoyed presentations by Dr. Robert Schrieffer, Nobel Prize recipient in physics; Dr. Norman Thagard, former NASA astronaut; and Dr. Luther S. Williams, Assistant Director for Education and Human Resources at the National Science Foundation. In addition to a tour of the National High Magnetic Field Laboratory, participants witnessed 34 oral presentations by undergraduate students and 47 poster presentations. Other activities included a tour of Florida A&M University Black Archives, a tour of Tallahassee/Wakulla Springs State Park, and a delicious meal at the Awards Banquet.



THE FOURTH ANNUAL NATIONAL SCIENCE FOUNDATION ALLIANCES FOR MINORITY PARTICIPATION STUDENT RESEARCH CONFERENCE

*“Education &
Research:
Parallel Paths to
Excellence”*

**Florida A&M University
Tallahassee, Florida
July 20-22, 1996**

CONFERENCE HIGHLIGHTS



NASA Astronaut Presentation



Nobel Prize Winner



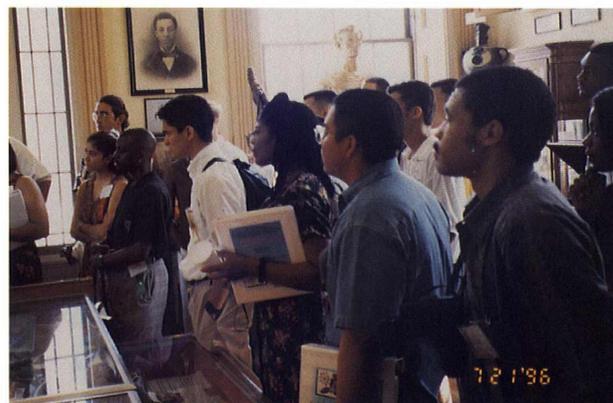
AMP students view posters



Project Directors' Meeting



Conference Organization



Conference participants visit Black Archives



SEM Graduate Student Panel



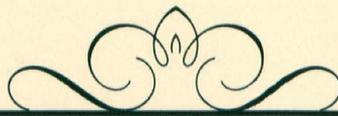
National High Magnetic Field Laboratory

McHENRY LEAVING NSF TO BECOME ASSISTANT COMMISSIONER

“Few professionals have served in such a challenging role; and even fewer have been as influential as Bill McHenry.”

Luther Williams

Dr. William E. McHenry, Program Director of the National Science Foundation Alliances for Minority Participation program, has been appointed Assistant Commissioner of Education for Academic Affairs by the Board of Trustees of Mississippi State Institutions of Higher Education. Dr. Luther S. Williams, Assistant Director, recruited McHenry to NSF for Education and Human Resources in 1991 from Mississippi State University where he served as Dean of the Graduate School. In addition to serving as Director of the AMP program, he served concurrently as Director of the Research Centers for Minority Scholars program until that program was phased out in 1995. He successfully directed the AMP program through the first five-year phase by assisting in the implementation of 27 AMP projects in 24 states, and Puerto Rico. He assisted Dr. Luther Williams and Dr. Roosevelt Calbert, Director of the Division of Human Resource Development, in making the AMP program one of the most successful programs in the Directorate for Education and Human Resources. McHenry is well respected by NSF personnel. “His contributions can be simply stated. He has been the principal translator of the AMP vision and program design into a national activity that currently occupies the unique position of being the most effective Federal Sector activity productively addressing the paucity of underrepresented minorities in science and engineering. Bill’s contributions have been transformational and, as a result, the quality of life of scores of racial and ethnic minorities is forever changed,” notes Dr. Luther Williams. His friend and colleague, Dr. William A. Sibley, states, “His dedication to students, organizational skills, and his persistent drive to make the AMP program successful, has been remarkable.” McHenry is a scientist. He has a U.S. patent (#4626528) on some of his work in chemistry and was selected as Outstanding Research Scientist at Mississippi State University in 1987. He received the Distinguished Service Award from the Patricia Roberts Harris Project Directors and the Outstanding Service Award from NSF for three consecutive years. His duties as Assistant Commissioner of Education for Academic Affairs will include oversight of academic programs at all state colleges and universities in Mississippi. “Dr. McHenry brings a wealth of experience that matches well with the academic strengths of the Institutions of Higher Learning,” said Dr. Thomas D. Layzell, Commissioner of Higher Education. McHenry is ready for the challenges of the new position. “My thirteen years at Mississippi State University, coupled with my six years at NSF, have provided me with the necessary skills and knowledge-base needed to assist the Institutions of Higher Learning in Mississippi to prepare students to compete in a global market. I am concerned with providing quality higher education opportunities for all students and committed to the challenge of being part of a system that is implementing activities and programs that are preparing students to compete in the 21st century,” said McHenry. He will become the highest ranking African-American in the State of Mississippi Education Administration.



**TRIBUTE TO
DR. WILLIAM McHENRY
NSF ALLIANCES FOR MINORITY PARTICIPATION (AMP) PROGRAM
1991-1997**



Dr. William McHenry

This particular journey for Bill McHenry as the Program Director for the Alliances for Minority Participation Program commenced upon my becoming acquainted with him during an Educational Testing Service meeting in New Jersey in 1990. His presentation at this particular meeting focused on databases and accountability. I said to myself, "This may be the perfect person for managing a major undergraduate initiative that was emerging at the National Science Foundation." Bill appeared to be mildly interested, but could not give a serious commitment to changing jobs. The thought of actually coming to the nation's capitol to work and leaving the great state of Mississippi would take a little more time. After conversations with his family and some prodding from NSF, he finally made the fateful decision to enter the federal workforce and expand his portfolio of work experiences. **The rest is history.**

Under Dr. McHenry's leadership, the AMP Program has become the paragon of what one man's dedication, persistence, and commitment can do to impact a significant increase in the number of minority students who successfully matriculate and earn baccalaureate degrees in science, mathematics, engineering, and technology. Somehow, it seems he was made for this position of helping this nation meet its need for a well-trained science and engineering workforce for the 21st century by using the talents from a diverse pool of American citizens. Bill deserves an abundance of accolades for his untiring and unselfish efforts.

All of us at NSF will miss Bill and we will long remember what he accomplished while he was here. We wish him the best of success in his new position.

Roosevelt Calbert

Division Director

Human Resource Development

Directorate for Education and Human Resources

AMP AWARD HISTORY

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1991	Alabama	The University of Alabama at Birmingham	Dr. Louis Dale
	California	University of California, Irvine	Dr. Elroy Rodriguez Dr. Laurel Wilkening
	Mississippi	Jackson State University	Dr. Richard Sullivan
	Puerto Rico	University of Puerto Rico	Dr. Manuel Gomez
	Southern Rocky Mountain Region	Arizona State University	Dr. Gary Keller Cardenas
	Texas	Texas A&M University	Dr. Carl Erdleman Dr. Karan L. Watson



Dr. Louis Dale



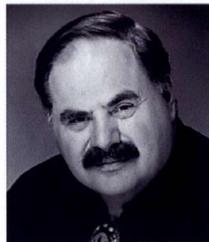
Dr. Laurel Wilkening



Dr. Richard Sullivan



Dr. Manuel Gomez



Dr. Gary Keller Cardenas



Dr. Karan L. Watson

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1992	Florida-Georgia	Florida A&M University	Dr. Lynette Padmore
	New York City	City University of New York	Dr. Fitzgerald Bramwell Dr. Neville Parker
	North Carolina	North Carolina A&T State University	Dr. Harold Martin
	South Carolina	University of South Carolina	Dr. Michael Howell
	University of Texas System	University of Texas at El Paso	Dr. Diana Natalicio



Dr. Lynette Padmore



Dr. Nevill Parker



Dr. Harold Martin



Dr. Michael Howell



Dr. Diana Natalicio

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1993	California State	California State University, Northridge	Dr. Alfonso Ratcliffe
	Chicago	Chicago State University	Dr. Dolores Cross
	New Mexico	New Mexico State University	Dr. Ricardo Jacquez
	Washington-Baltimore-Hampton Roads	Howard University	Dr. Clarence M. Lee



Dr. Alfonso Ratcliffe



Dr. Dolores Cross

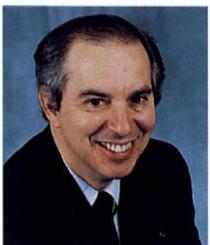


Dr. Ricardo Jacquez



Dr. Clarence M. Lee

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1994	Metropolitan Detroit	Wayne State University	Dr. Hanley Abramson
	All Nations	Salish Kootenai College	Dr. Joseph McDonald
	Greater Newark	New Jersey Institute of Technology	Dr. Harold Deutschman
	Oklahoma State	Oklahoma State University	Dr. Earl Mitchell
	Greater Philadelphia Region	Temple University	Dr. James England



Dr. Hanley Abramson



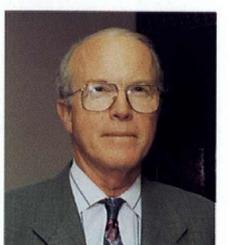
Dr. Joseph McDonald



Dr. Harold Deutschman



Dr. Earl Mitchell



Dr. James England

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1995	Louisiana	Southern University	Dr. Robert Ford
	Heartland's	University of Missouri-Baltimore	Dr. Charles Sampson
	Maryland System	University of Maryland Baltimore County	Dr. Freeman Hrabowski
	Mid-South	LeMoyne-Owen College	Dr. Andrea Miller
	Xavier/UNCF	Xavier University	Dr. Leonard Price



Dr. Robert Ford



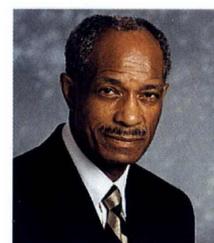
Dr. Charles Sampson



Dr. Freeman Hrabowski



Dr. Andrea Miller



Dr. Leonard Price

<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1996	Colorado	Colorado State University	Dr. Omnia El-Hakim
	Stony Brook	State University of New York	Dr. David Ferguson



Dr. Omnia El-Hakim



Dr. David Ferguson

DIRECTORY OF MINORITY SCIENTISTS IN AMP PROGRAM PUBLISHED

Seventeen of the twenty-six AMP project directors joined in a collaborative effort to publish a directory of minority scientists and engineers working in the AMP program. The directory includes African-Americans, Mexican Americans, Native Americans, Hispanics, and Puerto Ricans serving as faculty, mentors, administrators, and research scientists in the AMP projects. These scientists and engineers serve as a symbol to AMP students that "it can be done." The directory contains background information on 353 minority scientists and engineers. Copies of the directory may be obtained free of charge by contacting Alabama AMP at (205) 934-8771 or by e-mail at LDALE@uab.edu.

