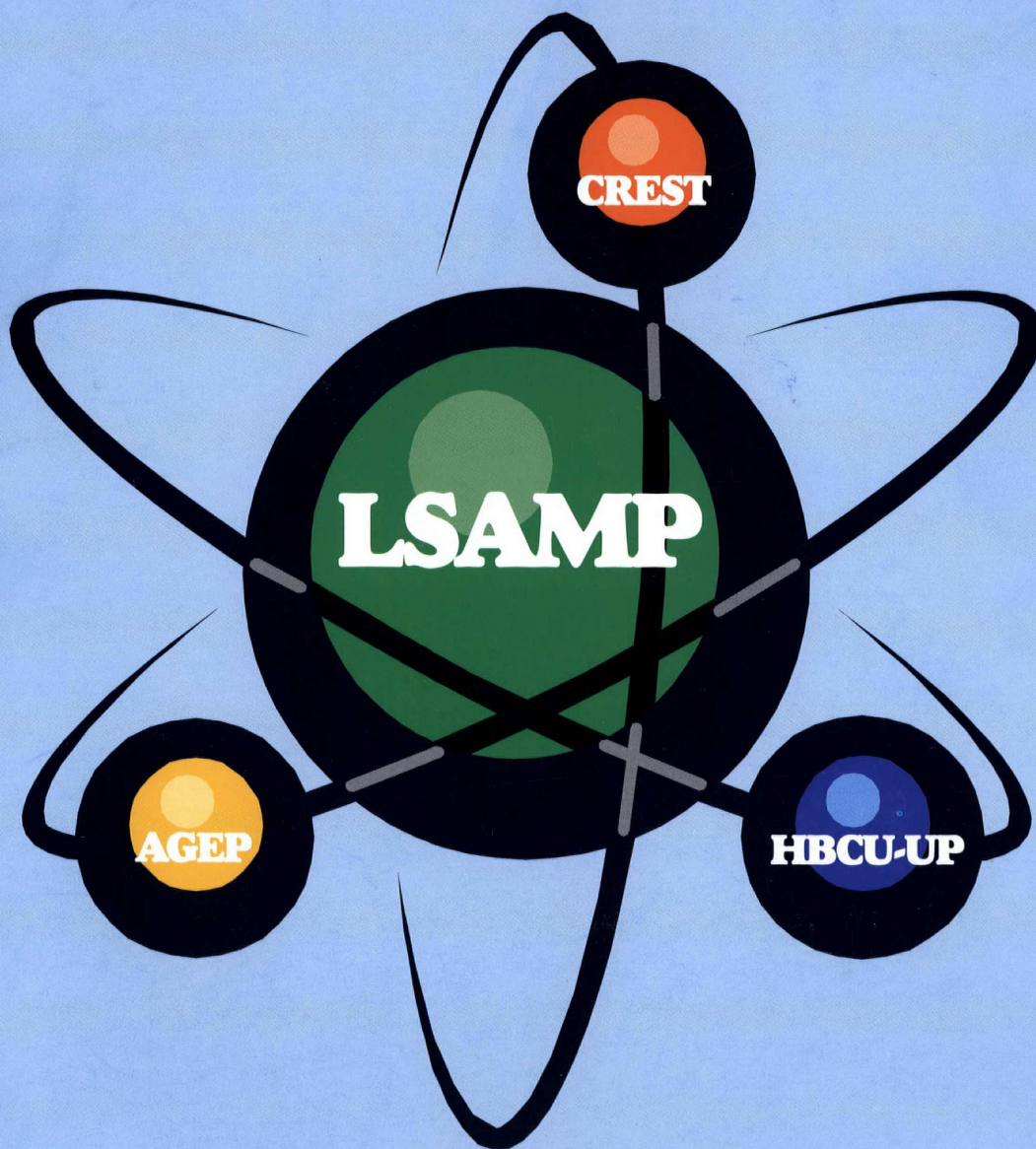


Achieving Excellence

Through

***Collaborations, Linkages,
and Partnerships***



**The National Science Foundation
Louis Stokes Alliances for Minority Participation
Magazine**

2000

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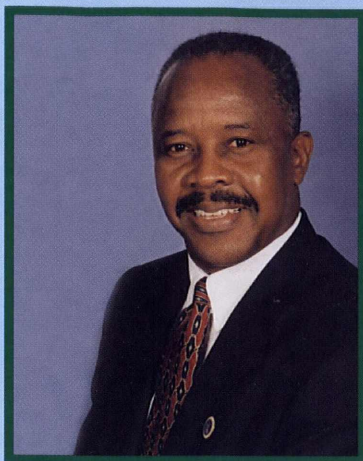
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LSAMP Continues to Set the Pace

Dr. A. James Hicks, LSAMP Senior Program Director



As you read our Year 2000 LSAMP Magazine, you will see that the Louis Stokes Alliances for Minority Participation program (LSAMP) continues the pacesetting mark, which was first achieved last year, of graduating more than 20,000 underrepresented minorities in science, mathematics, engineering and technology (SMET) disciplines. The actual baccalaureate degree totals and the number of student participants are depicted in a bar graph on the next page. While degree gains over the last year are modest, student enrollment continues to climb and retention is much improved. And while program results outlined show great progress, the hard truth is that we simply must do more.

Towards that end, LSAMP projects now track graduates and provide formal training in graduate school preparation, including the admissions process.

The Westat Report, a major study of exemplary practices in federally funded programs designed to increase the participation of minorities in SMET fields, was completed in early spring of this year. While programs from three federal agencies were included--the National Science Foundation (NSF), the National Institutes of Health (NIH), and the National Aeronautics and Space Administration (NASA)-- this report focuses primarily on NSF's LSAMP program. Excerpts from the report, "Keys to Success in the LSAMP" by Dr. Carolyn Braswell are included in this edition of the magazine.

Another LSAMP milestone is observed in the program being featured among accomplishments in the 1999 NSF Accountability Report (=NSF Annual Report).

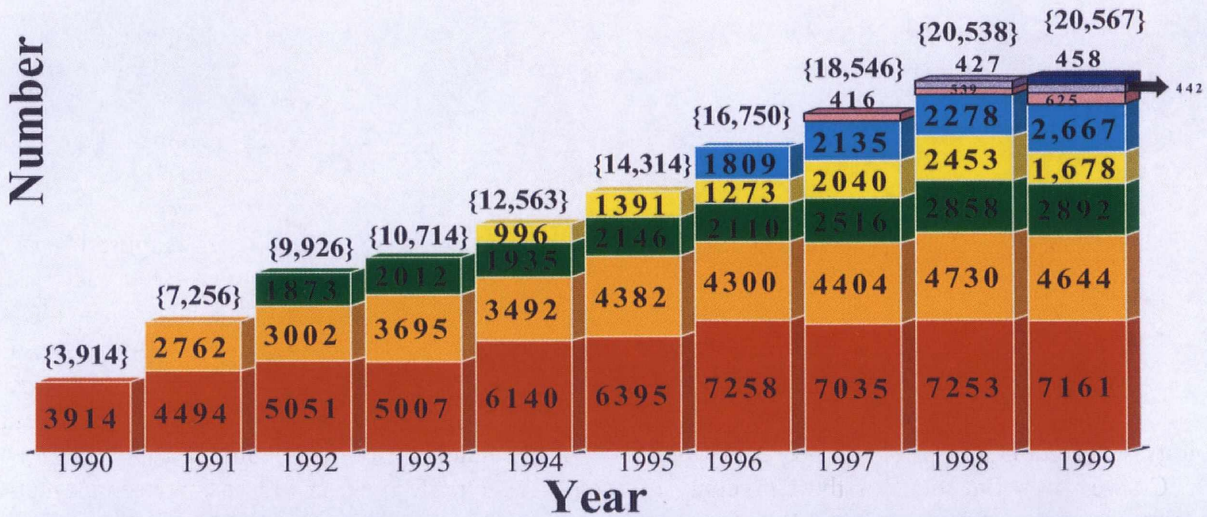
The Year 2001 will mark the 10th anniversary of the LSAMP program and we shall commemorate this significant milestone by convening a Summit on the 21st Century Work Force in the Nation's Capital. I am more confident than ever that with our committed NSF leadership (some featured in this edition), the strong alliances across America, and your dedicated support, we will continue significant progress in meeting the challenges of underrepresentation of minorities in SMET disciplines.



The Louis Stokes Alliances for Minority

Participation Program

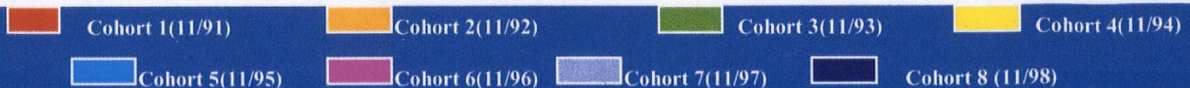
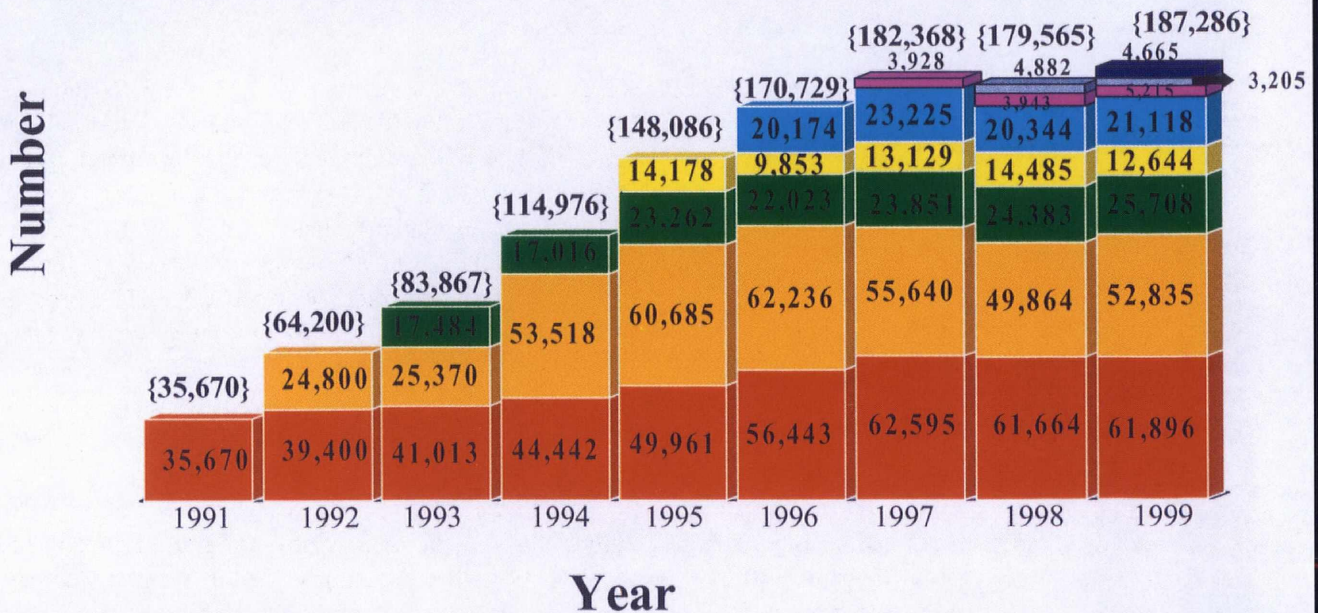
SMET Minority BS DEGREE Production



The Louis Stokes Alliances for Minority

Participation Program

SMET ENROLLMENT for Individuals from Ethnic and Minority Groups that are Underrepresented in the SMET Workforce



NSF Begins New Millenium with New People

The new millennium began with new leadership at the National Science Foundation (NSF). Dr. Rita Colwell replaced Dr. Neal Lane as Director in 1998, Dr. Judith Sunley replaced Dr. Luther Williams as Assistant Director for Education and Human Resources (Interim) in 1999, and Dr. Norman Fortenberry replaced Dr. Roosevelt Calbert as Director of the Division of Human Resource Development (Acting) in 2000. These changes are expected to bring new initiatives, new programs, and new directions to the Foundation.



Dr. Rita R. Colwell
Director

On August 4, 1998, Rita Rossi Colwell took office as Director of the National Science Foundation, an independent agency of the Federal Government that provides support for research and education in science, mathematics, engineering,

and technology. Immediately prior to becoming NSF Director, Dr. Colwell was President of the University of Maryland Biotechnology Institute and Professor of Microbiology at the University of Maryland, positions she had held since 1991 and 1972 respectively. While at the University of Maryland, Dr. Colwell also served as Director of the Sea Grant College and Vice President for Academic Affairs.