AMP ACCOMPLISHMENTS ARE VARIED AND IMPRESSIVE

Alabama AMP

- **AAMP DEGREE PRODUCTION EXCEEDS ITS GOAL!**
- The SEM bachelor's degrees awarded by year has increased 102%, from 437 to 882, exceeding the five-year projection in the original proposal. The minority SEM enrollment by year, starting with the baseline, indicates that AAMP enrollment has increased 87.3%, from 3,301 to 6,183.
- NSF Science Teacher Preparation grant awarded to AAMP to attract underrepresented minorities to teaching science and mathematics and to improve science teacher preparation
- Fourth Annual NSF National AMP booklet published by AAMP
- Three AAMP students won awards at the NSF AMP Student Research Conference in Tallahassee, Florida—Jacquelyn Collins, Monica Hagler, and Wendy Brittan
- Fourth NSF AMP Student Research Conference sponsored jointly by AAMP and Florida-Georgia AMP at Florida A&M University, Tallahassee, Florida
- NSF AMP Graduate Opportunities booklet published by AAMP
- DOE/EPSCoR and AAMP jointly sponsored second Internship Program at DOE/EPSCoR Research Clusters—The University of Alabama and Auburn University
- Second class of AMP Scholars graduated
- Directory of Minority Scientists and Engineers in the AMP program published by AAMP

California AMP

- Teacher Preparation activities initiated through teaching internships

- Internships at the Lawrence Berkeley Laboratory; Jet Propulsion Laboratory; Argonne; Genentech; MIT; Harvard University; Apple Computer; Amgen, Inc.; Toshiba America; Microsoft, Inc.; Intel; Dow Chemical
- MESA partnership expansion at UC Davis and UC Santa Cruz
- Statewide Community College Summer Institute, serving 99 students from 35 colleges
- *Through The Eyes of Scientists* Transfer Student Conference
- CSU commitment met: 1996 pilot of Internet electronic student resume form and companion database of internship/research opportunities and related summer employment
- Graduate School admission of first cohort of CAMP graduates, including admission to Harvard, MIT, Stanford, Berkeley, and interviews at Yale, Cornell, and Michigan
- Special presentation to the National Science Board
- Publication by Jones and Bartlett Publishers, *Science Writing Through Critical Thinking*, student handbook and instructor's guide
- Development of the *CAMP Quarterly*
- Co-Sponsor, UC Mathematics, Science, and Engineering Faculty Conference on Undergraduate Education; published proceedings

California State University AMP

With additional support from the National Aeronautics and Space Administration, the California State University Alliance for Minority Participation was able to increase its summer workshop program by almost 20% to a total of over 1,400 students at freshman and sophomore levels. As a consequence,

first-time minority freshman enrollments in science, engineering, and mathematics rose 5% from the Fall of 1995 to the Fall of 1996, while transfer student enrollment rose 7.6% in that same interval. The total enrollment of targeted minority first-time freshmen was 1,916, while new transfer student enrollments rose to 1,065. The total enrollment of targeted minority undergraduate students in science, engineering, and mathematics rose to 12,390 from 11,693 in 1995's Fall semester. The retention of our minority AMP 1994 Fall cohort in SEM was 81%, while non-minority student one-year retention was only 72%, 9% less than our success rate. Prior to AMP, e.g., 1993-1994, retention for targeted minority students was only 69%, i.e., 12% lower than the level achieved by our students one year later.

Chicago AMP

- In 1996, ChAMP expanded in both size and scope. The number of participating institutions tripled, bringing the total number of partners to 18. Greater emphasis has been placed on the recruitment of community college students, the preparation of pre-service SMET teachers, and increasing undergraduate research in education. In addition, three new components—Teacher Preparation, Community College, and Social Sciences—were added to strengthen collaborative agreement.
- In October, 1996, ChAMP added the Teacher Preparation component. An integral part of the Teacher Preparation component is the newly created state-of-the-art Science Teacher Assistance Center (STAC).

STAC serves as a valuable resource for the Chicago educational community, including teachers; parents; college faculty; pre-service and in-service teachers; and community organizations. The STAC Center invites teachers to participate in on-site professional development workshops.

- Spring 1997, ChAMP was awarded a planning grant for the implementation of the Social and Behavioral Sciences into SMET activities.
- The addition of Alliance partners, Teacher Preparation and Social Science components, places ChAMP in a unique position to significantly impact and increase the quantity and quality of minority students receiving baccalaureate degrees in the SMET disciplines. These components enable ChAMP to maximize its potential to further impact minority participation.

🌀 Colorado AMP 🌀

Since its inception on November 1, 1996, the Colorado Alliance for Minority Participation has achieved the following:

- Established a cooperative agreement between Colorado State University and the National Science Foundation
- Completed the first round of CO-AMP funding with subcontracts going to four community colleges, one junior college, and six, four-year colleges and universities in Colorado and the Four Corners region
- Employed a program manager, evaluator, and staff for CO-AMP Headquarters at Colorado State University, Fort Collins, and a second office at Fort Lewis College, Durango
- Conducted site visits to each of the 11 institutions and the tribal communities by the project director and program manager
- Began implementing CO-AMP

activities, workshops, and scholarships at participating institutions

- Developing and advertising upcoming Summer Bridge programs at participating institutions
- Held the first Annual CO-AMP Conference/Site Coordinator Workshop at Fort Lewis College
- Held the first Governing Board meeting at Colorado State University chaired by Dr. Albert Yates, President of Colorado State University, and attended by representatives from the State of Colorado Governor's office; presidents and officials from the participating institutions; and members of the four tribal partners
- Held a Management Team Retreat to develop both short term- and long-term strategic plans
- Participation in the National AMP and Teacher Preparation meetings by the project director
- Created a yearly calendar for all upcoming Governing Board, Steering Committee, Management Team, and National AMP meetings and NSF deadlines
- Created CO-AMP Website (<http://www.coamp.colostate.edu>)
- Developing a teacher preparation proposal to serve Colorado and Four Corners region

🌀 Florida-Georgia AMP 🌀

In 1996 the Florida-Georgia AMP achieved a major goal, that of graduating more than 1,100 B.S. SEM majors from participating institutions. This total more than doubles the Alliances baseline of SEM graduates. The focus on internship experiences continues to drive the academic performance of the FGAMP scholars since students recognize that internships are offered on a competitive basis and that research experiences influence graduate program selection. In the summer of 1996, the FGAMP institutions which support undergraduates, placed 98 students in internships supported from

non-FGAMP sources. The Alliance is indebted to the partners who continue to provide funding for summer experiences. The annual FGAMP EXPO continues to draw a significant number of industry and graduate program partners who provide crucial career-related information to our students.

🌀 Heartland's AMP 🌀

The Heartland's Alliance for Minority Participation made significant strides in the initial year.

- Undergraduate degree production increased by 48% in the first year, which nearly equals the expected *third-year* projection.
- Graduate degree production increased by 76 %.
- HAMP was awarded \$81,000 (toward a four-year total of \$402,000) to enable member institutions to establish a Math and Science Teacher Preparation program for underrepresented minority students.
- HAMP was awarded \$23,000 to hold a conference to develop plans for incorporating a social and behavioral science component into the HAMP program.
- Passage of Senate Bill 805 by the Missouri General Assembly in 1996 directed the Missouri Department of Natural Resources to establish a scholarship program for underrepresented students in undergraduate and graduate programs.
- HAMP co-sponsored a graduate recruiting fair on the University of Missouri-Columbia campus, along with the University of Missouri System and the University of Missouri Graduate School. Nearly 1,000 students attended this first-time event.
- HAMP provided summer "bridge" experiences for 125 students at 6 member institutions.
- HAMP facilitated collaborative learning and orientation programs at HAMP institutions.
- HAMP developed a post-baccalau-

reate special program for promising students with insufficient SEM undergraduate experiences.

Metropolitan Detroit AMP

- During the 1995-96 academic year MDAMP was able to continue the positive momentum started during the 1994-95 academic year. Some of the accomplishments worth noting would include the first annual fall semester kickoff picnic. Our turnout was small but the possibilities for a better picnic experience in the future are high.
- The EDS Corporation gave MDAMP \$2,000 in support of student travel to the 1996 Argonne symposium. Thirteen (13) MDAMP students attended the symposium and six (6) presented their research.
- Seven (7) MDAMP students attended the First Annual Chicago AMP Student Research Conference.
- At the Fourth Annual National Science Foundation AMP Student Research Conference two of our students, Mike Hogan and Charlotte Young, presented their research in the areas of mathematics and chemistry, respectfully. Ms. Young's presentation on *The Effect of Molecular Architecture on the Thermotropic Behavior of Side-Chain Liquid Crystalline Polymers and its Relation to Polydispersity* earned her first place in the physical science oral competition.
- Over 20 AMP students from the Chicago AMP, Heartland's AMP, and MDAMP participated in the 1996 NSF Regional Diversity Conference held here in Detroit.
- MDAMP was most fortunate to be able to support the guest lecture visit of Dr. Uri Triesman, Professor of Mathematics from the University of Texas-Austin and MacArthur Fellow, who spent the better part of a day and a half lecturing and discussing, in a small group format, his

cooperative learning program in calculus. Mathematics faculty and high school teachers participated in this MDAMP-wide activity.

Mid-South AMP

- Increased the number of B.S. degrees awarded to minority students in science, mathematics, engineering, and technology disciplines by 37.4%; from 195 in 1994-95 to 268 in 1995-96
- Established the 1996 Summer Bridge Program, Research Internship Program, and Business and Industry Internship Program with the assistance of Memphis Partners, Inc.
- Established the MAMP homepage on the World Wide Web/Internet at <http://www.mecca.org/MAMP/mamp.html> with links to other AMP homepages. Christian Brothers University developed an additional homepage for their MAMP students.
- LeMoyné-Owen College received a grant for \$100,000 from the Packard Foundation (Dr. M. I. Shafi, Director) for additional scholarship support for MAMP students.
- MAMP students at the University of Memphis and other MAMP institutions attended a public lecture given by Dr. Peter Doherty, winner of the 1996 Nobel Prize for Medicine for his research on MHC restriction of T-cell recognition of foreign antigens. Dr. Doherty is a researcher at St. Jude Children's Research Hospital in Memphis, Tennessee. This event, held February 27, 1997, was sponsored by the College of Arts and Sciences at The University of Memphis.

Mississippi AMP

- One very significant accomplishment for the Mississippi Alliance for Minority Participation in 1996 was the near **doubling of its minority**

graduates in SMET disciplines, with 571 graduates in 1996 compared to 288 in 1991!

- Delta State University developed a "Navigators" program wherein MAMP students serve as mentors to incoming freshmen and transfer students, helping them adjust to life at DSU.
- Mississippi State University/IMAGE students have developed a real sense of community which is fostered by participation in a bi-weekly seminar where they meet other students and share experiences in education and research.
- The morale of SMET students has improved significantly at Mississippi Valley State University due in large measure to the increased number of IMAGE students who have research and internship experiences, 55 students in 1996, up from 18 in 1992.
- The University of Mississippi has begun a Student Empowerment and Leadership Development program that has led to a community of IMAGE students who participate in decisions affecting the IMAGE program at UM including program designs, reviews, additions and changes.
- Alcorn State University has seen a significant increase in student participation in several areas including the Summer Bridge Program, internships, and scientific presentations at the Annual Meeting of the Mississippi Academy of Sciences.
- Internships tripled at Mississippi University for Women.
- Based on overall GPA, the University of Southern Mississippi awarded 104 MAMP scholarships to SMET students, a record number.

All Nations AMP

- The All Nations AMP sponsored the College Science Bowl and the Science Poster & Oral Showcases at the 1997 AIHEC National

Conference. Twelve (12) schools participated in the Science Bowl. Twenty-eight (28) students participated in the poster & oral presentations.

- ANAMP sponsored the 1996 AISES National Conference Poster & Oral Presentations in Salt Lake City. In 1997, the AISES National Conference will be held in Houston and ANAMP will again sponsor the popular Poster & Oral Presentations.
- The All Nations AMP collaborated with AIHEC, the Lannan Foundation, and the Tribal College Journal to facilitate the Native Research & Scholarship Symposium. The focus of this symposium was fundamental self-determination for tribal colleges and the communities they serve.
- The Montana Math and Science Society (MMASS) Board has recently included ANAMP and HPRSI as action items under their Systemic Strategies and Recommended Actions to: strengthen the current state assessment systems to track the progress of female and Native American students; support the activities of the High Plains Rural Systemic Initiative and ANAMP in the systemic reforms being pursued at the tribal colleges and school systems on the seven Montana Indian reservations; and to continue to provide summer opportunities for students and teachers in Native American schools to investigate exciting aspects of science and mathematics and to participate in bridging courses that help in the transition from high school to college and from a tribal college to a university.