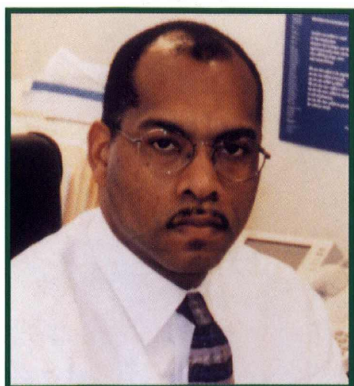
Dr. Colwell began her career as a Research Assistant at the University of Washington, where she also held the position of Predoctoral Associate and Assistant Research Professor. She served as Guest Scientist at the National Research Council of Canada after earning her Ph.D. From 1963 to 1972, she was a member of the biology faculty at Georgetown University.



Dr. Judith S. Sunley
Assistant Director for the
Directorate of Education
and Human Resources
(Interim)

On August 15, 1999, Judith S. Sunley was appointed Interim Assistant Director for the Directorate for Education and Human Resources at the National Science Foundation.

Immediately prior to becoming NSF Interim Assistant Director, Dr. Sunley served as NSF representative to the National Science and Technology Council in the White House Office of Science and Technology Policy. She also served as Assistant to the Director for Science Policy and Planning. In this capacity, Dr. Sunley played a lead role in NSF's budgeting, planning, and program implementation. Dr. Sunley coordinated final stages in the development of NSF's 1995 strategic plan, *NSF in a Changing World* and Foundation implementation of the 1993 Government Performance and Results Act. Dr. Sunley served as co-chair of an interagency working group with the Department of Education charged with developing an action strategy for using key federal resources to assist states and local school systems in improving student achievement in mathematics and science.



Dr. Norman Fortenberry
Acting Director, Division of
Human Resource Development

Since January 2000, Dr. Norman Fortenberry has served as Acting Division Director of the Division of Human Resource Development (HRD). HRD's mission is to promote efforts to increase the participation and advancement of underrepresented groups and institutions at every level of science, mathematics, engineering and technology (SMET) education and research. In addition, Dr. Fortenberry has been Division Director of the Division of Undergraduate Education (DUE) since November 1996. DUE serves as the focal point of NSF's agency-wide effort in undergraduate education. DUE's programs and leadership efforts seek to strengthen and ensure the vitality of undergraduate education in SMET for all students as they prepare for their futures as SMET professionals, K-12 teachers, technicians, civic leaders, and responsible citizens in an increasingly technological society. Dr. Fortenberry also serves as NSF's Official Liaison to Community Colleges.

Dr. Fortenberry's previous position was Executive Director of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. (The GEM Consortium) after serving as Associate Program Director, Program Director, and Staff Associate in DUE from 1992 to 1995.

Sunley Assumes Leadership of Education and Human Resources

Louis Dale



DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES



Dr. Judith Sunley assumed the position of Interim Assistant Director for Education and Human Resources on August 15, 1999, placing her at the forefront of efforts by NSF to improve student achievement in science and mathematics in the Nation's schools and to increase underrepresented minority participation in the Nation's science and engineering enterprise.

The meeting with Dr. Sunley was scheduled on April 27, 2000, at 11:00 a.m., between a number of earlier meetings and her flight to New York. I arrived at her office at precisely 11:00 a.m., just as she was returning from another meeting. We walked into her private office and she asked me to be seated at a table by the window overlooking the streets of Arlington. The office was very neat and well organized. She was relaxed and cordial as we began the interview.

Prior to assuming the position of Interim Assistant Director for Education and Human Resources, you served as Assistant to the Director for Science Policy Planning and in many other important positions at NSF. What do you see as the direction of this directorate as we begin the new millennium?

The Directorate is moving in a variety of directions. The National Science Foundation has three goals. They are related to 1. Ideas – New discoveries and their connections to use; 2. Tools – Real and virtual platforms to support research and education; and 3. People – Developing a diverse, internationally competitive workforce, including citizens well prepared in mathematics and science. The Directorate will help NSF meet these goals using strategies that include integration of research and education, developing intellectual capital, and promoting partnerships. It is important to note that NSF is only one of many contributors to education and human resources development in the U.S. For example, NSF spends about \$300 million annually on K-12 mathematics and science education while the nation spends more than \$300 bil-

lion on K-12 education. Thus to be effective in improving K-12 mathematics and science education and in developing the diversity of human resources, NSF must form partnerships to leverage resources of all types – human, physical, and financial.

“to be effective in improving K-12 mathematics and science education and in developing the diversity of human resources, NSF must form partnerships to leverage resources of all types – human, physical, and financial”

tion. We know many teachers enter the profession without strong preparation in mathematics and science, yet end up teaching those subjects.

Moreover, new teachers just out of college are frequently placed in classrooms without adequate orientation.

When teachers struggle with subject matter or methods of teaching, their students suffer, and we risk a continuous cycle of negative reinforcement. The question then becomes, where do we intervene in this cycle? Systemic reform takes time to fully take effect in a school district. We must be sure that the entire school district is involved in the reform effort. At the same time, we need complementary efforts to help break the cycle.

The Nation has made progress in K-12 student achievement in mathematics and science but still has a way to go to assume world leadership. Do you see the United States assuming leadership in these areas in the near future?



Dr. Sunley working at her desk

If you define leadership as performing better than other countries on international assessments, we have a long way to go. In the lower grades, we start from a stronger position, and we have made more progress there. The 1995 international testing showed a serious drop in performance between grades 4 and 8 and very poor performance by grade 12. The NSF systemic reform projects show that it is very challenging to improve performance significantly starting in the middle grades. Students need strong grounding that enables both key skills and conceptual understanding as they move to more advanced mathematics and science. EHR is implementing systemic reform and other programs to address performance issues. Many of the projects key on professional development, in both content and pedagogy, for teachers. We also focus on teacher prepara-

The National Science Foundation and the Directorate for Education and Human Resources has been successful in increasing the number of women and underrepresented minorities receiving undergraduate SEM degrees and participating in the national science and engineering enterprise. In your view, what is the next step for the Foundation and the Directorate?

While I agree that the Foundation and the Directorate have been successful in increasing the number of women and underrepresented minorities receiving undergraduate SEM degrees, and that is worth bragging about, the number is still small in comparison with the total population. Thus, we must continue our efforts in this category. The Louis Stokes Alliances for Minority Participation (LSAMP) program has been instrumental in these efforts. The new Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) is designed to continue this effort and to better prepare mathematics and science students to be successful in graduate school. Concurrently, the Alliances for Graduate Education and the Professoriate (AGEP), formerly the Minority Graduate Education (MGE) program, has been reformulated to better address issues related to graduate education. The program will enhance the success of minority graduate students by

providing role models and mentors in the context of high quality research and education.

tant as it is with agencies and organizations outside of the Foundation.

The foundation supports science, engineering, and mathematics programs from kindergarten through graduate school. Are you satisfied that enough linkages exist between these programs?

We are working on that. I think linkage that creates synergy is one of the most important things we can work toward. A recent report from the Office of Science and Technology Policy focuses on the importance of transitions in efforts to advance the science, technology, and engineering workforce. In EHR the diversity continuum involving HBCU-UP, AGEF, CREST, and LSAMP is a model of linkages between programs addressing issues at these levels. We need to connect these programs up with activities in the education continuum also.



Dr. Sunley and her secretary, Tracie Lassiter

Before coming to NSF, you served as a mathematics faculty member, a department chair, and an associate dean. What advice would you offer a student in high school thinking about a career in science?

I would stress the variety of things that can be done with a strong background in mathematics and science. When a high school student is thinking about a career in science, he or she should explore what is needed to pursue that field. In addition, I would advise all students to take as many mathematics and science courses as possible. Failure to do this shuts the door on many excellent opportunities in careers of all types, not just those in science, engineering, or mathematics.



Dr. Sunley during the interview

What has been the most satisfying aspect of this position during your tenure?

The opportunity to learn the different perspectives of the communities with which EHR works. Serving in this position has provided me with the opportunity for broader contacts and a better understanding of the interests of people and groups with whom the other directorates have minimal interaction. I would like to think that I can help other NSF directorates understand these communities better. Developing partnerships and linkages within the Foundation is just as impor-

"I think linkage that creates synergy is one of the most important things we can work toward"

Please comment on any subject that you would like to include.

It is important that high school and college students be advised to take a lot of mathematics and science courses because they do not know what the future holds. I decided as a junior in high school to become a high school math teacher. I never dreamed that I would become a Ph.D. mathematician with a career at NSF helping to formulate national science and engineering policy.

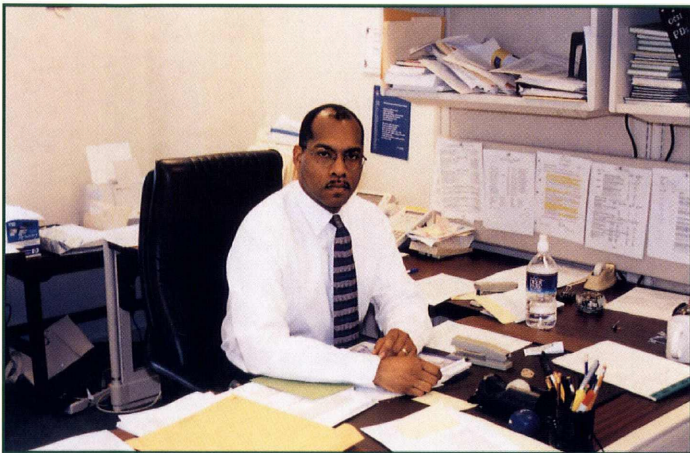
To meet the challenges of an ever-increasing technological society, all citizens need a solid grounding in math and science to participate in the decisions we must all make together.

A Conversation with Dr. Norman Fortenberry

Louis Dale

Dr. Norman L. Fortenberry began service as Acting Division Director of HRD in January following the retirement of Dr. Roosevelt Calbert. He continues to serve as Director of the Division of Undergraduate Education (DUE), a position he has held since 1996.

An appointment was made with Dr. Norman Fortenberry for an interview at 3:30 p.m. on March 9, 2000. As I entered his office he was seated at a computer, busy with work. After his greeting, he invited me to have a seat at a round table in a corner of the office where we began our conversation. He was relaxed and his answers to questions were precise and well presented.



Dr. Fortenberry at his desk

He was born in Yokosuka, Japan. His father was a U.S. Serviceman and he traveled a lot with his parents. At age 3, his mother reported that after watching a television program about an engineer he indicated that he wanted to be an "in-the-ear" when he grew up. Because of his father's travel, he attended high school in North Carolina, Colorado, Okinawa, Alabama, Missouri, and Louisiana. He received the S.B., S.M., and Sc.D. degrees (all in mechanical engineering) from the Massachusetts Institute of Technology. He taught at Florida A&M University before joining the staff at NSF. "Teaching is enjoyable and a great responsibility", said Dr. Fortenberry with a smile. He is married to Janet C. Rutledge, a Ph.D. in Electrical Engineering, and Program Director for the NSF Graduate Research Fellowship Program. They met as undergraduate students at

a conference of the National Society of Black Engineers. They are the proud parents of an eight-month-old son named Carter James.

As of today, you have served as Acting Director of the Division of Human Resource Development (HRD) for two months.

a. What have you enjoyed most about this job?

The opportunity to work with talented individuals, both outside and within NSF, who are committed to and enthusiastic about helping the Nation to fully utilize its human resource base, has been truly energizing.

b. What do you see as the greatest challenge facing the division?

I believe that the greatest challenge facing HRD is demonstrating the efficacy of our investment, not simply with respect to the numbers of minorities produced, but with respect to their academic and career outcomes. Of course, in reality, this is a challenge for all higher education programs. However, targeted programs have often suffered increased scrutiny and expectations. It's reality and we deal with it. Another major



Dr. Fortenberry meeting with LSAMP Group

challenge for the division is taking the research-based efforts for girls, women, and persons with disabilities to scale.

Most educators will agree that NSF in general and HRD in particular have been important forces for positive change in science and engineering education in underrepresented minority and minority-serving institutions. What is your vision for HRD in the year 2000 and beyond?

The National Science Foundation has two review criteria for all submitted proposals—What is the intellectual merit of the proposed activity and what are the broader impacts of the proposed activity? A key task for HRD is to leverage activities across NSF to increase attention to the second review criterion. In this way we should see increased participation by women, minorities, and persons with disabilities in the scientific and technological enterprise, including research and education.

Programmatically, HRD will continue development of the Ethnic Diversity Continuum, having programs which a) strengthen the educational infrastructure for high quality undergraduate instruction at minority-serving institutions, b) leverage alliances of institutions and attention to critical transition points to substantially increase production of significant numbers of minority SMET baccalaureate and doctoral degree recipients, and c) strengthen the research infrastructure of minority-serving institutions and the research competitiveness of the faculty at such institutions.



Dr. Fortenberry meeting with HBCU-UP Group

“the greatest challenge facing HRD is demonstrating the efficacy of our investment, not simply with respect to the numbers of minorities produced, but with respect to their academic and career outcomes”

HRD will also seek to build on the very dynamic and creative research base which exists in the programs for gender equity and for persons with disabilities to address the underutilization of women and persons with disabilities in the science and engineering workforce.

The Louis Stokes Alliances for Minority Participation (LSAMP) program is probably the best known underrepresented minority program at NSF. Do you believe the program should continue with its current focus or do you believe that it is time for a new direction?



Dr. Fortenberry and LSAMP Principal Investigators

The LSAMP has always had two broad goals: increased production of minority baccalaureates in SMET disciplines and increased production of minority doctorates in SMET disciplines. Necessarily, the program has had to focus on baccalaureate production. However, as the community gains more knowledge and experience in baccalaureate production, it makes sense to devote increased attention to the challenge of verifiable impact on graduate school entrance and success. LSAMP is a natural feeder to the Alliances for Graduate Education and the Professoriate (AGEP), the Integrative Graduate Education and Research Training program, and the Graduate Research Fellowships. We must devote greater attention to the linkages between these programs to maximize their overall effectiveness.

What advice would you give a minority student entering an LSAMP institution who is interested in a successful career in science or engineering?

There is the standard advice about studying hard and staying focused as well as participating in research and finding a mentor. However, the single most important piece of advice which I give to students is to accept responsibility for their own career. That means taking the time to research career options, taking the time to search out role models and mentors, taking the time to fully engage in all that their academic environment has to offer, and then looking for more. Jesse Jackson says that no one will save us, for us, but us. Well, no one will educate you, for you, but you. The bottom line is that it's your education and you have to make sure that you search out all available resources and squeeze all that you can from them.

"We must devote greater attention to the linkages between these programs to maximize their overall effectiveness"

You have served in a number of high level positions at NSF and are considered a role model for scientists and engineers who may be interested in government service. The number of minorities at NSF is smaller than expected by some citizens. A large number of dedicated minority scientists and engineers who serve as project directors for the programs administered by HRD, in addition to their professional duties, are not generally recognized for their efforts and contributions to the success of these programs. Do you believe that efforts should be made to recruit minorities for service at NSF from this group?

I disagree with your premise that the principal investigators and associated faculty within HRD programs are not recognized for their efforts and contributions. I think they are tremendously respected for what they accomplish and represent a talented resource for the Nation as a whole. But with respect to your question, yes. I believe that more minorities should seek opportunities to serve as program officers at NSF. One of the easiest ways is to sign up for email notification of position vacancies via NSF's Custom News Service at <http://www.nsf.gov/home/cns/start.htm>.

All of your formal training in higher education has been at the Massachusetts Institute of Technology. Who was your role model or mentor during this period of your life?

My research advisor, for all three of my degrees, was Dr. James H. Williams, Jr., who is currently School of Engineering Professor of Teaching Excellence at MIT. As an MIT alumnus himself, he understood the challenges which I faced because he had experienced them, and much worse, as an undergraduate. He is a man of immense talent in both research and education. He also has an incredibly engaging personal style. As one of the very few African American faculty (and very, very few in engineering) at MIT, he also knows how to walk the lonely path, and not only survive, but thrive.

My mentor was Dr. Samson S. Lee, who actually oversaw the operations of Dr. Williams laboratory. He provided sage advice on research, writing, presentations, and life.

My role models were my parents, who instilled deep convictions and values, overcame tremendous challenges in their own lives, and encouraged my sister and I to develop into independent thinkers, aware of who we were and from whence we came.

What do you consider to be the greatest accomplishment of your career to date?

Contributing to the recognition that talent knows no boundaries, that it exists in all kinds of places and all kinds of people. In my positions as a faculty member, as an NSF program officer, as executive director of the GEM Consortium, and as division director for both Undergraduate Education and Human Resource Development, my most fundamental task has been to seek out and develop talent. To the extent that I have been successful, I have accomplished something in my career.

Keys to Success in the LSAMP

Excerpts from the Westat Report

Carolyn Braswell

The Westat Report, a description and analysis of Best Practice Findings of Programs Promoting Participation of Underrepresented Undergraduate Students in SMET Fields, is based on work initiated by the National Science and Technology Council and supported by the National Science Foundation under contract number SED 92-55369.

Overview

The Westat report summarizes the findings of an exploratory study to identify "exemplary practices" in federally funded programs designed to increase the participation of minorities in science, mathematics, engineering, and technology (SMET) fields. This study serves two purposes: first to provide a rich description of what the projects do, and second to highlight the features that appear to make them especially promising. While programs from three federal agencies were included – the National Science Foundation (NSF), the National Institutes of Health (NIH), and the National Aeronautics and Space Administration (NASA) – this report focuses primarily on NSF's Louis Stokes Alliances for Minority Participation program (LSAMP). LSAMP is the major endeavor funded by the National Science Foundation to remedy the underrepresentation of minorities at the college level.

The LSAMP program constitutes a major departure from traditional scholarship programs. Rather than focusing on supporting individual institutions or supporting students through financial aid, LSAMP is more comprehensive and multidimensional.

- First, the NSF program stipulates the formation of Alliances, conceived as partnerships among academic institutions (universities, colleges, and community colleges), government agencies and laboratories, industry, and professional organizations.
- Second, LSAMP targets undergraduates who have shown interest or aptitude for SMET fields in high school, when they entered college, or during their college career. The program is not focused solely on students with an existing track record but attempts also to nurture those who have still to display their potential.

- Third, while providing some financial support, LSAMP puts major emphasis on offering various activities designed to help minority students fulfill their potential in college and to sustain their interest in SMET fields and graduate study through hands-on research experiences and interaction with other institutions in the Alliance.

Findings

Comparisons Among the Three Programs

The three programs examined in this study have a common goal: to increase the number of qualified minority members in SMET fields. But the means to reach this goal are very different.

The NIH-sponsored MARC program provides generous stipends to students who have demonstrated interest and ability in science and in research. Their only obligation during the last two years of college is to participate in research projects under the guidance of a research mentor, maintain high grades, and prepare themselves for admission to a graduate program from which they will seek to obtain a Ph.D. Although some of their activities may impact other SMET students on campus, who are invited to hear research presentations made by MARC scholars, the impact on the student population as a whole is not considerable.

The NASA program is more similar to LSAMP, although it is much smaller, more selective, and provides all participants with a stipend that even after it was cut back two years ago, is still much larger than what the majority of LSAMP participants receive. The obligatory summer internship at NASA centers guarantees additional income and also exposes the NASA scholars to research opportunities and contacts, which may lead to job offers or graduate fellowships. Because the number of NASA scholars is

small, the staff makes considerable efforts to help each student to succeed. But as is true of the MARC program, there is relatively little opportunity for the student body as a whole to participate in activities other than attending research presentations or ceremonial activities.

The LSAMP program is fundamentally different, and not only because of the Alliance structure. Increasingly, the staff has chosen to accept some students who had not distinguished themselves in their high school academic courses or when they first entered college. Stipends are often tied to academic performance, but more often to the performance of specific tasks, such as research assistance or tutoring. The primary emphasis in participating institutions is on retaining and graduating SMET students, although graduate study is stressed for qualified students.

Keys to Success in the LSAMP

Each of the LSAMP projects that Westat staff visited emphasized different features, largely because each targeted students with such different needs. However, looking across the projects visited, the study has identified a set of features that appear to lay the foundation for success.

Keys to LSAMP's Success

- Summer Bridge Program
- Research Experience
- Mentoring
- Drop-in Center
- Caring Staff
- Alliance Structure

By far the most successful feature of these LSAMP programs is the residential summer bridge program for graduating high school seniors. Typically, students receive a stipend to attend a 3- to 6-week session during the summer prior to college attendance. They enroll in "gatekeeper" courses, usually in math and science, and are taught study skills and time management.

For students who have successfully survived the freshman year, the program feature most often described as "most important" by staff and students is the research experience. The opportunity to participate in real, ongoing research projects was seen by some as the centerpiece of the program and the essential element in pro-

moting graduation and graduate enrollment.

In all LSAMP projects in this study, mentoring was seen as a major and important activity. Students were most enthusiastic about having a peer mentor during their first two years in college, because some found it difficult to relate to faculty mentors and were especially comfortable in discussing personal problems. Research mentors, on the other hand, were often seen as inspiring and valuable teachers as well as friendly and supportive adults.

Another feature is a drop-in center, usually a separate space with resource materials and computer facilities, where a graduate student or faculty member is present to answer questions and point students to resources. These centers, which are not usually available on every campus, often become popular meeting places where students can work together or simply socialize.

There is also considerable strength in the Alliance structure itself. For students, the opportunity to learn from others attempting to meet the same goals appeared to us to be a unique and valuable feature. For faculty, who often feel that they are "out there by themselves," the presence of "comrades in arms" provides both a psychological and a practical source of support.

But over and above specific program features identified as characteristic of successful projects is a more amorphous notion expressed in many of the interviews conducted on campus: the LSAMP project has a caring staff and is a place where students feel that someone, or many individuals, really cares about them. Closely associated with this characteristic is the existence of a community of LSAMP participants ready to support and help each other. Students, and to some extent faculty, are able to escape the anonymity that a bureaucratic institution, the university or college, imposes on them. Of course, all college students share these needs. However, the traditional undergraduate environment, especially the environment at institutions serving mainly majority students may pose special barriers for students who are from underrepresented minority groups and may be the first in their families to seek a degree in the SMET fields. LSAMP, as we saw it, has both purpose and passion.

"the LSAMP project has a caring staff and is a place where students feel that someone or many individuals, really cares about them"

Former U.S. Congressman Attends Research Conference

Vivian Hampton



The Honorable Louis Stokes, former U.S. Congressman from Ohio, was the Special Guest and Luncheon Speaker at the Fourth Annual North Carolina Louis Stokes Alliance for Minority Participation (NS-LSAMP) Undergraduate Research Conference. The event was hosted by Winston-Salem State University in Winston-Salem, North Carolina on April 14, 2000. The conference theme was "Sustaining the Vital Connection Between Research and Education in the 21st Century." Participating institutions included:

Fayetteville 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-Pembroke, Winston-Salem State University, and North Carolina A&T State University (lead campus).

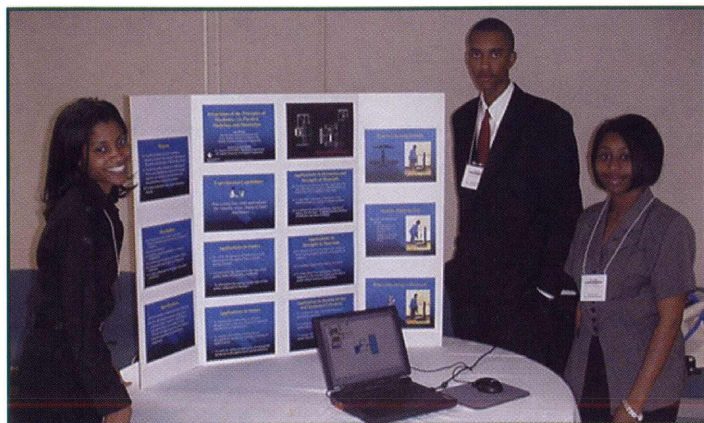
Additional conference speakers included: Dr. Norman Fortenberry, Acting Director, Division of Human Resource Development; Dr. A. James Hicks, Program Director of the Louis Stokes Alliances for Minority Participation; Dr. Howard Adams, President of H.G. Adams and Associates, Inc.; Dr. Edward Fort, Chancellor Emeritus, North Carolina A&T State University; and Dr. Carolyn Meyers, Vice Chancellor for Academic Affairs, and NC-LSAMP Project Director.

"I commend the National Science Foundation (NSF) for its generous sponsorship of the LSAMP Program, which significantly benefits underrepresented minority students in science, mathematics, engineering, and technology (SMET) disciplines throughout the United States"

**Congressman Louis Stokes
(Retired)**



State Representative Larry Womble, Dr. A. James Hicks, The Honorable Louis Stokes and Dr. Harold L. Martin, Sr.