🌀 New Mexico AMP 🌀

New Mexico AMPs year was marked by three significant achievements: 1) The New Mexico AMP Distance Learning Program (DLP) introduced an innovative introductory level course, SMET 101, "Introduction to

Science, Mathematics, Engineering, and Technology," in Spring 1997 to promote interest and enthusiasm in students intending to pursue a B.S. degree in SMET. The course was designed to be transmitted live via satellite from NMSU and to incorporate specifically trained on-site facilitators. 2) New Mexico AMP continues to lead the state in developing articulation agreements that facilitate the transfer of minority students from the state's two-year colleges to one of six, four-year universities. A New Mexico AMP Articulation Guide describing the articulation process and providing a replicable model for pursuing and developing articulation agreements is nearing completion. 3) A donation of computers and printers from Apple Computer, Inc. to the New Mexico AMP became the foundation for the *Apple Center of Excellence* at New Mexico State University. This joint venture is the beginning of what is hoped will be a long-term relationship among New Mexico AMP, NMSU, and Apple to include student internships, curriculum development, and training on the MacIntosh platform.

🌀 New York City AMP 🌀

- Increases in underrepresented minorities SEM enrollment (49%), baccalaureate degree production (34%), and associate degree production (60%) over our baseline data
- Central NYC AMP office assisted in the preparation of the following successful grant proposals: NSF (DUE) Chemistry Workshop Project; NASA Institute on Climate and Planets; NASA Science and Technology Teachers for the Next Millennium; NASA Minority University Space Interdisciplinary Network; and NASA Global Climate Variability.
- NYC AMP student participation totals for 1992-1996 inclusive: 259 research scholars, 311 peer tutors, and 98 faculty mentors

- NYC AMP SEM Research Articulation Program (SEMRAP)—a cadre of senior research faculty undertake research projects with faculty and students from community colleges. Five of seven SEMRAP projects have received supplemental funding from other sources.
- Formulation, implementation, evaluation, and dissemination (local and national) of multimedia courseware based on NASA research
- NASA Network Resources and Training Site (NRTS)—NRTS's objective is to build and maintain internet connectivity for predominantly minority universities and elementary and secondary schools.

🌀 North Carolina AMP 🌀

- Core curriculum developed to enhance performance of minority students in the General Engineering/Freshman Curriculum: Introduction to Engineering, Computer Programming, and Graphics courses—resulted in an increased passage rate from 65% before implementation to 80% subsequent to implementation.
- Engineering, mathematics, and science self-help supplemental instruction for minority freshmen yielded exceptional results in increased student success.
- Successful implementation of a bridge program impacting approximately fifty (50) students
- Hosted the First Annual Undergraduate Research Conference
- Among participating campuses in the CCRCA program, approximately 20% fewer students withdraw from targeted calculus courses and CCRCA-trained faculty are experiencing at least a 10% increase in the number of students passing their technology-supported classes.
- Successful implementation of a wide range of programs to support minority students pursuing B.S. degrees in SMET disciplines—Among the major student support

programs and services are:

- Supplemental Instruction and Tutorial Services in “gatekeeper” calculus, chemistry, and physics courses
- General Engineering Freshman Core Program
- Computer Application Assistance
- Peer Study Groups
- Summer Research Program
- Faculty Mentoring Program
- Industry Internship Program
- Internships at National Research Laboratories
- Summer Bridge Programs
- NCAMP Scholarship Program

🌀 Oklahoma AMP 🌀

- Jade Vardeman and Carrie O’Leary, Northeastern State University (NSU) Scholars, helped start “The Science Clan” which offers science presentations at regional schools having a high enrollment of American Indian children.
- OKAMP-NSU and Research Experience for Undergraduates Scholar, John Callaway, ranked one of the top four and received a prize for a presentation of the results of his computer science project at the National Association of Computing Machinery Convention in Philadelphia.
- At East Central University, Dr. Bill Walker and a team of students including OKAMP Scholars Randy Austin and Steve Carter, developed **Coyote**, a software system. **Coyote** allows the newly created written language for the Comanche Indian Tribe to be used in a computer-assisted environment.
- Paul DeLa Cerda, OSU Scholar, received the Academic Excellence and Leadership Award from the College of Engineering. Other Scholars reported receiving awards and/or honors were Cara Cowan (engineering), Kristi Perryman-Dyer (science education), Faron

Kirby (biology), Jennifer Wright (engineering), Anthony Hackner (engineering), and Mark Cytus (engineering).

- OSU Research Intern Brian Murray (engineering), and his mentor Richard Bunce, an organic chemist, published an article in *Organic Procedures International*, 28(1), 115, January 1996. Quannah Harjo (computer science) along with mentor, Dr. John Gelder, wrote a computer program for teaching “Gas Laws.” Thomas Jones (biochemistry), and mentor Dr. John Bantle, gave a presentation at the Oklahoma Academy of Sciences.
- Awarded Teacher Preparation Supplement, Fall 1996
- OKAMP sponsored two Summer Bridge Programs: non-residential by Langston University and residential by Oklahoma State University.
- Second Alliance-wide Research Internship Program Poster Session-The number of posters presented increased from 14 in 1995 to 35 in 1996. Introduced oral presentation format

🌀 Greater Philadelphia 🌀 Region AMP

- The Alliance has benefited from the efforts of Community College of Philadelphia and Temple University faculty under the Collaborative for Excellence in Teacher Preparation (CETP), which resulted in the redesign of entry level biology, chemistry, environmental engineering, and mathematics courses. The new courses are designed to foster both cooperative learning and learning by inquiry.
- Delaware State University constructed a new \$13 million science center complex.
- Drexel University’s College of Engineering was named in the top 25 Engineering Schools in the United States by *U.S. News and World Report*.

- At institutions like Temple University, transfer students represent about half of all new students, even more for minority students. A new AMP concurrent enrollment program at Temple, which started with four (4) Community College of Philadelphia students in the Spring of 1996, was adopted as a model by the university.
- University of Pennsylvania, School of Engineering and Applied Science graduated five (5) African-American Ph.D. and two (2) Hispanic Ph.D. students in engineering between May and June of 1996.

🌀 Puerto Rico AMP 🌀

- The number of B.S. graduates increased from 2,281 in 1994-95 to 2,674 in 1995-96, surpassing our original goal of 2,646 degrees for that year.
- An increase of 17% in SMET enrollment, from 16,344 in 1994 to 19,139 in 1995
- A significant increase in graduation rates at two alliance institutions—UPR-Mayaguez increased its graduation rate in engineering from 53% to 76%. For science and mathematics students at the same institution, the graduation rate went from 40% to 47%. At UPR-Humacao, the graduation rate for science and mathematics students increased from 28% to 42%.
- The number of times a student needs to repeat a SMET course to satisfactorily pass it (Index of Course Efficiency) was reduced from an average of 3 to an average of 1.5 in the main Alliance institutions.
- Student participation in undergraduate research increased from 204 in 1994 to 289 in 1995, a 42% increase.
- The implementation of a permanent collaborative strategy between the colleges of Education and Natural Sciences to implement a teacher preparation component to actively

recruit and certify physics, chemistry, and mathematics teachers. In 1995, 61 students participated in this program, and 27 were certified as teachers in these disciplines. Also, 42 current science and mathematics teachers who had been teaching physics courses without the required certification were prepared to be certified in this discipline.

South Carolina AMP

The South Carolina AMP had many outstanding accomplishments during the 1995-96 year. For the second consecutive year, the South Carolina State Legislature awarded the SCAMP program \$600,000 to help fund student participant activities. The South Carolina AMP was also awarded additional support from the National Science Foundation to fund the SCAMP - Teacher Preparation component. Other noticeable accomplishments include University of South Carolina mechanical engineering senior, Michael Boone, being awarded the prestigious Barry M. Goldwater Scholarship. Also, two SCAMP students, Michael Boone of USC and Cheryl Grant of the College of Charleston, were awarded First Place at the 1996 NSF AMP Student Research Conference held in Tallahassee, Florida. As proven each summer, students who participated in the Summer Bridge/Math Excellence Workshop programs scored significantly higher in calculus courses as compared to non-bridge students. Thirty-one (31) students participated in summer research at SCAMP institutions and also competed in the second annual SCAMP Summer Research Science Fair. This year's fair was sponsored by Owens-Corning Insulation, North American Division. Three students were awarded a \$500 scholarship for their research presentation: Michael Boone - USC, Redick Brown - SC State University, and Jamie Lewis - College of Charleston

University of Texas System AMP

- The UT System AMP held a major conference "Creating Pathways for Student Success" on July 12, 1996, on the UTEP campus. More than 100 attendees from AMP institutions, including presidents and provosts, and representatives from Texas, Oklahoma, and New Mexico AMPs participated. Keynote addresses were presented by Shirley Malcom and Sheila Tobias.
- Development of a generic brochure and application form that can be adapted to the individual needs of UT System Alliance institutions
- Faculty development seminars and conferences on all Alliance campuses
- Curriculum development activities where the faculty of the Alliances network to exchange ideas and information
- Summer Bridge expansion between four-year and two-year colleges providing added flexibility and degree options for the transfer students
- Seven (7) students representing the UT System AMP presented their research at the National Science Foundation AMP Research Conference at Florida A&M University in July 1996.
- Dionne Bailey, from UT Pan American, co-authored a paper on knot theory. She is now a doctoral student in mathematics at Emory University.
- At UT Pan American, Gilbert Ochoa presented a paper at the Society of Computer Simulation meeting in January 1996, and Armanda Ramirez presented a paper at The Society for Engineering Education in March.
- Jose Alonso from UT El Paso published a paper in the Proceeding of the Annual Conference of the Silicon Valley Ergonomics Institute held in May 1996.
- In October 1996, Anna Mussiett of UT El Paso presented a paper at the Annual Meeting of the Society for

the Advancement of Chicanos and Native Americans in Science.

19 AMP PROJECTS HIGHLIGHT PROGRAM EFFECTIVENESS

Continued from page 7

participating partner universities and community colleges.

The UT System AMP held a conference "Creating Pathways for Student Success" on July 12th. The conference focused on the importance of diversity in education and the workforce and curriculum reform in freshman-level courses. More than 100 presidents, provosts, and representatives from Texas, Oklahoma, and New Mexico AMPs were in attendance. 42 current science and mathematics teachers who had been teaching physics courses without the required certification were prepared to be certified in this discipline. The UT System AMP is retaining and graduating students in SMET fields. As of fall 1995, 52% of the bridge students have graduated or are currently enrolled in SMET programs. In 1995-1996, completed baccalaureate SMET degrees increased by 49% over year one. Forty percent (40%) of the SMET students who have graduated are now enrolled in graduate school.

Important dimensions of the UT System AMP program effectiveness are student research achievements and awards. Seven (7) students representing the UT System AMP presented their research at the National Science Foundation AMP Student Research Conference at Florida A&M University in July 1996. UT Tyler held a Research Conference and Exhibit to present the AMP students' projects. Throughout the past year several students in the UT System AMP presented papers at the regional meetings of the American Physical Society, the American Association for Physics Teachers, the Southwest Association of Naturalists, the American Association for Engineering Education, and the Student Conference on Mathematics and Applications.

Alabama

Alliance for Minority Participation



**Fifth Anniversary
1991-1996**

***Increasing the Quantity and Quality
of minority students receiving degrees in science, engineering, and mathematics***

The Alabama Alliance for Minority Participation Program began in 1991 with eight Historically Black Colleges and Universities and The University of Alabama at Birmingham. Conceived and initiated by ten Black faculty members at these institutions with Ph.D. degrees in mathematics and science, the Alliance had a single goal of significantly increasing the number of minorities receiving bachelor degrees in science, engineering, and mathematics in Alabama and parts of Mississippi. Today the Alliance membership has increased to twelve and includes all of the major colleges and universities in Alabama.

Alliance Programs

- AMP Scholars
- Research Internships
- Summer Bridge
- Graduate Bridge
- Science Teacher Preparation
- SEM Drop-In Center
- AMP Mentoring
- Faculty/Student Conference
- AMP Research Outreach

Alliance Partners

- Alabama A&M University
- Alabama State University
- Auburn University
- Miles College
- Oakwood College
- Stillman College
- Talladega College
- Tougaloo College
- Tuskegee University
- The University of Alabama
- The University of Alabama at Birmingham
- The University of Alabama in Huntsville

Program Results	Year	1991	1992	1993	1994	1995	1996
	Bachelors	437	613	603	668	757	882



In their varied forms, UC programs motivate participants through cooperative learning, internships, research, and travel to professional conferences. Laboratory research is recognized as a pivotal experience, encouraging students to apply scientific knowledge. It is the platform for graduate education and influences career choices. CAMP students statewide win top honors in oral and poster presentations at a variety of professional society meetings. Student achievement is highlighted in the CAMP QUARTERLY.

THE UNIVERSITY OF CALIFORNIA *Leading Students into the 21st Century*

1995-96 Selected Achievements:

- Increase in student co-authored publications
- Undergraduate top academic and research awards
- Statewide transfer institute serving 35 community colleges
- Teacher Preparation K-12 classroom-based internships
- *Through The Eyes of Scientists* Conference at UCI
- CAMP/MESA Math, Science and Engineering Day
- Internet student resume and internship database
- Special Presentation to The National Science Board
- Publication of *Science Writing Through Critical Thinking*
- Development of the *CAMP Quarterly*
- Internships at National Laboratories
- Graduate school admission at renowned institutions

Technology Benchmarks

- IRT: Individual Referenced Testing protocol
- The electronic student resume/database
- UCLA computer lab, donated by IBM
- UCI computer lab update, including LCD
- WWW CAMP Home Page & Electronic Resume
- WWW Calculus Solutions Home Page



Above, Summer Science Fellowship Program at UC Santa Cruz: MESA (Mathematics Engineering Science Achievement) students preparing to transfer to UC.

Left, High-achieving UCI junior Mariella Kabar is presented a CAMP-TOSHIBA AMERICA scholarship by Toshiba representative Darrell Lynn.

CAMP IS ADMINISTERED AT UC IRVINE:

Laurel L. Wilkening, Chancellor
Frederic Y.M. Wan, Vice Chancellor
Co-Principal Investigators

Manuel N. Gómez, Vice Chancellor
Statewide Director

Marjorie DeMartino
Statewide Associate Director

Berkeley • Davis • Irvine • Los Angeles • Riverside • San Diego • Santa Cruz • Santa Barbara

E-Mail: CAMP@UCI.EDU
<http://www.camp.uci.edu/~camp/>

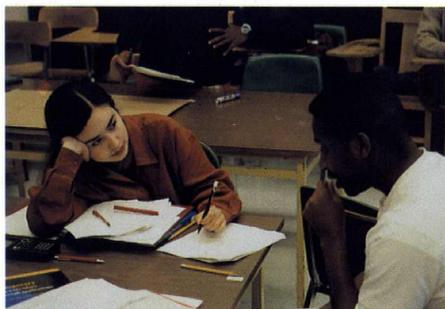


The California State University Alliance for Minority Participation (CSU AMP)

The CSU AMP is composed of eighteen campuses of the twenty-two current members of the California State University system and twenty-two of the one hundred and seven public community colleges.

The core of the program is a two-year commitment of freshmen to take part in summer workshops for four weeks in each of two successive summers and to participate in semi-weekly science or mathematics workshops during the academic years. There is a stipend for each of the summer workshops.

In the first summer and the first academic year, the workshops focus on mathematics at the calculus or pre-calculus level and on the methods of collaborative study, time management and familiarization with the



University, including meeting the faculty in SEM. In the second summer and academic year, the focus of the workshops is on one or more of the major areas in science - i.e. chemistry, physics or biology - and on mathematical applications.

The academic year workshops are open to all students, with the emphasis on the original summer students, encouraging other AMP eligible stu-

dents to join in and accepting any other students for whom there is room. All students are encouraged to take the collaborative ideas and expand them to other courses and disciplines that the AMP is unable to support.



The summer sessions are selective because of the cost, but there is an educational rationale as well: if there is a greater demand than the schools can accommodate, the selection of the students from AMP can be based upon their cooperation and their progress in their majors. These constraints can be used to encourage the students to perform in ways which will lead them to success in school and in their professions. The CSU Alliance has matured with respect to recruitment, operating summer workshops, and establishing the full range of academic year workshops as originally planned. The new challenges are a greater increased effort to identify research and internship opportunities for undergraduates. CSU Sacramento annually compiles one such list of summer opportunities, and the AMP project directors distribute copies to all forty campuses of the Alliance. A Memorandum of Understanding exists between the CSU AMP and CAMP (the University of California Alliance based at UC Irvine) to maintain a joint database of students in both AMP programs who wish to be considered by researchers at the campuses for summer (or other) research opportunities. We are seeking to increase the use of this database. Since we do not

anticipate being able to obtain slots for all the 6,000 or more upper division minority students in SEM, we are using such opportunities as a further incentive for our students to perform well in their lower division studies.

We have a Teacher Preparation Supplement from NSF, and plan to build on that to provide even more career alternatives for minority undergraduates with an interest in mathematics and science. Minority undergraduates in education, and/or SEM will have paid opportunities to work with teachers of mathematics and science in California Public schools and later, the opportunity to prepare as teachers in those fields.



CSU AMP ADMINISTRATION
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 California State University

Principal Investigator
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 Dean Emeritus
 College of Engineering and Computer Science
 CSU Northridge

Executive Director
 Tobi A. Roffman
 College of Engineering and Computer Science
 CSU Northridge

Fiscal Management
 San Francisco State University



Chicago Alliance for Minority Participation NATIONAL SCIENCE FOUNDATION

INFORMATION ABOUT OUR CHICAGO ALLIANCE

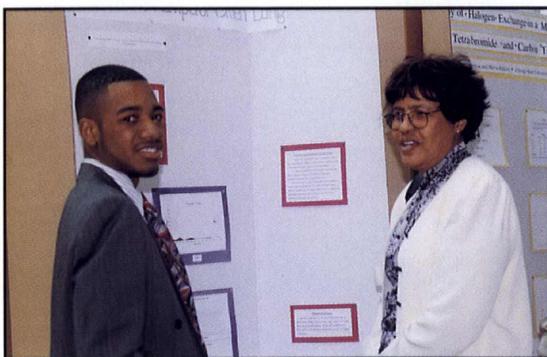
Chicago AMP consists of nine (9) Chicago Universities; nine (9) community colleges and research organizations participating in a collaborative effort to provide programs that improve the quality of science, mathematics, engineering and technology education for minority students. Each of these organizations has made a commitment of faculty, staff, research facilities and technical assistance to ensure successful opportunities for students participating in the ChAMP program.

The mission of ChAMP is beyond the capabilities of a single institution. The scope of this program demands that institutions communicate, collaborate, and build on innovative initiatives. A key strategy of the Chicago Alliance is to build upon the pre-existing network among the schools so all students and faculty can take advantage of the most successful programs offered at each institution. Activities at participating institutions include:

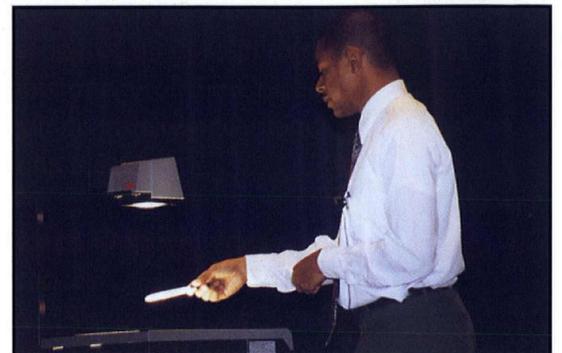


- Hands-on Research Opportunities
- Science Conferences
- Facilitated Study Group Sessions
- Professional Development Workshops
- Peer Mentoring Activities
- Summer Bridge Programs
- Tutoring Programs
- Internships
- Financial Aid/Tuition Waiver

Students as well as faculty have benefited greatly from the inter-institutional nature of ChAMP. Such interactive and cooperative activities give the Alliance a synergy that would not exist if these programs operated in isolation.



The specific goal of the ChAMP is to quadruple the number of undergraduate and graduate degrees awarded to underrepresented minorities in science, mathematics, engineering and technology by the year 2000.





THE COLORADO ALLIANCE FOR MINORITY PARTICIPATION (CO-AMP), was established on November 1,

1996, through a five-year cooperative agreement funded by the National Science Foundation. CO-AMP is a collaborative effort comprised of four community colleges, one junior college, and six four-year colleges and universities, and several corporations, governmental agencies, professional membership organizations, and community members. The Alliance is also proud of the partnerships that have been established with four tribal nations—Jicarilla Apache, Navajo, Southern Ute, and Ute Mountain Ute—located in the Four Corners region of Colorado, New Mexico, Arizona, and Utah. Colorado State University administers the funds that are shared among the participating institutions.

The primary goal of **CO-AMP**, a multidisciplinary, comprehensive undergraduate program, is to substantially increase the quantity and the quality of education for American Indian, African-American, and Hispanic students receiving baccalaureate degrees in science, mathematics, engineering, and technology.

OTHER CO-AMP GOALS:

- **RECRUITMENT:** to help increase the number of high school and community college students recruited for SMET disciplines;
- **TRANSITION:** to facilitate smooth transition from two-year community colleges to four-year colleges and universities, and from academia to professional careers;
- **RETENTION & MENTORING:** to offer both professional and personal support, and leadership development, through a variety of activities and programs;
- **RESEARCH:** to provide access to undergraduate research experiences that help develop professional skills, critical thinking, and leadership awareness;
- **GRADUATE SCHOOL:** to increase the number of CO-AMP students entering graduate schools to attain a doctorate degree;
- **FACULTY PROFESSIONAL DEVELOPMENT:** to enhance the professional development of faculty involved with programmatic activities.

CO-AMP's continuing goal is to institutionalize its activities by linking public and private sector resources through structured funding and program development strategies.

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Colorado State University

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Center for Science, Mathematics, and
Technology Education
Colorado State University



Florida-Georgia Alliance for Minority Participation

Since 1992, the Florida-Georgia Alliance for Minority Participation (FGAMP) has used a holistic approach to influence the graduation rates of science, engineering, and mathematics majors at the participating institutions. Activities implemented to impact students' persistence and progression in the major include: summer bridge programs, peer study groups, faculty-directed undergraduate research projects, undergraduate summer research, institutes for graduate school preparation, faculty and peer mentoring, and graduate level mentorships.

FGAMP has accepted the challenge of providing avenues to prepare science, engineering, and mathematics graduates for the 21st century and beyond. The programmatic structure of FGAMP provides for interaction and collaboration among various groups of academia—students, faculty and administrator. This combination has generated a high level of enthusiasm among all parties. The development of a sense of cohesiveness is essential in order that all benefit from the explosion of knowledge in the SEM fields and, at the same time, serve a diverse population of students in their chosen careers. The FGAMP model execution of the SEM curricula has proven to be successful for FGAMP participants. Several other enhancement programs have incorporated the prematriculation institute and are also requiring summer internships of their majors. Faculty participate in the summer bridge institute and are active with students' special projects and research endeavors and with the FGAMP EXPO. Thus, FGAMP exists as a catalyst promoting greater collaboration among the SEM groups. The emphasis on research-focused internships and the annual FGAMP EXPO have influenced students to excel in their classes.

Information relative to the project is disseminated by way of brochures, newsletters, conferences, and workshops. The FGAMP also sponsors biennial regional conferences. The Alliance has linked with key prematriculation programs designed to prepare students for SEM careers. The Alliance serves to build a community of individuals bonded by: a sense of mission, a commitment to excellence, and the dedication to serve students.

The majority of the institutions in the Alliance have met their individual graduation goals by using a systemic approach which empowers both students and faculty. Services available through the FGAMP are extended to all interested SEM majors. We are encouraged that efforts of the coalition in promoting collaboration and of key partners supporting the Alliance have influenced the increase of SEM graduates at the participating institutions from 416 to 1,124 in 1996. The first cohort of students to receive the full exposure of the FGAMP 'principles' will graduate in 1997.