Melody A. Tally, Jason A. Hughes and Shakira D. Sumpter



Dr. Edward B. Fort, Alicia D. Boozer, Dr. Howard G. Adams, The Honorable Louis Stokes and Shedrick B. Bessent

ACCOMPLISHMENTS



Alabama LSAMP

- Bachelor degrees in SEM fields awarded to underrepresented minorities participating the Alabama LSAMP program increased to 979 annually (124% of the baseline) resulting in a total of 6,394 degrees awarded to participants since 1992.
- Successfully implemented Summer Bridge Programs for high school students, Summer Internship Programs for undergraduate students, and Graduate Bridge Programs for beginning graduate students at three LSAMP graduate institutions.
- Published and distributed the annual Louis Stokes Alliances for Minority Participation magazine. The magazine was dedicated to Congressman Louis Stokes who retired from the US Congress after 30 years of service.
- Sponsored the 1999 LSAMP Summer Research Conference Reunion bringing together the LSAMP projects and speakers who participated in the first Summer Research Conference. The conference was attended by the California, Colorado, Florida/Georgia, Louisiana, New York, North Carolina, and WAESO alliances.
- Alabama LSAMP faculty and students participated in the Alabama Alliance for Graduate Education and the Professoriate Annual Graduate School Fair.
- Alabama LSAMP faculty and students participated in the First Historically Black Colleges and Universities Winter Research Conference.



California LSAMP

Foremost among CAMP achievements is the marked increase of students retained in the science and engineering majors and preparing for and enrolling in graduate school. To date, nearly 400 participants have enrolled in graduate and professional school. More Alliance-wide achievements may be seen on our individual page elsewhere in this booklet. Selected benchmarks place student achievement at the forefront:

SELECTED STUDENT HIGHLIGHTS

Dora Castaneda, UC Irvine, won a \$20,000 NSF Graduate Fellowship;
Veronica Reyes, UC Santa Barbara, won the SACNAS Vigil Poster Presentation Award;
Rebecca Vega, UC Santa Cruz, now enrolled at Stanford for graduate studies, was selected by faculty for the Frank Talamantes Science Prize;
Jose Otero, UC San Diego, won the SACNAS Vigil Poster Presentation Award;
Sharon Okonkwo, UC San Diego, received a Summer MIRT/Fogarty Training Grant;
Jose Valle, UC Irvine, won the first place poster award at the 1999 MAES conference;

FACULTY HIGHLIGHTS

CAMP Statewide Advisory Board member Martha McCartney, Professor of Engineering at UCI, is co-pi on the NSF Minority Graduate Education program, closely aligned with CAMP.

UCI's Ricardo Mileli, distinguished neurobiologist and CAMP mentor, has been awarded Spain's 1999 Principe de Asturias Prize for Scientific Research for discoveries that may lead to more effective treatments for depression and other mental illnesses.

CAMP SUPPORTED PROGRAM ACHIEVEMENTS

The Academic Excellence (ACE) Honors Program, UC Santa Cruz, substantively supported by CAMP, won the 1999 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. The award was presented at the White House in late 1999.

The SIMS (Summer Institute in Mathematics and Science) program at UC Santa Barbara, supported by CAMP-NSF, received for the second year a donation of 225 text books and other materials from Wiley Publishing Co., Inc., a value of more than \$5,000.

CORPORATE PARTNER DEVELOPMENT

Bayer provided funds for three summer researchers at UC Berkeley; Chevron provided funds for academic year research via the Chevron Scholars at UC Berkeley; Intel provided \$32,000 direct support for engineering research at UC Davis. Toshiba America Companies of Southern California funded the CAMP-Toshiba Scholarships for the fourth consecutive year. At Irvine, Mazda Foundation awarded seven \$5,000 scholarships to UCI students, all CAMP participants.



California State LSAMP

While we received our initial grant in October of 1993, we were unable to begin work with students until late in the Spring of 1994 and our target was 1500 underrepresented minority graduates in SEM in five years. During that Spring, we mapped out a strategy that we hoped would achieve that goal and began its implementation in the Summer of 1994. With the Spring Semester of 1999, five calendar years after we made and began implementation of our plan with real live students, we graduated 1473 minority students with SEM baccalaureates, 98.2% of our five year goal.



Colorado LSAMP

- Fifty-three percent increase since 1995-96 (215-330) in SMET Baccalaureate Degrees awarded to underrepresented minorities.
- Surpassing the 1998-99 projected number of SMET Baccalaureate Degrees awarded to underrepresented minori-

- ties by 17% (282 projected vs. 330 actual).
- Five percent increase from previous year (2,651 to 2,785) in SMET underrepresented minority enrollment.
 - Increase in average GPA for Level 1 underrepresented students from 1998 level of 2.75 to 2.87.
 - LS CO-AMP Research Presentations at AMP Research Conferences in Alabama and Florida.
 - Expansion of tutoring, peer advising, and mentoring programs at LS CO-AMP participating institutions.
 - Strong collaboration with the American Indian Science and Engineering Society's (AISES) student organizations at several LS CO-AMP institutions and AISES 21st Annual National Conference in Minneapolis, MN.
 - Co-Sponsoring of the AISES Regional and Hispanic Student Conferences at Fort Lewis College (February 99 and October 99).
 - Participating in and assisting the Heritage Institute with the National American Indian Science Bowl at the Air Force Academy at Colorado Springs.
 - Collaborating with Navajo Nation Rural Systemic Initiative to conduct summer outreach programs on the Navajo reservation, and at Fort Lewis College.

Georgia-College Fund LSAMP

- A 23 percent increase in SMET B.S. degrees awarded to minority students at Alliance Institutions
- A 100 percent retention of AMP Scholars in SMET at Alliance institutions
- Summer research internships were completed at nearly fifty national and industrial laboratories and universities by AMP Scholars and other SMET students at Alliance institutions
- All but one Alliance institution conducted summer bridge programs
- All but two Alliance institutions held student science research symposia
- Funds to support curricula reform activities increased by nearly \$250,000 at Alliance institutions
- Georgia State University, the sole non-HBCU in the Alliance, awarded five doctorate degrees in chemistry and one in physics to African Americans in 1998-99
- Two Alliance institutions, Spelman College and Morehouse College, ranked second and eleventh respectively among baccalaureate-origin institutions of African American Ph.D.s in SEM between 1991 and 1995
- The SMET enrollment at Atlanta Metropolitan College, the GALSAMP junior college partner, increased by 33 percent accompanied by a 65 percent transfer rate, the largest in the institution's history
- All Atlanta area Alliance institutions conducted SMET summer enrichment programs for students in the Atlanta Public School System, the pre-college partner of GALSAMP



Florida/Georgia LSAMP

- In 1998-1999 the Alliance institutions graduated 1613 students in SEM areas. This number represents > 300 percent increase over the 1991 baseline data.

- The Alliance's focus on summer research internships is bringing greater visibility to the project and the affiliated institutions. In the summer of 1999 more than 100 students were placed in internships at 52 sites across the nation.
- A key factor in the successes of FGLSAMP students is their retention in the SEM areas. In 1998-99, the progression/persistence rate for scholars was greater than 85 percent.
- The FGLSAMP Project participated in a Cross-Site Analysis conducted by WESTAT. The preliminary findings indicate that the Alliance is making progress toward achieving its goal of increasing the graduation rate of underrepresented minorities in SEM areas.
- The 1999 FGLSAMP Career EXPO was hosted by Alliance partner Albany State University. More than 225 students were in attendance and had the opportunity to participate in workshops, graduate school and internship fairs and interact with one another through poster and oral presentations.
- Two Alliance institutions, Albany State University and Florida A&M University received HBCU-UP awards to enhance teaching and learning the SMET areas and subsequently influence graduation rates and graduate school enrollment.
- In a joint effort, Florida A&M University and Bethune-Cookman College have received support from the U.S. Department of Education to establish Science Instruction Centers at both sites.
- Participation of undergraduate students as FGLSAMP scholars and associate scholars has increased from 454 in 1993 to 1173 in 1999.



Illinois LSAMP

The Fourth Annual Illinois Louis Stokes AMP Undergraduate Student Research Conference was entitled "Research, Discovery and Communication." The conference, held at Illinois Institute of Technology on April 9-10, 1999, featured students presenting poster exhibits and oral presentations. Mr. Charles Whitmore, Natural Resource Conservationist from Madison, Wisconsin gave the keynote address on Friday, April 9, 1999. On Saturday, April 10, 1999, Dr. Sylvester Gates, Jr., Professor of Physics, University of Maryland, was the keynote speaker. Conference attendees were greeted with welcome speeches by State Senator Emil Jones, Jr., and U.S. Congressman Luis Gutierrez on Friday evening.

- Betty Ooro, an Illinois State University (ISU) student is currently conducting research in partnership with her chemistry professor on a project examining how enzymes work in the body by manipulating clusters of the chemical element molybdenum.
- Dorain Thompson, Shana Lee and Natasha Lang presented their research project/abstracts entitled "The Effects of Antibiotics on Host Immune Response" at the International Meeting of the Association for Gnotobiotics in Stockholm, Sweden in June 1999. In addition, a manuscript from their work has been accepted for publication in the journal *Microecology and Therapy*. These students attend Southern Illinois University-Edwardsville (SIUE) under the mentorship of Professor Dennis J. Kitz.
- South Suburban College (SSC) students Jeanne Davis, Marquita Hall, Jeffrey Liddell and Sheba Washington received scholarship awards for their continued success in

- meeting their educational goals academic year 1999.
- Leo Phifer and Orman Greaves who are both seniors from Illinois Institute of Technology (IIT), majoring in electrical and computer engineering won first place in the 1999 IIT Undergraduate Research & Presentation Conference on April 23, 1999. Their project was entitled "Remote Laboratory Operation." In addition, they received monetary awards and memberships in the Sigma Xi Honor Society for their first place showing.
- Northeastern Illinois University (NEIU) continues to sponsor student research in Mathematics, Earth Science, Physics and Chemistry. Research projects were conducted by Yvette Shiu, under the direction of Dr. Karen Bartels, entitled "Geochemistry of Carbonate in Amygdaloidal Basalts". "Chaotic Oscillations in Liquid Helium-II Counter Flow Jets", by Jermont Montgomery, under the direction of Dr. Paul Dolan.
- St. Augustine College organized their first workshop (spring 1999) to enhance mathematics education and to encourage their students to study mathematics. The students learned new mathematical concepts as well as improved their self-confidence. In fact, several of the students now serve as tutors under the supervision of the Mathematics Department.
- A Summer Science Institute (SSI) program was conducted from June 9, 1999 thru August 6, 1999 at Malcolm X College (MXC) entitled "Introduction to Research" where participants attended workshops on Study Skills, Orientation to Scientific Research, Application of Mathematical Principles & Statistics in Evaluating Data, and Poster Design & Preparation.



Louisiana LSAMP

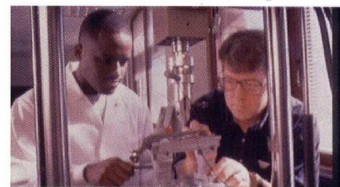
DEGREE ATTAINMENT. The main goal of the Louisiana Alliance is to double the number of minority SMET degrees awarded LS-LAMP institutions between 1994-95 (baseline) and 1999-2000 (from 482 to 964). The degree production within LS-LAMP from the baseline year (94/95) through the program's fourth year (98/99). Degree attainment of the Alliance showed an increase of ~17% in Year 1 (95/96) an increase of ~6% in Year 2 (96/97), and an increase of ~12% in Year 3 (97-98), and an increase of ~7% in Year 4 (98/99). Over the LS-LAMP project period (4 years), the average annual minority, SMET BS degree production has been approximately 92% of the target. One of LS-LAMP's most astounding impacts on Louisiana is the number of minority and non-minority SMET bachelors degrees produced by LS-LAMP partner institutions compared to non-LS-LAMP institutions. In 1998-99, LS-LAMP institutions produced 632 more minority and 882 more non-minority SMET bachelors degrees than non-LS-LAMP institutions. **ENROLLMENT.** Systemic and holistic mentoring as embodied by the nationally recognized Timbuktu Academy has contributed to the increase in minority SMET enrollment. The minority, SMET enrollment during 98/99 was 4,765. **RESEARCH ACTIVITIES.** Student participation in summer research programs is a vital component of LS-LAMP. Sixty-three students participated in LS-LAMP supported research opportunities at Tulane University, Louisiana State University and LUMCON. Over 80% of LS-LAMP supported scholars have participated in research activities. **CONFERENCES.** The Louis Stokes

Louisiana Alliance for Minority Participation and the Department of Energy's EPSCoR program jointly sponsored a student and faculty research conference on March 5 and 6, 1999. The conference, "Sustaining Competitiveness through Systemic Mentoring," attracted over 200 students and faculty from around the State. **PUBLICATIONS.** The LAMP Journal, a quarterly newsletter of the Louisiana Alliance, continues to be published since Fall 1997. Integration of Research and Education and Accountability in Teaching and Learning: The Covenant has been published on the World Wide Web (<http://www.phys.subr.edu/senate>). Other articles include Early Guidance Pays Off, published in Resource Magazine (April, 1998); a contribution of D. Bagayoko in Workforce for the Future, published by NSF (1998-99); Mentoring: A Strategy for Increasing Minority Participation (<http://www.phys.subr.edu/timbuktu.htm> and in the Proceedings of the national, NSF-sponsored conference on the role of social and behavioral sciences (SBS), 1997); "Writing for Success, a comprehensive "user-friendly manual for effective communication," McGraw-Hill Companies, Inc., 1998 (ISBN No. 0-07-154196-9). [The role of the mastery of the applicable language (communication skills) in learning, research, and SMET careers explains the rationale for this important product.] The MainSTey Activity Workbook, and Mapping the Concept of Change (submitted to The Science Teacher). For additional information on the Louisiana Alliance please visit our website at www.ls-lamp.org



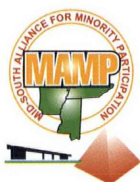
Maryland LSAMP

- Minority SMET degree production increased to 120 percent over the 1994 baseline.
- Minority SMET enrollment rose to 3,177 for the 1999 fall semester.
- USM LSAMP scholars were inducted into numerous honor societies that include Phi Kappa Phi National Honor Society, Phi Mu Epsilon Mathematics Honor Society, Golden Key Honor Society, Tau Beta Pi Engineering Honor Society, Sigma Pi Sigma Physics Honor Society, and Upsilon Pi Epsilon Computer Science Honor Society. Also, many USM LSAMP scholars were inducted into the prestigious honor society of Phi Beta Kappa.
- Several USM LSAMP scholars published articles and abstracts in noted scientific journals that include Science, Protein Science, Journal of Molecular Biology, Plant Phytology, and Chemical Senses. Scholars have also presented at several national conferences. A few of them include the National Conference on Undergraduate Research (NCUR) at the University of Rochester and the Leadership Alliance SR-IEP Annual National Symposium in New York, New York.
- USM LSAMP scholars received fellowships and scholarships from many prestigious organizations. In 1999, forty percent of the GEM Fellowships in the country were awarded to USM LSAMP scholars. Included among the scholarships and fellowships received by LSAMP scholars are the Pfizer Scholarship; the Brandeis University Howard Hughes Summer Fellowship; the Whitaker Fellowship for Graduate



Study in Biomedical Engineering; the Lucent Technologies Fellowship; and the UNCP*MERCK Science Initiative Undergraduate Science Research Scholarship.

- USM LSAMP scholars had internships at various universities, national laboratories, federal agencies, corporations, and industries. Scholars interned at the following universities: Carnegie Mellon University; Massachusetts Institute of Technology (MIT); University of Maryland, Baltimore County; University of Maryland, College Park; University of Maryland Eastern Shore; Brandeis University; Duke University; University of Pittsburgh; Virginia Commonwealth University; Yale University; University of Pennsylvania; Princeton University; Johns Hopkins University; and University of California at Berkeley. Other LSAMP scholars interned at the following national laboratories, federal agencies, corporations, and industries: Central Intelligence Agency (CIA); Forgarty Minority International Research Training (MIRT) at Lancaster University; National Institute of Standards and Technology (NIST); National Eye Institute; Lockheed; National Institutes of Health (NIH); Food and Drug Administration (FDA); Pfizer; Johns Hopkins Applied Physics Laboratory; Computer Science Corporation (CSC); Ford Motor Company; Howard Hughes Medical Institute at the University of Colorado at Boulder; Howard Hughes Medical Institute at the University of Maryland, Baltimore County; 3M; Novelle; Qualcom; Mayo Clinic; and the Institute of Human Virology.



Mid-South LSAMP

- MLSAMP has increased the number of bachelor's degrees awarded to minority students in science, mathematics, engineering and technology (SMET) disciplines by 65% overall from 422 in 1996 to 698 in 1999. Minority SMET enrollment at Alliance institutions has also increased substantially by 45%, from 4,367 in 1996 to 6,353 in 1999.
- MLSAMP held its first Annual Summer Conference hosted by the University of Tennessee, Memphis, July 1999. This conference was attended by over 200 administrators, faculty, and students from Alliance institutions.
- Memphis Partners, Incorporated, a MLSAMP community based partner responsible for securing SMET summer internship opportunities for MLSAMP students, held its annual Corporate Luncheon, August 1999, for employers of MLSAMP summer interns. The guest speaker for this event was Dr. Donnie Mitchell, Director of Public Services and head of the Mayor of Memphis' Summer Internship Program.
- MLSAMP students at the University of Memphis were among a select group of students to participate in a planning survey for the development of a new \$20 million Federal Express Business Information Science Center on their campus. The center will house up-to-date technology classrooms, laboratories, and space for videoconferences and meetings.
- Several MLSAMP presented their results of their research or attended several scientific conferences including the Tennessee Academy of Science, Experimental Biology Conference, Minority Biomedical Research Support (MBRS) Conference, American Society of Mechanical Engineers

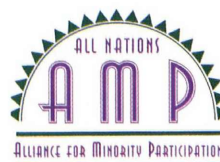
Conference and National Society of Black Engineers Conference. A Christian Brothers University MLSAMP student, Thomas J. Malone, won 1st place in an Impromptu Design Contest at the 1998 American Society of Mechanical Engineers (ASME) Regional Conference.

- Two MLSAMP coordinators received honors from their academic institutions. Dr. Paul Shiue, Associate Professor of Mechanical Engineering at Christian Brothers University was selected as Tau Beta Pi Professor of the Year. Dr. Donald Franceschetti, Professor of Physics and Chemistry at the University of Memphis received the Meritorious Faculty Award from the College of Arts and Sciences and published papers in the Journal of Chemical Physics, Physical Review Letters, Brian and Behavioral Sciences and Physics.
- MLSAMP students from LeMoyne-Owen College and Tennessee State University attended the first Annual Tennessee Historically Black Colleges and University Conference, May 1999, sponsored by Oak Ridge National Laboratory in Oak Ridge, Tennessee. Students attended several workshops informing them about summer internship, graduate school employment opportunities available to them at Oak Ridge National Laboratory.



Mississippi LSAMP

THE NUMBER OF B.S. DEGREES IN SMET DISCIPLINES GRANTED TO MINORITY STUDENTS MORE THAN DOUBLED FROM THE BASELINE YEAR, FROM 242 IN 1992 TO 592 IN 1999. The Mississippi Louis Stokes Alliance for Minority Participation is proud of the contribution it is making to diversification of the nation's scientific workforce. Furthermore, we are confident that the number of minority science professionals educated in Mississippi universities will continue to increase because MLSAMP is creating a legacy of institutional environments that support minority empowerment and achievement in the sciences.



All-Nations LSAMP

Technology - Tribal colleges and universities expect to be at the cutting edge of technology instead of the bleeding edge, thanks in part to a National Science Foundation project for minority-serving institutions funded through EDUCAUSE. Steve Dupuis, who is an All Nations Louis Stokes Alliance for Minority Participation (ANLSAMP) Program Manager, is the project coordinator for the tribal colleges on the Advanced Networking Project with Minority-Serving Institutions (AN-MSI). EDUCAUSE is an international, nonprofit association. With this project, EDUCAUSE hopes to enable minority institutions to use technology to enable transformational change in higher education. The overall goal of this project is to assist minority-serving institutions as they develop the campus infrastructure and national connections to become full participants in the Internet-based "Information Age." This valuable collaboration between EDUCAUSE and ANLSAMP will support

ANLSAMP's overall goals.

Data - ANLSAMP has recently completed Phase I of the AMP grant with remarkable results. Not only did the ANLSAMP program double the number of American Indian students completing a Bachelor degree in science, mathematics, engineering, or technology, they exceeded the goal. Data collection efforts have made tremendous strides in validating the accomplishments of tribal colleges towards graduating American Indian students in the science, mathematics, engineering, and technology fields (SMET). In order to corroborate our effort we will be submitting articles to professional journals in Higher Education and Sociology this summer. The ANLSAMP was also instrumental in the AIHEC data collection effort. In preparing for Phase II, the ANLSAMP will be contacting new partners in order to update their data bank. The new grant is written with the goal of working with all of the tribal colleges in the U.S. in an effort to increase the number of SMET programs offered at tribal colleges.

NWPETE - As of November 1, 1999 NW PETE (Partnership for Environmental Technology

Education) has moved to Salish Kootenai College under the ANLSAMP's umbrella. The collaboration between NW PETE and ANLSAMP will increase the opportunities for education and training for tribes and tribal colleges in the growing environmental arena.



New Mexico LSAMP

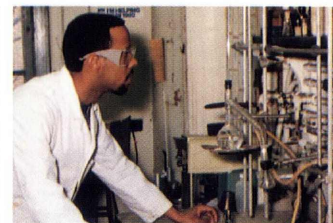
- In 1998/99, 474 degrees were granted to underrepresented minorities in SMET fields, up 87% over the baseline of 253 degrees in 1992/93. The percent of SMET B.S. degrees earned by minority students increased from 23.7% in 1992 (baseline) to 35.5% in the 1998/99 academic year.
- New Mexico LSAMP hosted Dr. Howard Adams, the former Executive Director of the National Consortium for Graduate Degrees for Minorities in Engineering and Sciences, Inc. (GEM) as he presented workshops at five of the state's universities. Each campus chose the workshops most suitable for their students, and topics ranged from "Creating an Enabling Campus Climate," to "Preparing for Graduate Studies" and "Academic Gamesmanship: How to Play and Win in College."
- Dr. Anthony Sena, LSAMP coordinator at Northern New Mexico Community College was honored with the 1999 SACNAS Community College/Tribal College Mentor Award at the annual SACNAS conference. Sena was honored for his work in the development of innovative programs that support minority students in pursuit of scientific careers including the college's undergraduate research experience, the Friday Science Academy, and the Science Olympiad.
- Over 300 students, faculty, and administrators attended the New Mexico LSAMP Annual Statewide Student Research Conference held in September 1999. Keynote speaker was the late Dr. Frank Dukepoo. Workshop presenters included Dr. Larry Scadden, NSF; the director of New Mexico CETP, and local faculty. Student presentations showcased the undergraduate student research being done across the state.

- LSAMP student Royce James was one of three U.S. Physics students selected to present their research at the International Conference of Physics Students in Helsinki, Finland, August 14-20, 1999. All expenses were paid by the Society of Physics Students. He will be presenting his on-going research in Space Plasma Physics under the mentoring of Dr. Shing Fung at NASA-Goddard, and Dr. Robert Liefeld at NMSU.



New York City LSAMP

- Completion of the NYC LSAMP SMET Pipeline: The addition of the CUNY Graduate School and University Center extends LSAMP support for CUNY's talented SMET students through their quest for the doctorate. LSAMP is engaging New York City's students in research as early as middle school. College and graduate stipends are significant and will soon be enhanced by LSAMP-generated private sector grants.
- An expanding Undergraduate Research Program and Increases in Institutionalization: 165 CUNY undergraduates conducted research in faculty laboratories under NYC LSAMP auspices bringing the 1992-1999 cumulative total to 519 LSAMP research scholars. All 165 research scholar positions have been institutionalized, as have 330 sections of restructured courses, learning centers and peer tutors throughout CUNY, NYC LSAMP activity coordinator positions on all 16 undergraduate campuses, and the NYC LSAMP central office.
- A Growing Cadre of Mentors: 142 CUNY faculty members served as NYC LSAMP mentors during the 1998-1999 academic year. NYC LSAMP recognizes that learning partnerships with faculty are crucial to keeping students in SMET studies to the baccalaureate level and beyond. It continues to seek strategies and incentives for involving instructors in this essential aspect of teaching.
- Enriching SMET Education Through Partnerships with Government Agencies and Other Funded Programs: The NASA GISS Institute on Climate and Planets, of which NYC LSAMP is a founding collaborator, has been refunded for 1997-2000. This model pipeline program engages CUNY faculty and students in cutting edge research with NASA scientists; a collaborative enrichment partnership with Brookhaven National Laboratory offers CUNY students summer and academic year opportunities to work alongside Brookhaven's scientific, technical, and professional staff; the Urban Systemic Initiative, dedicated to reforming SMET education in the New York City school system, is an increasingly important partner as NYC LSAMP works to increase the preparedness in SMET disciplines of students entering CUNY and to train CUNY students to be precollege SMET teachers.
- A Key Role in Important Conferences: The NYC LSAMP co-sponsors and participates in campus based conferences, CUNY wide meetings and national meetings; The NYC LSAMP co-sponsors and participates in the LAESA-SHPE High School leadership Conference, CUNY Science



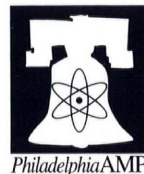
Conference, and The Urban University Pathway to Careers in Science for Minority Scientists and Engineers.