HEARTLAND'S ALLIANCE FOR MINORITY PARTICIPATION

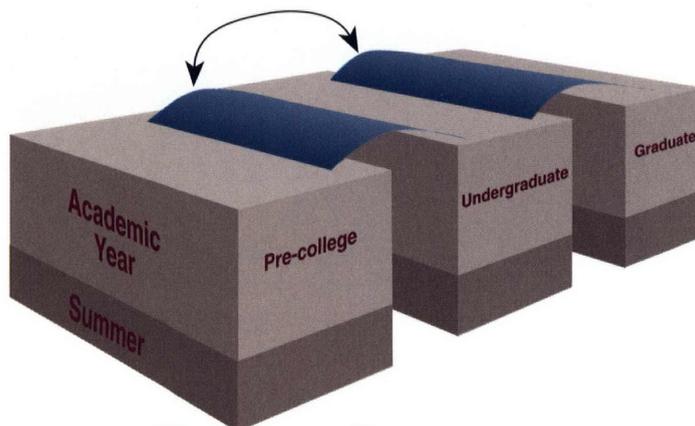
The Heartland's Alliance for Minority Participation (HAMP) seeks to improve the quality and quantity of minority students receiving degrees in science, engineering and mathematics.

The Alliance aims to increase the number of minority students receiving baccalaureate degrees in SEM by 15 percent, and it strives to increase the number of minority students entering SEM graduate programs by 50 percent.

Research indicates that a lack of role models, low teacher expectations and encouragement, and limited financial aid are among the major causes of low minority enrollment in SEM.

HAMP plays an important role in removing these barriers by using a three-tiered, early-intervention process that encourages minorities to pursue SEM careers.

HAMP's strategy focuses on "bridge" activities that address the underlying problems of minority participation at each of three critical stages in the educational process from elementary school through baccalaureate and graduate education.



BRIDGE ACTIVITIES

Tier 1: The Early Identification Program

- Emphasizes the importance of science and math in elementary and high school
- Encourages high school students to pursue science degrees
- Challenges students with potential in science fields
- Recruits SEM professionals as role models

Tier 2: The Undergraduate Transition Program

- Assists students in transition from high school and community colleges to 4-year colleges
- Features readiness seminars, tutorial assistance and support teams
- Provides summer research opportunities and related enrichment activities designed to ensure success

Tier 3: The Graduate School Transition Program

- Targets individual needs
- Dedicates mentor and financial support during the post-baccalaureate year
- Awards a fellowship after successful completion of the post-baccalaureate year
- Provides a graduate career fair for additional opportunities

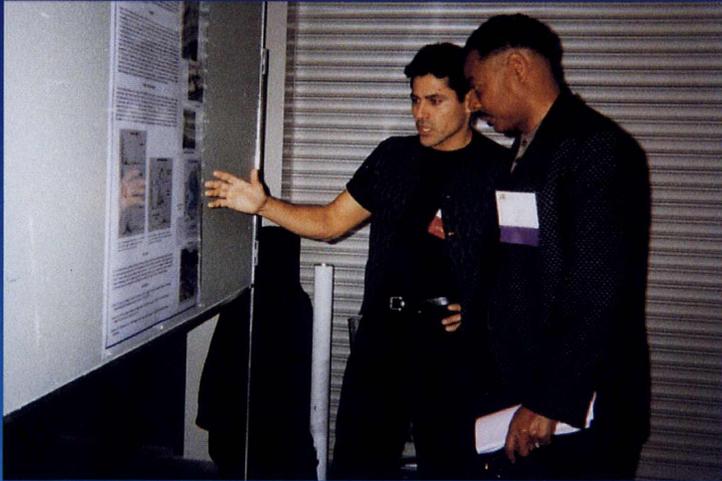
HAMP Alliance Partners

Central Missouri State University (CMSU) • Lincoln University (LU) • Metropolitan Community Colleges (KCMCC) • St. Louis Community College (SLCC) • Southeast Missouri State University (SEMO) • Southwest Missouri State University (SMSU) • University of Missouri-Columbia (MU) • University of Missouri-Kansas City (UMKC) • University of Missouri-Rolla (UMR) • University of Missouri-St. Louis (UMSL) • University of Missouri System Administration



All Nations AMP is making a positive impact with American Indian Students

Articulation, Transfer of Tribal College Students to 4-year Schools, Undergraduate Research, Bridge Programs, and Retention work are the keys to ANAMP's success.



AMP student, Daniel Oros explaining his project during the poster presentations, at the 1996 Fall AISES National Conference in Salt Lake City.

ANAMP sponsored activities at the 1997 Spring AIHEC National Conference in Rapid City, SD provided great exposure to its many opportunities for American Indian students. The activities were the Science Bowl Competition, Science Poster Competition, the Oral Presentation of students' research projects and the Internet computer lab.

All Nations AMP Program Highlights:

ANAMP sponsored ALVA program poised to go nationwide.

"Graduate School Preparation for Minorities" course set to be offered at several university partners.

Articulation & Transfer Agreements signed between Tribal Colleges and university partners.

High Plains Rural Systemic Initiative and All Nations AMP collaborate on several workshops and summer institutes for Teacher Prep Students.



AMP Student Ruth Ann Hall, Fort Berthold Community College, speaking with judge Dr. Steve Burkett, Assistant Dean, Washington State University, at the poster presentation, 1997 Spring AIHEC National Conference

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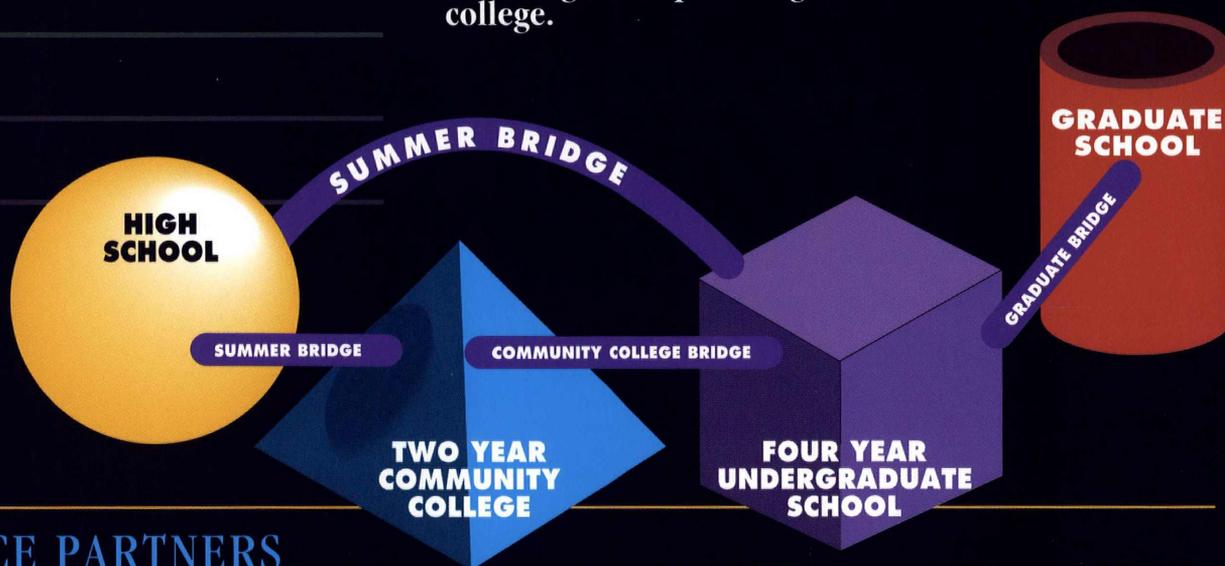
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MAMP

MID-SOUTH ALLIANCE FOR MINORITY PARTICIPATION

DEVELOPING FUTURE LEADERS IN SCIENCE, MATHEMATICS, ENGINEERING & TECHNOLOGY

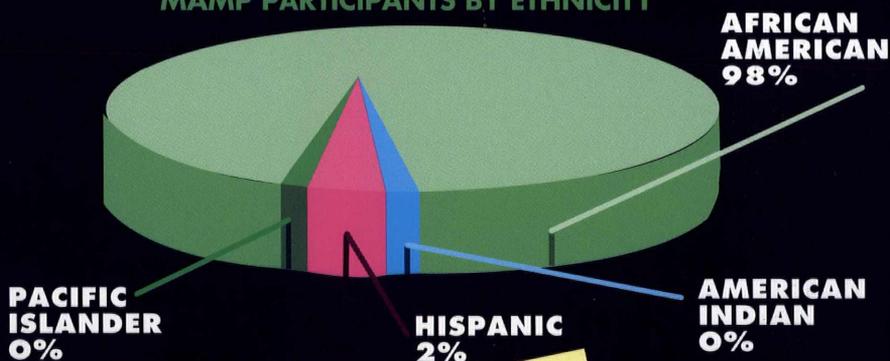
The Mid-South Alliance for Minority Participation (MAMP) began in 1995 as a partnership among eight institutions of higher education and three community based agencies in the mid-south area of Tennessee, Arkansas and Mississippi. Today the Alliance has increased its membership to 11 institutions of higher education. Our Alliance includes four historically black colleges and universities, three community colleges, three comprehensive universities and one graduate professional university. We are committed to increasing the numbers of highly qualified minority students who receive baccalaureate degrees in science, mathematics, engineering and technology. MAMP students are strongly encouraged to pursue graduate education after college.



ALLIANCE PARTNERS

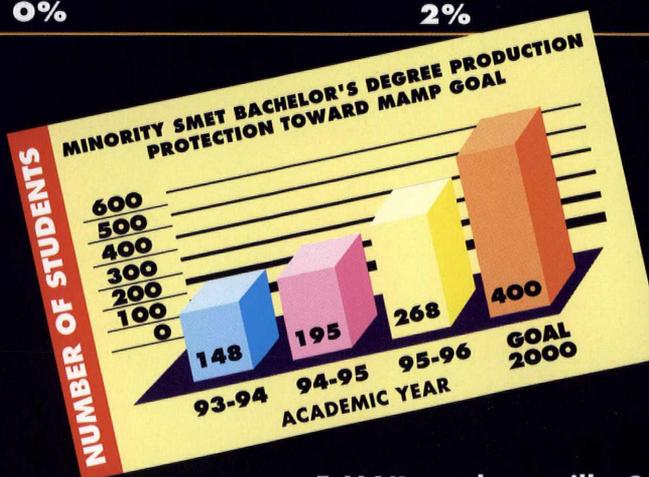
LeMOYNE-OWEN COLLEGE, LEAD INSTITUTION
 ARKANSAS STATE UNIVERSITY
 CHRISTIAN BROTHERS UNIVERSITY
 MID-SOUTH COMMUNITY COLLEGE
 RUST COLLEGE
 SHELBY STATE COMMUNITY COLLEGE
 STATE TECHNICAL INSTITUTE
 TENNESSEE STATE UNIVERSITY
 UNIVERSITY OF ARKANSAS AT PINE BLUFF
 UNIVERSITY OF MEMPHIS
 UNIVERSITY OF TENNESSEE, MEMPHIS
 MEMPHIS PARTNERS, INC.
 GLOBAL CONCEPTS, INC.
 GRANT INFORMATION CENTER, INC.

MAMP PARTICIPANTS BY ETHNICITY



ALLIANCE PROGRAMS

MAMP SCHOLARS
 SUMMER BRIDGE
 COMMUNITY COLLEGE BRIDGE
 GRADUATE BRIDGE
 UNDERGRADUATE RESEARCH
 PAID INTERNSHIP IN INDUSTRY
 FINANCIAL SUPPORT FOR STUDENTS
 MAMP MENTORING
 CAREER DEVELOPMENT
 CURRICULUM IMPROVEMENT
 COMMUNITY OUTREACH



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MISSISSIPPI

ALLIANCE FOR MINORITY PARTICIPATION

MAMP is a statewide Alliance for Mississippi's eight publicly supported universities. They are: Alcorn State University, Delta State University, Jackson State University, Mississippi State University, Mississippi University for Women, Mississippi Valley State University, University of Mississippi, and University of Southern Mississippi.

- **Scholarships:** MAMP scholars at each institution are partially supported by performance-based scholarships and form the core of student participants on each campus.