North Carolina LSAMP

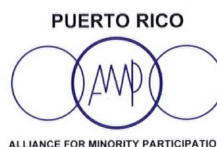
- Overall enrollment for underrepresented minority students increased by 9%, while enrollment for Native American students increased by 11%. Records for freshmen enrollment were set at some institutions, and based on high school graduation trends for the next ten years, the University of North Carolina system expects to experience record enrollment growth at each campus.
- The Third Annual Summer NC-LSAMP Research Program for Undergraduates was hosted by North Carolina State University in conjunction with the Engineering Research Center for Advanced Electronic Materials Processing, which provides early exposure to a graduate/postgraduate environment.
- North Carolina Central University hosted the Third Annual NC-LSAMP Student Research Conference in Durham, N.C. on April 16, 1999. Faculty-mentored research projects were presented by 79 students (poster and oral presentations). Total attendance at the Conference in 1999 was 310 (students and faculty), which represents a 33% increase in overall attendance since 1998.
- Again this year, community college students participated in the annual research conference, and for the first time, SMET students at Bennett College and Shaw University (HBCU institutions) were invited to share their research projects. Keynote speakers included: Dr. Luther Williams, Assistant Director for Education and Human Resources, National Science Foundation; Dr. Julian M. Earls, Deputy Director, NASA Lewis Space Center; and Mr. Harvey Gantt, Gantt Huberman Architects. In addition, Conference participants had a firsthand opportunity to examine a comprehensive exhibit of the CREST Program at North Carolina A&T State University, and interact directly with CREST staff.
- Twelve (12) SMET students representing three NC-LSAMP schools presented faculty-mentored research projects at the Alabama LSAMP Summer Internship Research Conference on August 2, 1999, at the University of Alabama in Birmingham. A mathematics major from Fayetteville State University, and a major in chemical engineering at North Carolina A&T State University were first place winners in the Alabama LSAMP research competition.
- The University of North Carolina at Pembroke hosted the 1999 NC-LSAMP Summer Bridge Program with the largest number of students served, and 50% of these students were Native Americans. Among students who completed the Bridge Program in 1997, 1998, and 1999, 100% are currently enrolled in a SMET degree program at a partner institution.
- Recruitment involving parents and high school counselors facilitated expansion of the Alliances of Learning and Vision for Underrepresented Americans (ALVA) Bridge Program to serve 13 entering freshmen and two African American and Native American sophomores. Placements were made with Sandia National Laboratories, Livermore, CA; JPL, Pasadena, CA; IBM, Research Triangle Park, NC; and a Native American-owned, certified MBE/WBE/DBE scientific firm in Pembroke, NC. NASA-PAIR funded the two sophomores. Each student is now enrolled at a partner university.
- The North Carolina General Assembly appropriated \$1M to

develop Enrollment Management Plans for five HBCU institutions within the UNC-System, and the University of North Carolina at Pembroke (Native American-serving institution). Five of the schools which will utilize these special funds are members of NC--LSAMP. Plans are now in progress to systematically impact enrollment for all degree programs at each of these institutions, including SMET fields.



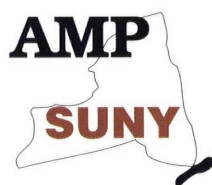
Philadelphia LSAMP

- University of Pennsylvania awarded four (4) African Americans and one (1) Hispanic Ph.D. degrees in Engineering during the 1998-99 academic year.
- Delaware State University has recently approved two new programs, Biotechnology and Information Technology. The University anticipates 150-200 new SEM majors to participate in these programs.



Puerto Rico LSAMP

- In academic year 1998-99 PR-LSAMP institutions awarded 2,789 BS degrees in SMET. This figure represents a 63% increment from baseline figure of 1,709 in 1991.
- Undergraduate SMET enrollment at PR-LSAMP institutions has almost doubled, from 12,572 in 1991 to 24,997 in 1998.
- The average SMET graduation rate for UPR institutions was 62%, above the national average of 51%.
- PR-LSAMP institutions contributed 16% of the baccalaureate degree graduates nationwide that received a Ph.D. in SME between 1993 and 1997.
- PR-LSAMP offered three national SMET undergraduate curriculum conferences in coordination with Colorado-LSAMP, SUNY-LSAMP and Louisiana-LSAMP.
- Percentage of satisfactory grades in traditionally difficult SMET courses significantly increased with the use of cooperative learning, the development of study/learning skills within the context of the course, and the use of technology in the classroom, such as the graphic calculator.
- Four hundred and twenty four (424) stipends were awarded for students to participate in research experiences.
- A total of 283 students presented their research projects in the annual Puerto Rico Interdisciplinary Scientific Meeting (PRISM), with additional 280 students attending the activity.
- One hundred forty eight (148) stipends were awarded to low-income students to help them defray their costs of education.
- Two-hundred fifty four (254) students served as mentors to freshman and sophomore SMET students

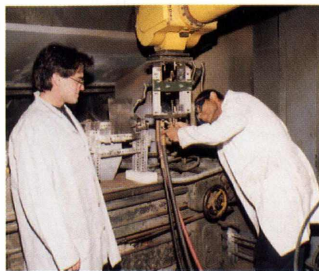


SUNY LSAMP

- An overall in degree production of **33% from baseline**.
- An increase in minority SMET enrollment to **2387** with an

increase of **86%** from last year and **95% from baseline**.

- Strong financial and programmatic commitments by campuses to SUNY LSAMP as seen by cost share amount of **\$2,415,121** that is now **345%** of funding amount.
- Funding of an **MGE proposal** in which SUNY LSAMP is a key player and major partner.
- Funding and implementation of activities to increase interest in graduate study and in the professoriate through the winning of an **AMP Supplemental Grant**.
- Development of a new model to bridge the gap between community college and engineering colleges called **EngiPrep** using corporate funding from **BP Amoco**.
- Development of a wide range of innovative courses and workshops to teach scientific concepts and improve gatekeeper course grades for SMET students.
- SUNY LSAMP retention rates for students are substantially higher than for other students at their institutions of for national retention averages.
- **Increases in number of students** receiving AMP stipends, academic support services and research placements.
- In-depth study by the program evaluator and staff and students of tutoring and mentoring components to judge most effective models and best practices.
- A dramatic increase in faculty development and course restructuring activities to increase the quality of teaching in the SMET disciplines.
- Implementation of the **Minority Professoriate Initiative and Post-Doctorate Minority Fellowship** program.
- Increase in the number and depth of involvement with partner programs through **NSF, (LICIL, RAIRE, MGE, ERC, LUCID), NIH (MARC), New York State (C STEP)**, to share resources and reach shared goals.



TEXAS LSAMP

- Improving the higher educational experience for minority SMET students, improving their retention in college and in SMET disciplines, and increasing minority SMET BS degrees awarded, have been goals toward which all the TX AMP partner institutions have worked since the 1991 inception of the Texas AMP. Between 1992-98 AMP Program participation has contributed an average increase of over 28% to the 1st year retention rate of minority SMET students.
- Considerable challenges to targeting and implementing AMP goals, were imposed by the 1996 5th US Circuit Court Hopwood decision & its interpretation by the TX Attorney General* The rethinking and redesigning AMP program implementation was required on almost all partner campuses in order to sustain positive outcomes in post-Hopwood years.
- Successful strategies have included a broad range of variations across partner campuses in (1) Mentorship and tutoring programs, (2) Undergraduate research opportunities, and (3) Bridge programs.
- In the academic year 1998-1999, the 12 Texas AMP institu-

tions enrolled 3,926 underrepresented minorities in SMET degree programs.

- During 1998-1999, four TX AMP institutions graduated 635 underrepresented minorities with SMET baccalaureate degrees.
- TX AMP experienced a 108% growth rate in the BS graduation numbers of underrepresented minorities in SMET between 1991 and 1999.
- Texas AMP industry partners awarded \$1,699,847 in scholarships and \$178,000 in internships during the 1998-1999 academic year.
- AMP partner institutions have continued to institutionalize increasing percentages of the support for AMP program implementation. Institutional cost sharing in 1998-99 reached \$3,185,794.36, almost tripling the 1997-1998 institutional cost sharing of \$1,127,947.62.
- AMP has supported the development of curriculum through Phase One, a summer bridge program aimed at engaging new freshman minority students in the mainstream of Engineering from the very start of their college experience in order to increase retention. In Summer 2000, the program will pilot a newly developed 2-credit Introductory Engineering course to be taken in conjunction with a pre-calculus for approximately 55 AMP students. The course will feature teaming, innovative engineering projects and Matlab, and will be offered to the general population of pre-calculus freshman engineering students beginning Fall 2000.
- In 1998-1999, Texas AMP laid the foundation for its web site and is continuing to develop and update it's information. Texas AMP's web site can be found at amp.tamu.edu.
- Texas AMP institutions have participated in the following additional NSF programs over the last seven years: Texas Collaborative for Excellence in Teacher Preparation, Texas Rural Systemic Initiative, South Texas Advanced Technology Education, the Foundation Coalition, and the AMP Virtual Institute Center.

*Cheryl J. Hopwood vs. State of Texas, March 1996, 5th U.S. Circuit Court of Appeal & TX Attorney General 8/96 interpretation that all affirmative action programs are illegal, and that only race-neutral policies may be used in admission, financial aid, scholarship, recruitment and retention programs



The University of Texas System LSAMP

- Development and dissemination of methods used to assess course effectiveness/curricular reform have continued. The ICE2 model, modified from the Puerto Rico LSAMP, has been shared with all LSAMP partner institutions as well as other Alliances.
- The UT System LSAMP held its first student research symposium, "Creating Pathways for Student Access" in August on the campus of the University of Texas at Austin. Dr. Renato Aguilera from the University of California at Los Angeles and Dr. Antonio Garcia from Arizona State University gave the keynote addresses. Over 50 students participated, with 23 presenting posters and eight delivering orals. In addition, Dr. A. James Hicks, NSF LSAMP Program Director, addressed the ALC and the ETF.
- Several LSAMP research students presented papers at the

regional meetings of the American Physics 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, American Chemical Society and SACNAS.

- The UT System LSAMP web site has been completed: www.utep.edu/AMP.
- In the past year, we have worked with all partner institutions to set-up a mechanism whereby the institutions are represented at a single recruiting booth for joint graduate school recruiting activities. In addition, all UT System graduate schools are linked through a special LSAMP web site at the University of Texas at Austin: www.utexas.edu/ogs/outreach/amp.
- A joint effort between UT System LSAMP and the College of Engineering at the University of Texas at Austin to secure funding from Marathon Oil to support student research has been undertaken.
- The Summer Bridge and Student Research Programs continue to be supported and successfully prepare UT System

LSAMP students for graduate school and the work force.

- Partner community colleges have begun retention initiatives aimed at second-year SMET students.



**WAESO
LSAMP**

Our overall five-year goal is to double the number of under-represented SMET baccalaureates to 1,404 in the year 2001 by gradually raising the yearly rate of increase. We have been tracking our progress to forward this goal by determining the rate of SMET baccalaureates awarded to African Americans, American Indians, and Hispanics within our region. Our target for the third year was to raise our baseline value of 702 SMET baccalaureate degrees awarded annually to African Americans, American Indians, and Hispanics to 904 at the end of year 3. Our alliance reports an annual rate of 991 SMET baccalaureates at the end of year 3 showing that we exceeded the projected increase by 43%.

Linkages with Programs in the Diversity Continuum

Alabama LSAMP

- Alabama LSAMP has formed linkages with the Historically Black Colleges and Universities Undergraduate Program (HBCU-UP) projects at Albany State University, Oakwood College, Miles College, and Tuskegee University. These linkages include sharing ideas and projects involving research for undergraduate students. A number of these project directors attended the LSAMP Executive Committee meeting. Alabama LSAMP faculty and students participated in the HBCU-UP Winter Research Conference.
- Alabama LSAMP is negotiating with the CREST program at Tuskegee University to serve as a feeder for the CREST Ph.D. programs.
- Faculty and students from the Alabama LSAMP program participated in the Annual AGEP Graduate School Fair.
- The Alabama LSAMP program has established linkages with the AGEP program. These linkages include efforts to distribute graduate school information to Alabama LSAMP student and to provide a smooth transition for students from LSAMP institutions to AGEP graduate institutions.

California LSAMP

In 1998-99 two new important linkages to NSF Human Resource Development programs were initiated. The Alliances for Graduate Education and the Professoriate (AGEP) (formerly MGE) and the CREST center at Cal State L.A., CEA-CREST, are mutually beneficial and promote NSF and institutional goals to increase the number of underrepresented students in the SMET faculty ranks and research careers. CAMP will build on the tradition that ten percent of all Ph.D.'s awarded in the nation are from the University of California. With increased focus on preparation for graduate school, particularly through the laboratory research experience and associated technical writing for publication, CAMP fosters progress toward the goal of substantially increasing motivated students for service in academia. Nurtured by programmatic synergy, CAMP continues to evolve

in scope and influence to form the core of retention and graduate school preparation. Expanded opportunities for student development will be also afforded by UC LEADS, an initiative advanced by the UC graduate deans. In their varied forms, UC programs motivate participants toward continued advancement in their disciplines through a cohesive set of opportunities, including internships, fellowships and mentored laboratory research.

California State LSAMP

In December of 1999, NSF again brought together directors from LSAMP, CREST, MGE and HBE and stressed the concept of a seamless pipeline. In the CSU LSAMP we have repeatedly stressed this idea and faxed or emailed information about the CEA CREST program based at CSU Los Angeles, and we have publicized other opportunities to pursue related studies and internships in appealing venues such as University of Puerto Rico, Bermuda, FAMU and University of California campuses. We went one step further at our annual January conference of CSU and Community College coordinators and invited Dr. Carlo Robles, Director of CEA CREST program, to speak to our entire assembly and to answer questions our coordinators may have had about the program. We are beginning to implement reporting schemes that will permit us to track what individual students at the various campuses are doing in response to these opportunities.

Georgia-College Fund LSAMP

- The NASA-funded PAIR program and the NSF-funded CREST Program at Clark Atlanta University provide educational and research opportunities in earth systems science which are enhanced by a partnership with the University of Oklahoma
- The NSF-funded MIE Program at Spelman College encourages broad institutional reforms that strengthens the environment and academic offerings for Alliance participants at that institution as well as LSAMP members in the other Atlanta

University Center (AUC) institutions

- The Office of Naval Research-funded Program for Research Integration and Support for Matriculation to the Doctorate (PRISM-D) at CAU has developed five-year BS/MS degree programs in SMET available to LSAMP participants at that institution as well as those at the other AUC institutions
- The Naval Research Laboratory provides summer research opportunities for students at all of the Georgia LSAMP institutions
- The Committee on Institutional Cooperation Summer Research Opportunity Program provides opportunities for Georgia LSAMP scholars at the institutions of the Big 10 and the University of Chicago
- Opportunities for international research training and studies abroad are provided to students at two Georgia LSAMP institutions through the School for International Training Packard Scholarship Program. Discussion to broaden the opportunity to other Georgia LSAMP participants are underway
- Through the Atlanta University Center Minority Access to Research Career (MARC) and the NSF-funded Center for Theoretical Studies of Physical Systems at Clark Atlanta University, Alliance students are provided additional opportunities for research participation and financial support
- Three Alliance institutions are partners with the MEDIC-B program at Indiana University
- The NSF-funded Undergraduate Program at Clark Atlanta University provide paid SMET research internships for LSAMP Scholars

Florida/Georgia LSAMP

The FGLSAMP Project has established linkages with other LSAMP projects through the sharing of published materials and in participation activities designed to enhance the undergraduate experience and transition to graduate school. FGLSAMP students presented their research experiences at the 1999 Summer Research Conference hosted by the Alabama LSAMP Project. At this conference, the project director presented a tribute to the LSAMP Program to an audience comprised of faculty, staff and students from more than nine LSAMP institutions. Involvement with the CREST program is primarily through summer research with CREST faculty. The Florida MGE project is based at the University of Florida. Linkage with this project is through summer research and special workshops. Florida A&M University and Albany State University received awards through the HBCU-UP Program in 1999. LSAMP faculty will collaborate with HBCU-UP faculty and staff through co-sponsorship of enhanced teaching and learning technique workshops. Student involvement will be through the freshman orientation course specifically designed for SMET students and use of the Academic Learning Center. In addition, FGLSAMP has established a connection with the FCETP Program supported through the Division of Undergraduate Education. Faculty, staff, and students in these projects collaborate in workshops and professional development forums.

Louisiana LSAMP

LS-LAMP continues to expand its array of partnerships with public and private institutions and organizations, including colleges and universities, community colleges, school systems, federal/state/local government agencies, national science and engineering laboratories, and professional organizations.

LS-LAMP institutions exchange students (summer research

activities), share faculty (NSF supported Joint Faculty Appointments Program [JFAP]), and conduct joint research (research cluster projects through EPSCoR and Board of Regents Support Fund activities). Special attention is given to effective collaboration of LS-LAMP with other student development efforts on participating campuses across the state of Louisiana. At Southern University in Baton Rouge, for example, the campus LS-LAMP program synergizes with its relatively new Historically Black Colleges and Universities-Undergraduate Program (HBCU-UP), "Strengthening Minority Access to Research and Training (SMART)" program and the well established Timbuktu Academy. LS-LAMP also collaborates with the Program to Increase the Pursuit of Education and Learning in Engineering and Science (PIPELINES) at Southern University and A&M College in collaboration with Iowa State University. Additionally, LS-LAMP has strong links with the many precollege summer middle and high school student SMET programs, as well as several bridge programs. Similar collaborations are taking place on LS-LAMP campuses around the state.

LS-LAMP also collaborates with the statewide DOE/EPSCoR HRD project to co-host an Annual Student Research Conference for the past three years. Lawrence Livermore National Laboratory (LLNL) donated \$10,000 to the 1999 EPSCoR/LAMP conference. LLNL has also agreed to co-sponsor the 4th Annual Research Conference along with the Louisiana Chemical Association (LCA). LS-LAMP has also partnered with Kaplan, one of the nation's leaders in standardized test preparation to provide customized hands-on GRE workshops during the 4th Annual DOE EPSCoR HRD and LS-LAMP Research Conference.

LS-LAMP created a national partnership through its MainSTey mathematics and science technology education collaboration with NSF, Texas Instruments, Inc., the Mathematical Association of American (MAA), the Louisiana Board of Regents, Southern University, and thirty-three (33) LSAMP institutions around the country. These institutions initiated mathematics and science teacher curriculum reform on their campuses to contribute to the pool of minority graduates with science and/or mathematics teaching credentials.

With the one-year funding by NSF to support teacher preparation in SMET disciplines, LS-LAMP strengthened its ties with the Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT) by expanding opportunities to additional minority science and math teacher education students under the nationally recognized LaCEPT model. LS-LAMP will expand its collaboration with precollege teacher enhancement programs (Louisiana Systemic Initiatives Program (LaSIP), Louisiana Rural Systemic Initiative, the NASA PACE project, and others). Further, LS-LAMP will increase the degree of leveraging these statewide activities to increase the pool of interested and academically prepared underrepresented minority students eligible for SMET graduate study.

Mid-South LSAMP

MAMP has implemented several programs within our Alliance to insure we are providing our students with the best education and training experiences they need to be successful in SMET careers. Among the programs we provide for our students, the Summer Research Internship Program has been of tremendous benefit and has been a positive force in influencing MAMP students to pursue graduate degrees after completing their undergraduate studies. MAMP works in concert with several companies, educational institutions and government agen-

cies to provide opportunities for faculty and students to participate in scholarly research. Under the Human Resource Development Continuum, MAMP students have participated in the summer research component of several NSF funded Minority Graduate Education (MGE) grants and several summer research programs at other LSAMP institutions which are not a part of our Alliance. Within our Alliance, MAMP institutions such as the University of Tennessee, Memphis, University of Memphis, Tennessee State University (TSU) and University of Arkansas, Pine Bluff (UAPB), Arkansas State University, LeMoyné-Owen College, Rust College and Christian Brothers University provide opportunities for both MAMP faculty and students to participate in research through several funded programs. The University of Tennessee, Memphis has established a summer research program especially for MAMP students, the UT Memphis MAMP Research Apprentice Program. Tennessee State University provides research opportunities through their Center for Research Excellence in Science and Technology (CREST).

Mississippi LSAMP

MLSAMP collaborates closely with each of the Human Resource Development Continuum programs within Mississippi. The project director, Dr. Richard H. Sullivan, is one of the principal investigators on the CREST program at JSU, the Computational Center for Molecular Structure and Interaction (CCMSI). He and some of the other PIs supervise the research of undergraduates in MLSAMP. The CCMSI is a nationally competitive research and educational program involving computational chemistry research groups at JSU and the University of California at Berkeley. MLSAMP was involved in the design of the MGE program, Access to Graduate Education in Mississippi (AGEM), directed by Dr. Maurice Eftink of Ole Miss. The strong collaborative network among the public universities, established and nurtured by MLSAMP, provides a natural feeder system for moving a pool of highly qualified baccalaureates into the graduate programs of the institutions. The Graduate Bridging Program of MLSAMP, the brainchild of Dr. George Adebisi of MSU, facilitated the evolution of AGEM. The HBCU-UP at JSU, Science and Technology Access to Research and Graduate Education (STARAGE) works in conjunction with MLSAMP to achieve enhanced educational efficiency in science, mathematics and engineering education. Many of its activities are enhanced versions of similar MLSAMP activities aimed at improving rates of recruiting, retaining and graduating minority students.

New Mexico LSAMP

New Mexico AMP's participation in HRD programs begins with the linkages to our two- and four-year partner institutions and collaboration with the Regional Alliance for Science, Engineering, and Mathematics (RASEM) for Students with Disabilities. Their cooperation and enthusiasm allows New Mexico AMP to provide additional opportunities for research and educational experiences for our students. One of the foundations of this effort is the AMP/WERC Annual Statewide Student Research Conference. To help broaden the scope of our HRD participation, the CETP/teacher preparation track was a major component of the 1999 conference with workshops facilitated by Dr. Larry Scadden of NSF; Dr. Rick Scott, Director, New Mexico CETP; and other local faculty. CETP and SMET students were invited to present their research in oral or poster format. Other HRD participation included the "LSAMP at the Smithsonian" project where two students interned in 1998, and

two attended the Winter Workshop in 1999.

New Mexico AMP continues its collaboration with the New Mexico Math, Engineering, Science Advancement, Inc. (New Mexico MESA), an exceptionally successful pre-college math and science program; and with the Utah, Colorado, Arizona, New Mexico Rural Systemic Initiative (UCAN-RSI) where representation on the UCAN-RSI Steering Committee ensures awareness of mutual goals and promotes awareness of opportunities for New Mexico youth.

Building on the existing network of professors and professional mentors within the New Mexico AMP infrastructure, we continue working to increase collaboration and develop new avenues of growth with programs such as the New Mexico Doctoral Loan Program, and the Alliances for Graduate Education and the Professoriate (AGEP) program. Continued involvement with New Mexico's two national laboratories and our doctoral degree granting university partners will also broaden the research and education opportunities which help to facilitate the success of students as they progress from the B.S. to the Ph.D. degree and into their professional careers.

New York City LSAMP

The LSAMP Continues to collaborate closely with Center for Analysis of Structures and Interfaces (CASI) and the Graduate School and University Center (GSUC) on summer activities, pre-collegiate initiatives and summer research, support of undergraduate and graduate fellows, and graduate recruiting efforts. The addition of the Alliance for Graduate Education and the Professoriate (AGEP) and continued collaborations with the Urban Systemic Initiative (USI) has produced a comprehensive pipeline of collaboration from pre-collegiate through the Professoriate level. Program activities include complementary recruiting efforts, membership on the LSAMP Steering Committees and Governing Board, conference planning and recruiting at the pre college and graduate level. Close collaboration with the USI and the LSAMP Teacher Preparation Program allows for first hand introduction of the 'inquiry based' approach to SMET education at the K-12 level. In addition, the collaboration facilitates the practical teaching experiences that is required of the LSAMP Scholars.