- **Summer Bridge Program:** A 4-6 week residential program on each campus incorporates both academic and life skills activities to "bridge the gap" between high school and the freshman year of college.

- **Undergraduate Research Experiences:** IMAGE Scholars are encouraged to link with a faculty member in his/her discipline to develop research skills during the academic year. These research experiences are facilitated by linking with other sponsored programs on each campus such as EPSCoR. Student research presentations at the Mississippi Academy of Sciences give students valuable experience and opportunities for interaction with SMET professionals in their discipline.

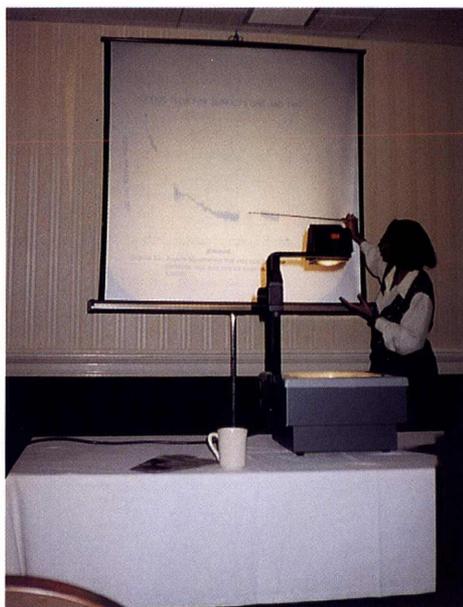


- **Drop-in Centers:** Activities include individual tutoring, computer-assisted instruction, study groups, and meetings with faculty and peer mentors.

- **Workshops:** Workshops, including GRE Prep, "Guaranteed 4.0," and NTE are conducted to assist students with reaching their goals of high

achievement. Mentoring workshops help students focus early on plans for graduate study.

- **Curriculum Reform:** MAMP's goal is to disseminate information across universities and across campuses about what is going on in SEM curriculum reform, and to stimulate plans for future action. The most successful curriculum reform activities to date have focused on the use of technology, cooperative learning, and peer mentoring to enhance student achievement.



- **Business/Industry/Government Linkage:** MAMP develops and disseminates internship opportunities in academia (including REUs), industry, and national laboratories and assists students with application and placement. Linkage with the Naval Research Laboratory at Stennis Space Center provides competitive opportunities for summer research internships for MAMP students after completion of the freshman year.

- **Bridge to Graduate School:** Assists increasing numbers of MAMP students who are enrolling in graduate school by helping to identify graduate study opportunities and assisting with the application process.



New Mexico AMP

has helped provide a comprehensive vision for the State of New Mexico and its citizens. Collaborations and cooperation with statewide agencies assist in achieving the common goals of NSF, New Mexico AMP, and the State of New Mexico. This makes it possible for a student to become part of a coherent network of organizations as early as grade school through contact with educators trained through the New Mexico AMP teacher preparation component. During middle and high school, students can receive guidance from our partners at New Mexico Mathematics, Engineering, Science Achievement, (NM MESA) Inc. New Mexico AMP's bridge programs help bring these students into the community colleges followed by transfer to a four-year institution.

At the college level, New Mexico AMP partners sponsor annual summer bridge programs designed to give students a good foundation in selected courses, help them develop essential study skills, establish group support through collaboration, provide information about career options and opportunities, and orient the student to campus life at each participating institution. Internships, scholarships, and mentoring provide motivation and inspiration for students to complete their B.S. degree and go on to graduate school. Support from the state's laboratories and industry then open the doors to employment opportunities.



As a partnership of 27 post-secondary New Mexico institutions, including 21, 2-year colleges and 6, 4-year universities, almost every New Mexico AMP partner has established an AMP organization or student support group on their campus. These groups promote community building and incorporate mentoring, tutoring, and study skills workshops along with career exploration workshops, team-building exercises, and time and stress management seminars. Computer and Internet orientation, campus tours and orientation, guest speakers, trips to SMET-related facilities, and service projects may also be included as Alliance partners tailor their programs to meet the needs of their respective students.



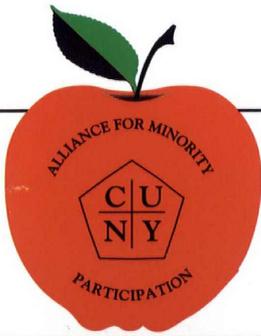
NEW MEXICO AMP PARTICIPATING INSTITUTIONS:

Albuquerque Technical Vocational Institute • Clovis Community College • Eastern New Mexico University • ENMU-Roswell • ENMU-Ruidoso • Luna Technical Vocational Institute • Mesa Technical College • Navajo Community College • New Mexico Highlands University • New Mexico Institute of Mining and Technology • New Mexico Junior College • New Mexico Military Institute • New Mexico State University (NMSU) • NMSU-Alamogordo • NMSU-Carlsbad • NMSU-Doña Ana • NMSU-Grants • Northern New Mexico Community College • San Juan College • Santa Fe Community College • Southwestern Indian Polytechnic Institute • University of New Mexico (UNM) • UNM-Gallup • UNM-Los Alamos • UNM-Taos • UNM-Valencia • Western New Mexico University • New Mexico Mathematics, Engineering, Science Achievement, Inc. (NMMESA) • NSF Systemic Initiative in Math and Science Education (SIMSE) • UCAN (Utah, Colorado, Arizona and New Mexico) Consortium

NATIONAL LABORATORIES:

Los Alamos National Laboratory, Sandia National Laboratories

New Mexico Alliance for
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NEW YORK CITY ALLIANCE

ALLIANCE FOR MINORITY PARTICIPATION IN SCIENCE, ENGINEERING AND MATHEMATICS

New York City Alliance Partners

NYC AMP consists of six City University of New York (CUNY) two-year colleges (Borough of Manhattan, Bronx, Hostos, Kingsborough, LaGuardia, and Queensborough) and ten CUNY four-year colleges (Baruch, Brooklyn, City College, College of Staten Island, Hunter, Lehman, Medgar Evers, New York City Technical, Queens, and York); as well as Brooklyn Polytechnic University, NASA's Goddard Institute for Space Studies, Brookhaven National Laboratories, and The U.S. Food and Drug Administration.

New York City Alliance Highlights

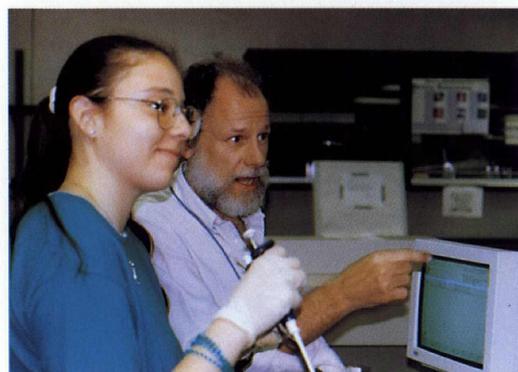
- NYC AMP committees that foster CUNY-wide consistency include: Governing Board (chancellor and five college presidents), Steering Committee (16 academic deans or provosts), Activity Coordinators Committee, SEM Course Restructuring Committees, and individual campus AMP Committees.
- NYC AMP Governing Board's AMP Institutionalization Policy Commitment Statement and Individual Campus AMP Institutionalization Statements
- NYC Alliance-wide research program (100 research scholars and 52 faculty mentors during the 1996-1997 academic year)
- NYC AMP two- and four-year college SEM research articulation program
- Seventeen NYC AMP Learning Centers
- Data gathered for NYC AMP's fourth year show a 49% increase in enrollment, 34% increase in baccalaureate degree production, and a 60% increase in associate degree production in SEM programs for underrepresented minorities over the baseline data.
- NYC AMP and NASA Goddard partnership which includes NASA funding for one teacher preparation, one internet network, and two climate research projects
- A teacher preparation initiative which includes the following partners: NYC AMP, NYC Board of Education, NYC USI, NYC CETP, NASA Goddard, New York State College Preparatory Initiative (CPI), and CUNY's Pipeline Program for Careers in College Teaching and Research

North Carolina Alliance for Minority Participation (NCAMP)

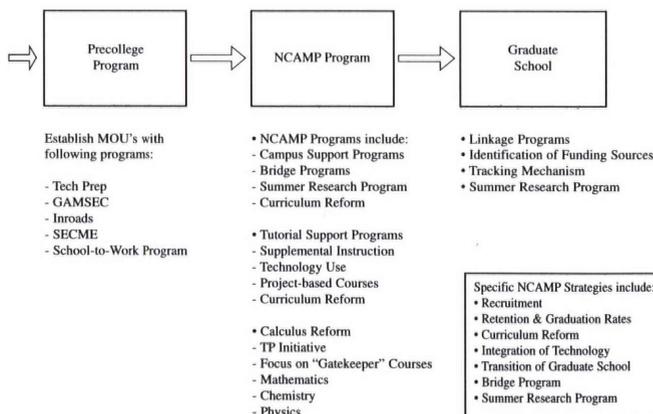
The participating institutions in the North Carolina Alliance for Minority Participation believe very strongly in its slogan, "building a stronger partnership for success." The combined efforts of all partners has resulted in programs geared to enhance student success through bridge programs, supplemental instruction, undergraduate research, and summer internships, just to name a few. These programs support approximately 4,600 minority students who are currently enrolled in partner institutions in the areas of science, mathematics, engineering, and technology fields. More importantly, approximately 750 students earned degrees in SMET fields during the past academic year. Due in part to their exposure to undergraduate research experiences, many of these graduates have been motivated to go on to graduate school to pursue the M.S. and Ph.D. degrees.

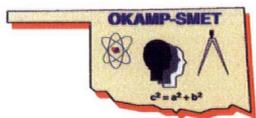


*"Building a stronger
partnership for success"*



*Fayetteville State University
North Carolina A&T State University
North Carolina Central University
North Carolina State University
University of North Carolina-Chapel Hill
University of North Carolina-Charlotte
University of North Carolina-Greensboro
University of North Carolina-Pembroke*

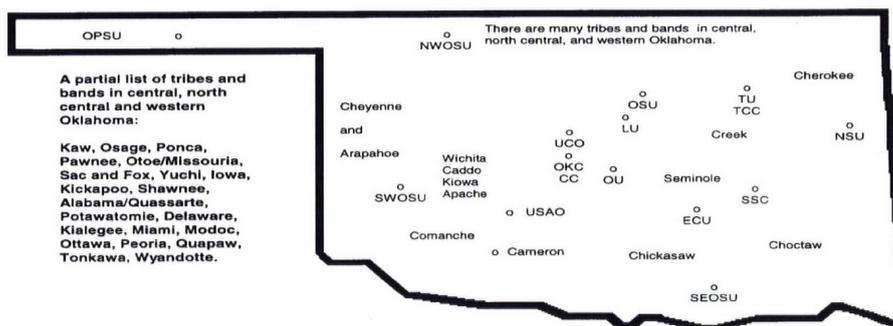




Oklahoma AMP

Science, Mathematics, Engineering, Technology, and Education

• **Partners:** Oklahoma University, Northeastern State University, Langston University, East Central University, Southeastern Oklahoma State University, University of Central Oklahoma, and Northwestern Oklahoma State University ♦ **Lead:** Oklahoma State University ○ **Affiliates:** Bacone College, Cameron University, Connors State College, Murray State College, Northeastern Oklahoma A&M College, Northern Oklahoma College, Oklahoma Baptist University, Oklahoma Christian University of Science and Arts, Oklahoma City Community College, OSU - Okmulgee, Rogers State College, Rose State College, Seminole State College, Southwestern Oklahoma State University, Southern Nazarene University, Oklahoma Panhandle State University, Tulsa Community College, University of Science and Arts of Oklahoma, University of Tulsa



The inter-institutional collaboration between Partner universities, the lead institution, and active Affiliate schools comprising OKAMP-SMETE is extraordinary and unprecedented in the state of Oklahoma. Key characteristics of three essential programs are as follows:

- **Summer Bridge Programs** - recruitment, transition, introduction to college-life as a SMETE student, personal development, academic advancement
- **Semester Scholars Programs** - retention, academic advancement, orientation to SMETE culture, peer-mentoring
- **Research Internship Programs** - research, academic advancement, submersion into SMETE culture, advanced mentoring, transition



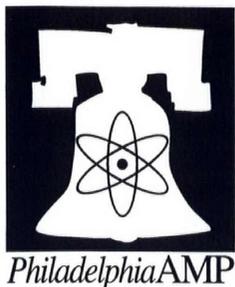
1996 Bridge Program Scholars

OKAMP is developing a model for support programs where 4-6 participants are placed in units called **CADRES**. The Cadre is based on the academic major and the unit meets weekly. It is expected that within the Cadre SMETE students will begin to appreciate their unique role in a community of scholars with common academic interests. Further, the multidisciplinary nature of the SMETE community is emphasized

when all Cadres of Scholars, representing many disciplines, converge for monthly program meetings. Eventually, Cadre-based programs could emerge as an innovation from which more effective multidisciplinary

support programs serving diverse populations of SMETE students might be developed. Statewide Office: OKAMP-SMETE

Oklahoma State University • 246F Noble Research Center • Stillwater, Oklahoma • 74078-3035
 ph(405)744-7820 • FAX(405)744-7799
<http://bmb-fs1.biochem.okstate.edu/OKAMP/>



Greater Philadelphia Region Alliance for Minority Participation

*Cheyney University • Community College of Philadelphia
Delaware State University • Drexel University • Lincoln University
Philadelphia Education Fund • Temple University • University of Delaware
University of Pennsylvania*

The Greater Philadelphia Alliance for Minority Participation, now in its third year of operation, represents an extremely diverse partnership of public and private, two- and four-year, research and non-research, Historically Black Colleges and Universities (HBCUs) and majority institutions. Throughout the Alliance, students are able to participate in a wide variety of programs, such as summer pre-freshman bridge and academic year support, career awareness and preparation for graduate school, internships with industry sponsors, learning communities, undergraduate research projects and symposia, programs to facilitate the transition from community college to four-year institutions and teacher preparation.

In Year 1 the Alliance: (1) assessed the strengths and needs of each partner institution and the potential for cooperation among them, and (2) implemented programs which improve the recruitment and retention of minority SEM students, with particular emphasis on the freshman level, at all Alliance institutions. During Year 2, activities were designed: (1) to maximize the sharing of expertise and resources across the Alliance, (2) to foster the inter-institutional flow of students, as in the case of student research, and (3) to assess the ability of the Alliance to achieve its goal through the examination of its partnerships, infrastructure, internal evaluation mechanisms and program effectiveness.

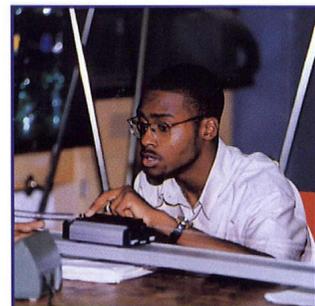
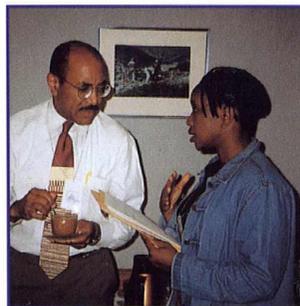
Three distinct types of inter-institutional cooperation have contributed substantial added value to the project. In the first type, programs developed by one institution were replicated at others. Examples include: (1) Site support teams to coordinate all institutional AMP activities, first developed at the University of Delaware and Lincoln University, were adopted by Cheyney, Delaware State, Drexel, and Temple Universities. (2) Peer tutoring, already in place at several institutions, was adopted by Cheyney and Temple Universities. (3) Drop-in centers, already in place at the University of Delaware, Drexel University, Lincoln University, and the University of Pennsylvania, were established at Community College of Philadelphia (CCP), Delaware State, and Temple Universities.

In the second type, programs were developed jointly by two or more institutions. Examples include: (1) Two new engineering program-by-program articulation agreements were implemented between CCP and Temple and one is being finalized for chemistry. (2) Two new concurrent enrollment programs were implemented, one between Temple University and CCP and one between Drexel University and the George Washington Carver High School of Engineering and Science, which allow students to get acquainted gradually with the institution to which they intend to transfer. (3) The

support systems of CCP and Temple University have been closely integrated to make the transition as nearly seamless as possible. (4) Courses have been developed jointly by CCP and Temple University faculty (biology) or team taught by CCP and University of Pennsylvania faculty (mathematics). (5) The teacher preparation summer institute was developed by faculty from five institutions (CCP and Cheyney, Delaware State, Lincoln, and Temple Universities).

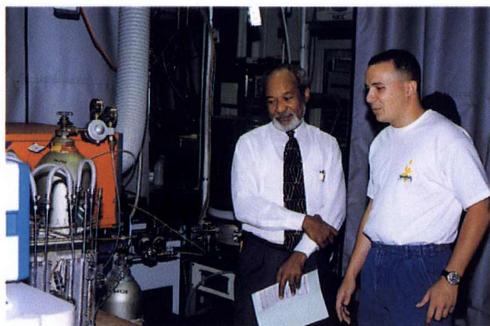
In the third type, one institution makes its resources available to the others. Examples include: (1) Students participated in summer research at Alliance institutions other than their own: Eleven students (from CCP, Drexel, and Lincoln Universities) worked at Temple University and two students (from Lincoln and Temple Universities) worked at the University of Pennsylvania. (2) Students in the CCP-Temple concurrent enrollment program have access to all Temple University student facilities.

In Year 3, more emphasis will be placed on the retention of students at all levels. This will be accomplished through the development and implementation of institutional strategies to directly service every minority SEM student.



Puerto Rico Alliance for Minority Participation

The Puerto Rico Alliance for Minority Participation (PR-AMP) was established in 1991 with a grant from the National Science Foundation to increase the number of students that obtain a baccalaureate degree in science, mathematics, engineering, and technology (SMET), from 1,709 in 1991 to 2,646 in 1996, and to 4,071 by the year 2001. PR-AMP is an alliance of the major higher education institutions in the Island, with a 1995 SMET undergraduate enrollment of 19,139, 80% of Puerto Rico's undergraduate population in these fields, creating a truly systemic statewide reform effort. To achieve its goal, PR-AMP is increasing the effectiveness and efficiency of the undergraduate educational enterprise by transforming the teaching/learning culture.



PR-AMP aims to transform SMET undergraduate education by: (1) incorporating into the SMET curriculum inquiry-based and discovery activities that promote the development of thinking skills, emphasizing key concepts to stress depth of understanding and developing broad based mathematics skills; (2) providing students with intensive and varied research experiences to enhance their motivation and learning and prepare them more effectively for SMET careers and graduate studies; and (3) strengthening the infrastructure and widespread use of the technology for faculty and students' development.

PR-AMP ACTIVITIES

CURRICULUM REVISION - SMET courses will continue to be revised to promote depth of understanding and to incorporate research activities and experimental design. Teaching strategies, such as Cooperative Learning and the use of demonstrations will be used to promote active learning.

UNDERGRADUATE RESEARCH - Students are provided with research opportunities during the summer and the academic year. Research experiences are available at local universities, national laboratories and local industries.



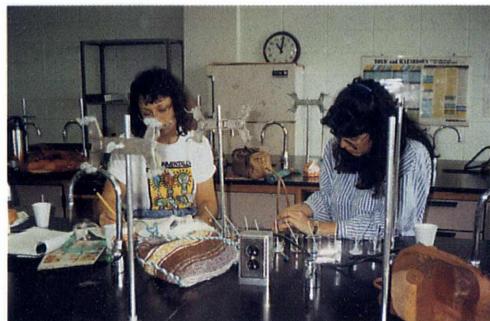
PRISM - The Puerto Rico Interdisciplinary Scientific Meeting (PRISM), co-sponsored with the American Chemical Society Puerto Rico Students Chapter, provides students with an annual forum to present their research projects. In 1997, 334 students presented their projects and over 800 students participated in this interdisciplinary islandwide activity.

TADDEI - The Spanish acronym for Study/Learning Skills Within the Content of a Course, originally initiated in Chemistry, is now being expanded to other SMET disciplines. Faculty and advanced student peer mentors help students develop study/learning skills within the content of a course.

SEMINARS ON APPLICATION OF COGNITIVE SCIENCE TO THE TEACHING OF SMET COURSES - A series of seminars are offered to undergraduate faculty to familiarize them with the latest developments in this field, and to encourage the incorporation and transfer of these developments into their courses.

STIPENDS FOR LOW-INCOME STUDENTS - Awards ranging from \$500 to \$2,000 per year are awarded on a competitive basis to those students who present the highest financial need and who maintain a high academic performance profile. Students that are both low-income and first generation college students are given priority in this activity.

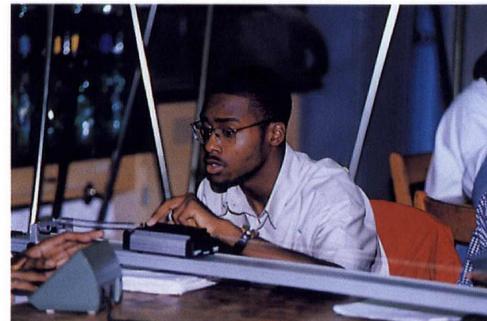
Faculty, Industry, and Peer Mentoring - Industry, faculty and peer mentors are selected to provide professional and personal orientation according to students' career interests in SMET fields. Each mentor-protégé develops activities that will contribute to enhance the students' preparation and their future study and career plans.



SMET TEACHING CAREERS - SMET students are enticed to consider and follow Science and Mathematics Teaching Careers by exposing them to precollege teaching experiences through the Puerto Rico Statewide Systemic Initiative (PR-SSI), the Island's science and mathematics education reform. Students already in teacher preparation programs are provided with enhancement activities such as research experiences and a teaching practicum in the PR-SSI schools where they are exposed to empowered science and mathematics teachers that serve as role models. All science and mathematics education majors participating in this program also benefit from the other PR-AMP activities.

BRIDGING ACTIVITIES - Provided to attract and prepare high school students for engineering studies, it offers a one week residential summer camp experience at the participating Schools of Engineering.

There is a special need for this type of activity since high schools do not expose students to the field of engineering. Also a Graduate Studies Orientation and Mentoring Program is offered to assist and encourage undergraduate students to pursue graduate studies in SMET fields.



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The South Carolina Alliance for Minority Participation (SCAMP) Program is a Partnership of 8 institutions of higher learning dedicated to fostering achievement for minority students to SMET fields. To accomplish this, partner institutions conduct a variety of programs and activities including:

- **Summer Bridge Programs** for incoming freshmen which emphasize mathematics using technology and collaborative learning techniques. Many programs also offer workshops in computer applications and communication skills.

- **Directed Research** during the summer and academic year. Students conduct cutting edge research under the supervision of a faculty advisor in their degree field. Collaboration among Alliance partners permits students to conduct research with faculty members at any institution. Students also participate in external research opportunities offered by academic, governmental, and private-sector laboratories.

- **Student and Faculty Mentoring Programs** provide support for students in their selected course of study.

- **Faculty Workshops** are held throughout the year to discuss and evaluate curriculum reform in "gatekeeper" courses throughout the Alliance.

In just four years SCAMP has already experienced a 62% increase in bachelor degrees granted to minority students in SMET fields. The program also experienced a 32% increase in enrollment which will further the success of the program. This success is a major reason the State of South Carolina appropriated supplemental funding for SCAMP in the amount of \$1.8 million (over the past three years) enabling the Alliance to impact more students by expanding activities and programs.

SCAMP is an integral part of educational reform in South Carolina, and has formed partnerships with the SC State Systemic Initiative (SSI) and SC Experimental Program to Stimulate Competitive Research (EPSCoR). For example, SC EPSCoR provides research opportunities for SCAMP participants and SCAMP students are working with the SC SSI's HUB Network as role models to inspire precollege students.



1996 Summer Interns with Dr. Judith Salley, SC State University, and Dr. Rodell Lawrence, Owens-Corning.

Introducing **SUNY and SUNY AMP**

The State University of New York (SUNY) is a very large unified system of public higher education with 64 campuses and about 400,000 students. SUNY comprises a unique system of community colleges, two-year colleges of technology, specialized and statutory colleges, traditional four-year colleges, research university campuses, and academic health science centers.

SUNY AMP will have a direct impact on minority student participation in SMET at each member institution of the 16-campus AMP coalition.

Highlights

In its first year of operation, SUNY AMP has already begun to impact minority student participation in SMET.

Curricular and pedagogical innovation

SUNY AMP is a partner of the NSF-supported Long Island Consortium for Interconnected Learning (LICIL) in Quantitative Disciplines. In conjunction with LICIL, SUNY AMP will impact how faculty teach and how students learn in dozens of courses, including gatekeeper courses, more advanced discipline-specific courses, and multidisciplinary courses.

Student Research Opportunities

Through SUNY AMP and the New York State-supported Collegiate Science and Technology and Entry Program (CSTEP), 350 students attended a research conference in spring, 1997.

Graduate school preparation and awareness

Buffalo AMP, in conjunction with the New York State-supported CSTEP program, hosted a major conference on graduate school opportunities in spring 1997.

Articulation agreements (between community colleges, four-year colleges, and university centers)

Strong articulation agreements existed prior to the formation of SUNY AMP. SUNY AMP is maximizing the number of students who are taking advantage of these agreements.

Program assessment

SUNY AMP is working with the NSF-supported Long Island Consortium for Interconnected Learning in Quantitative Disciplines to develop tools to assess how faculty teach and students learn across many disciplines. In addition, the evaluators will look at the impact of learning/teaching changes on the retention and graduation of minority students in SMET.

Funds

- Stony Brook AMP, a part of SUNY AMP, was a major contributor to a successful NSF proposal that led to Stony Brook's receiving a \$500,000 three-year Recognition Award for the Integration of

Research and Education (RAIRE). (Stony Brook was one of ten research-intensive universities to receive the NSF first-ever RAIRE).

- Stony Brook's AMP received an \$800,000 grant from Computer Associates to increase the number of minority students who receive bachelor's degrees in computer science at Stony Brook.

Alliance Institutions

Headquarters:

SUNY at Stony Brook, Stony Brook, NY

Binghamton Region:

State University at Binghamton

Broome Community College

Tompkins Community College

Buffalo Region:

State University at Buffalo

Buffalo State College

Hudson Valley Region:

State College at New Paltz

State University at Albany

Ulster County Community College

Dutchess County Community College

Orange County Community College

Schenectady County Community College

Long Island Region:

SUNY at Farmingdale

Nassau Community College

State College at Old Westbury

State University at Stony Brook

Suffolk County Community College



SUNY Stony Brook science students: Marvin Vasquez and Emilia Maynard

Texas A&M University (TAMU) System Alliance for Minority Participation (AMP) Effectiveness Summary - 3/97

The Texas A&M University (TAMU) System Alliance for Minority Participation (Texas AMP) is comprised of 14 partner institutions (five TAMU System Universities and nine community colleges), which have collaborated to provide mechanisms for the maintenance and further increase of minorities in science, engineering, and mathematics disciplines since the 1991-92 academic year. In that time the TAMU System AMP program has served over 2,200 students through programs and activities aimed at removing barriers to academic success and increasing retention of potential "at risk" students.

Among the five, four-year partner institutions (TAMU - College Station, TAMU - Kingsville, Prairie View A&M, TAMU - International, and TAMU - Corpus Christi), the provision of one-to-one support by faculty, staff, and peers has been a primary component of Texas AMP's activities (targeted in over 95% of activities). In addition, learning about SMET careers (81%), the observation of and interaction with non-academic SMET professionals (60%), and cooperative group study (targeted in 33% of activities) have been integral parts of intervention. Mentoring and Bridge Programs have been in practice since the inception of Texas AMP. The effectiveness of AMP activities is reflected by grade point averages (GPA) and retention. Increases in GPA after the freshman year, from an average below 2.5 to one above 2.5 have been consistent, and the average GPA's of stipended AMP students have generally remained greater than those of non-stipended AMP students, averaging over 2.8 (observed across all four year institutions and all classes). Across all four-year institutions, AMP SMET retention over a one-year period has averaged 77.79% and over a four-year period has averaged 60.11%, while non-AMP SMET retention has averaged 58.96% for a one-year period and 39.46% for a four-year period. This retention calculation includes students who transferred to other institutions and are still continuing their education.

Texas A&M University - College Station (the largest four-year Texas AMP institution) is one of three Alliance institutions where students have participated in residential Transfer Bridge Programs. Also, in chemistry, physics and calculus, sophomore and junior minority students in the College of Engineering have an average cumulative GPA higher than the average for these classes, a goal of Academic Workshops held at College Station. Migration inclusive retention at College Station for AMP SMET students has averaged 84.29% and 69.81% over a one- and four-year period, respectively, while that for non-AMP SMET students averaged 67.50% and 43.19%.

Texas A&M University-Kingsville has provided a wide array of activities targeting not only retention, but also the recruitment of SMET students. Increasing the number of SMET students has been a primary goal of Kingsville's activities (i.e., the Leadership Ladder and Bridge Programs). Education about SMET careers has been addressed through seminars (e.g. AT&T Bell Seminar) and through interaction with non-academic professionals (e.g. Industry Mentors). Migration inclusive retention at Kingsville for AMP SMET students has averaged 66.78% and 48.81% over a one- and four-year period, respectively, while non-AMP SMET students averaged 43.50% and 27.20%.

In addition to mentoring, Prairie View A&M University has held Academic Workshops, aimed at increasing retention. The "Engineering and Science Concepts" (ESCI) program has been aimed at attracting high school graduates to SMET careers. Ninety percent of students participating in the ESCI program have subsequently enrolled at Prairie View and 85% of these students have remained in the fields of Engineering and Computer Science. Prairie View migration inclusive retention was 88.42% and 86.00% over a one- and four-year period, respectively, for AMP SMET students and 63.52% and 46.91% for non-AMP SMET students over the same periods.

Texas A&M University-International (Laredo) and TAMU-Corpus Christi were transformed from two-year Senior Colleges to 4-year institutions within the past two years. As both a two-year and a four-year institution TAMU-International has utilized Mentoring as one of its primary activities. GPA's of Laredo AMP students have been greater than 2.9 and retention for AMP students has been higher than for the non-AMP SMET student. At TAMU-Corpus Christi and AMP Teacher Preparation program has been piloted over the past academic year. The AMP Teacher Preparation Program has focused upon (1) undergraduate research and teaching practices; (2) revision of college SMET curriculum and teaching methods to improve student learning and professors' modeling of teaching; and (3) creating systemic institutional linkage with the School of Education.



UT SYSTEM AMP A CATALYST OF CHANGE

*The University of Texas System Alliance for Minority Participation
nine academic components of the University of Texas System and six regional
community college districts in an effort to increase the number of undergraduate and
graduate degrees in science, mathematics, and engineering technology (SMET)
through curriculum revision, student stipend, mentoring, and research participation.*

The UT System Alliance represents a commitment at the highest level of leadership to increase the participation of all students in SMET majors. The University of Texas at El Paso, the lead institution in this Alliance, and the other UT system universities and community college district partners are continually developing and implementing strategies to reshape teaching to achieve more effective student learning. This commitment to systemic change is promoted by the UT System Alliance through adoption of teaching and curriculum reform, the success of summer bridge programs, and cooperation between universities and community colleges. These systemic institutional changes, in conjunction with quality mentoring of student researchers, are producing an increased number of research-oriented SMET graduates who are competitive in their fields and well-prepared to enter complex SMET-related professions.



At the "Creating Pathways for Student Success" symposium at UT El Paso, Dr. Shirley Malcom speaks on the importance of diversity in education and the workforce.



Dr. Diana Natalicio, the UT System AMP Project Director, waiting to speak at the "Creating Pathways for Student Success," a UT AMP System conference held July 12, 1996 on the UT El Paso campus



Sheila Tobias addresses curriculum reform at the UT System AMP symposium "Creating Pathways for Student Success."

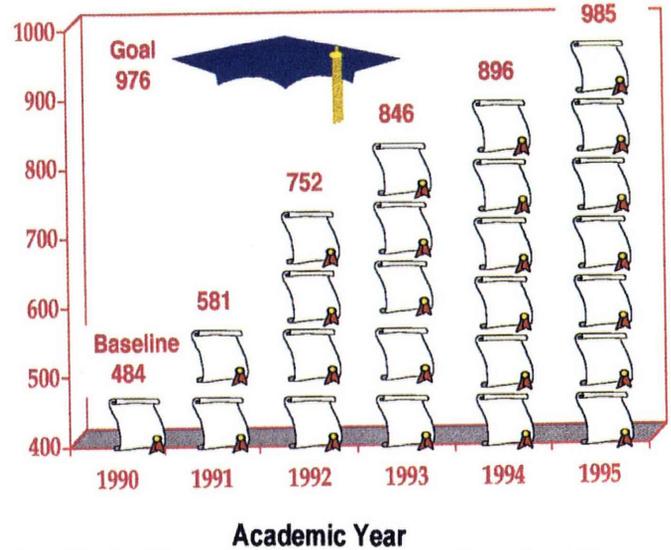


Visit our World Wide Web Site:
<http://mati.eas.asu.edu:8421/>

We Exceeded our Goal!

Our Phase I alliance, the Southern Rocky Mountain AMP, certified to the National Science Foundation that we exceeded our goal and have more than doubled the annual number of baccalaureate degrees in science, mathematics, engineering, and technology (SMET) awarded to underrepresented minorities within our region from 484 in the academic year 1990 to 985 in the academic year 1995. We continually tracked our progress toward this goal by determining the rate of SMET B.S. degrees awarded to African Americans, American Indians, and Hispanics within our region. To reach (actually exceed in our case) our original goal of doubling the annual number of baccalaureate degrees awarded to SMET underrepresented minority students, we formulated and implemented a strategy to ensure high student and faculty participation within a carefully selected mix of programs that are designed to (1) enhance student and faculty skills; (2) create a critical mass of student and faculty participants in these enrichment programs; (3) target for positive change key transitions in the academic life of students thereby increasing retention; and (4) construct a new environment that provides significant student-faculty interactions outside the classroom.

In our Phase II WAESO alliance we have added the state of Nevada. Our new goal is to again double the rate of SMET degree production from our new, higher baseline.



Southern Rocky Mountain AMP B.S. Degree Rates for African American, American Indian, and Hispanic SMET students.

Generating More Highly Qualified U.S. Scientists and Engineers With Diverse Backgrounds

The goal throughout the existence of our projects has been to tap a new source of highly qualified individuals in order to diversify the technological workforce and to help corporations meet workforce requirements in the midst of increasingly shorter supplies of traditional workers and ever tightening restrictions on the numbers of foreign workers allowed to work in the US. We have demonstrated that our graduating minority students are as academically qualified as the majority students nation-wide. Nearly 60% of our students have a cumulative grade point average above 3.0. This compares very favorably with the national average for the majority population. In 1996, our alliance graduated 464 minority engineers, 101 minority computer scientists, 88 minority mathematicians and physical scientists, and 332 biological, environmental, geo, and other scientists. Based on our proven record of success we wish to partner with institutional bodies such as corporations, universities, and government bodies in order to provide us with the flexibility and significant investments necessary in order to continue to ensure an ample supply of highly qualified scientists and engineers for the technological workforce.



Students and the Patterns In Nature Van which houses a mobile scanning probe, scanning electron, and optical video microscopes, as well as laptop computers for image collection and processing. This van will be visiting K-12 schools within the SRM-AMP bringing hands-on scientific imaging to enrich science and math courses while training teachers to use the latest advances in microscopy and computer-aided image visualization.

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