North Carolina LSAMP

Institutions within the North Carolina Louis Stokes Alliance for Minority Participation (NC-LSAMP) are collaborating with HBCU-UP, MGE, and CREST Programs to maximize resources and opportunities for students pursuing B.S., M.S., and Ph.D. degrees in science, mathematics, engineering, and technology (SMET) disciplines. When the Alliance was formed in 1992, several programs and activities were developed to facilitate a significant increase in the number of B.S. degrees earned by under-represented minority students in SMET fields. Major initiatives implemented include: supplemental instruction in gatekeeper courses, calculus reform using graphing calculators, general engineering freshman core program, bridge programs, SMET study groups, organized tutorial sessions, undergraduate research through faculty mentoring, and internships in industry and at national research laboratories. Subsequently, the CREST Center was established in 1997 at North Carolina A&T State University (NCA&TSU), in a ten-year partnership with North Carolina State University (NCSU). Outreach activities supported by the CREST Program at NCA&TSU, "Center for Advanced Materials and Smart Structures" (CAMSS), are geared to build upon and

enhance ongoing NC-LSAMP programs and services, particularly in research. CREST is coordinating efforts with NC-LSAMP to expand undergraduate summer research experiences, and provide research opportunities at collaborating industry and government facilities. An Undergraduate-Graduate Transition Program exposes rising seniors to current research issues being addressed by CREST. Moreover, collaboration between NC-LSAMP and CREST reinforces the relevancy of research and assists students in gaining valuable insights between engineering theory and practice. Additionally, CREST promotes excellent interaction between undergraduate and graduate students, other researchers, and local technical professionals for continuous upgrade of skills. These experiences are inspiring many students to make early decisions to pursue graduate study. More recently, NCA&TSU acquired funding for the HBCU-UP Program in spring 2000, which targets undergraduate students in physics, chemistry, biology, and mathematics at participating schools. Also, the MGE Program focusing on SMET Ph.D. production for the professoriate, was funded at the same time at two partner institutions: the University of North Carolina-Chapel Hill, and North Carolina State University. NCA&TSU is a partner with the NCSU MGE Program. The HBCU-UP and MGE Programs are building on established NC--LSAMP/CREST programs, activities, and services to implement a systemic, seamless approach. These efforts address undergraduate and graduate recruitment, best practices in teaching and learning strategies, mentoring, retention, and graduation of students with B.S., M.S., and Ph.D. degrees in SMET disciplines, including students who will enter the professoriate. Through pre-college programs offered across the Alliance, students receive early "hands-on" introduction to SMET opportunities and careers. To be sure, many of these students are entering the SMET pipeline in North Carolina, and collaborative efforts between LSAMP, HBCU-UP, MGE, and CREST are facilitating persistence and effective progression from the undergraduate to graduate level for increasing numbers of underrepresented minority students.

☞ Puerto Rico LSAMP ☞

PR-LSAMP is coordinated by the Resource Center for Science and Engineering of the University of Puerto Rico, which serves as the umbrella organization promoting the maximum collaboration of all institutions. With a vision of the educational system as a seamless K-16+ continuum, the Resource Center promotes the transfer of knowledge among education levels, thus fostering the coherence and high quality of SMET education in Puerto Rico.

PR-LSAMP concentrates on the undergraduate portion of the SMET pipeline, in articulation with other major NSF systemic programs that are addressing the pre-college and graduate segments of the pipeline. The Puerto Rico Statewide Systemic Initiative (PR-SSI) is implementing the K-12 science and mathematics reform. The Puerto Rico Collaborative for Excellence in Teacher Preparation (PR-CETP) is aligning teacher preparation programs with the standards-based reform spearheaded through PR-SSI. The Experimental Program to Stimulate Competitive Research (EPSCoR) is strengthening the Island's scientific research infrastructure and supporting the development of graduate programs in SMET, and the Minority Graduate Education (MGE) Program which promotes a more systemic, proactive and concerted institutional effort to recruit and retain students in graduate SMET programs.

These systemic programs together, all coordinated under the Resource Center, constitute an integrated systemic strategy to

enhance the production of SMET human resources to meet the demands of Puerto Rico's new economic development model.

☞ SUNY LSAMP ☞

SUNY LSAMP understands the need to combine a continuum of programs in order to help students complete their bachelor's degrees, go on to graduate study and enter the professoriate. Without a strong pipeline that reaches this end, there will not be the systemic change necessary to produce meaningful inclusion of all groups in our educational institutions. SUNY LSAMP has therefore put a strong emphasis on developing this pipeline through NSF HRD programs. In 1998-1999, a task force of SUNY LSAMP and SUNY graduate schools put together a proposal for MGE (now AGEP) funding. This alliance received AGEP funding in 1999, one of only eight programs nationally to receive this award. This new financial and programmatic alliance that already builds on the programs, personnel and students in SUNY LSAMP assures that there will be a tremendous increase in minority SEM doctorates and in students who enter the teaching profession. Included in this proposal are components that will build further on existing alliances already in place with several HBCUs.

☞ WAESO LSAMP ☞

Pre-College Section of the Pipeline

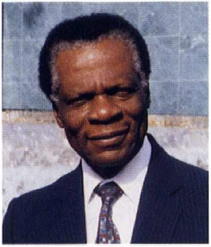
At the pre-collegiate level, we used **non-NSF funds** to serve a total of 10,066 7th through 12th grade students through Project PRIME (Project to Improve Minority Education). Our pre-college programs are achievement oriented, focusing on preparing minority and majority students for undergraduate majors in science and engineering fields. In addition, our summer bridge programs aid incoming freshman during the summer prior to their matriculation and which features academic work in such courses as Calculus, Biology, Physics, Inorganic/Organic Chemistry, and technical English, as well as college survival skills, motivational speakers, and the development of peer study/peer networking groups. The pre-collegiate programs have already been operating for seven years and are helping to bring thousands of additional minority students into higher education, many of them in science and engineering. For example, in Arizona we have changed the educational profile of minority students in the participating schools. One index of this higher level of achievement is the number of Arizona Advanced Placement tests in math and science which rose radically between 1987 (our baseline year) and 1995, both generally, and among minority students. In 1987, 2,266 students took the AP exam in Arizona. By 1995, that number had increased to 8,236, a full **263% increase**. Among underrepresented minority students, in 1987 only 206 students took the Arizona AP examinations in mathematics and sciences. In 1995, 1,157 took the exams, a full **462% increase**.

Graduate School Section of the Pipeline

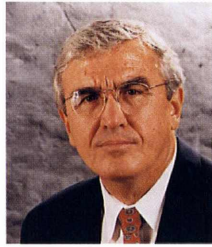
In the recruitment of minority graduate students our recently funded Minority Graduate Education program MGE@MSA, through WAESO's already existing graduate preparation and admissions component, almost exclusively funded by non-NSF (cost-share) funds, has developed a number of proven, successful project components for providing an optimal level of programmatic information and financial aid opportunities to the students; facilitating the graduate admissions process; and matching graduate students with programs.

LSAMP Award History

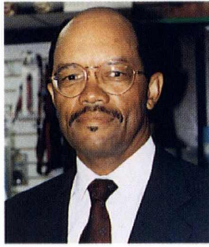
<u>Year</u>	<u>Alliance</u>	<u>Lead Institution</u>	<u>Project Director</u>
1991	Alabama California Mississippi Puerto Rico Western Alliance to Expand Student Opportunities Texas	The University of Alabama at Birmingham University of California, Irvine Jackson State University University of Puerto Rico Arizona State University Texas A&M University	Dr. Louis Dale Dr. Nicolaos Alexopoulos Dr. Richard Sullivan Dr. Manuel Gomez Dr. Antonio Garcia Dr. Karan L. Watson



Dr. Louis Dale



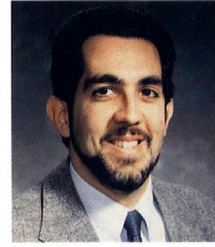
Dr. Nicolaos Alexopoulos



Dr. Richard Sullivan



Dr. Manuel Gomez



Dr. Antonio Garcia



Dr. Karan L. Watson

1992	Florida-Georgia New York City North Carolina South Carolina University of Texas System	Florida A&M University City College North Carolina A&T State University University of South Carolina The University of Texas at El Paso	Dr. Lynette Padmore Dr. Neville Parker Dr. Carolyn Meyers Dr. Angela Williams Dr. Pablo Arenaz
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Dr. Lynette Padmore



Dr. Neville Parker



Dr. Carolyn Meyers



Dr. Pablo Arenaz

1993	California State Chicago New Mexico Washington-Baltimore- Hampton Roads	California State University, Northridge Chicago State University New Mexico State University Howard University	Dr. Alfonso Ratcliffe Dr. Marian Wilson-Comer Dr. Ricardo Jacquez Dr. Clarence M. Lee
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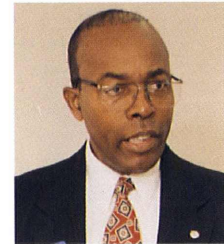
Dr. Alfonso Ratcliffe



Dr. Marian Wilson-Comer

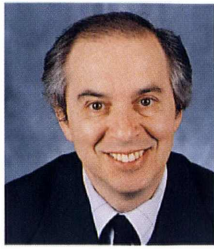


Dr. Ricardo Jacquez



Dr. Clarence M. Lee

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



Dr. Hanley Abramson



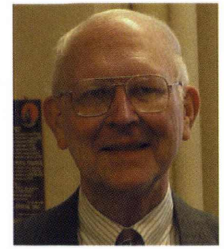
Dr. Joseph McDonald



Dr. Harold Deutschman

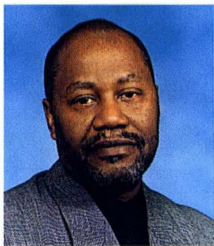


Dr. Earl Mitchell



Dr. Richard E. Woodring

1995	Louisiana Heartland's University System of Maryland Mid-South Xavier/UNCF	Southern University and A&M College University of Missouri-Baltimore University of Maryland Baltimore County LeMoyne-Owen College Xavier University of Louisiana	Dr. Robert Ford Dr. Charles Sampson Dr. Freeman Hrabowski Dr. Jesse F. McClure Dr. Leonard Price
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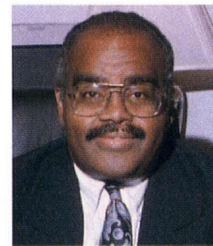
Dr. Robert Ford



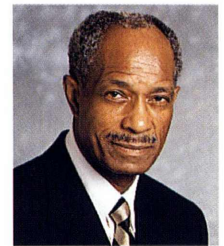
Dr. Charles Sampson



Dr. Freeman Hrabowski



Dr. Jesse F. McClure

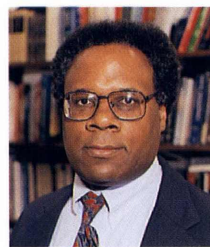


Dr. Leonard Price

1996	Colorado SUNY	Colorado State University State University of New York-Stony Brook	Dr. Omnia El-Hakim Dr. David Ferguson
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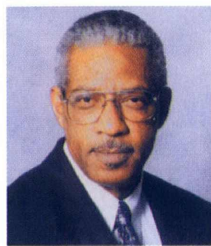


Dr. Omnia El-Hakim



Dr. David Ferguson

1997	Georgia	Clark Atlanta University	Dr. Thomas W. Cole, Jr.
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Dr. Thomas W. Cole, Jr.

1998	Houston	University of Houston	Dr. John Bear
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Louis Stokes Alliance for Minority Participation (LSAMP)

Underrepresentation of minorities among the science, mathematics, engineering and technology (SMET) fields is a long-standing problem. This untapped talent has serious consequences for the nation's ability to compete in the world economy driven by technological advances, as well as for a large segment of the nation's citizens who suffer loss of opportunity. As part of ongoing efforts to address this problem, NSF initiated in 1990 the LSAMP program to focus on increasing the quality and quantity of students receiving baccalaureate degrees in SMET disciplines. LSAMP puts particular emphasis on students from groups that are consistently underrepresented in these fields. The long-range goal of this program is to increase the number of students continuing on to graduate schools for a doctorate degree in one of the SMET fields and who then choose to take faculty positions on college and university campuses. This multidisciplinary undergraduate program works by supporting undergraduate systemic reform through alliances that include partners from both two- and four-year higher education institutions, businesses and

industries, national research laboratories, and local, state, and federal agencies.

Currently, 28 alliances, ranging from citywide (e.g., New York City, Detroit) to statewide (e.g., California, North Carolina) to multistate (e.g., Florida-Georgia), are supported by the LSAMP program.

One of the highly successful aspects of this program is faculty mentoring which pairs undergraduate students with a faculty member. This collaboration achieves a multiplier effect, resulting in personal and professional growth for undergraduates through research experiences including co-authoring scientific papers.

LSAMP also gives consideration to the critical transition points in SMET education such as high school-to-college, 2-year to 4-year college; undergraduate-to-graduate study; and graduate study-to-faculty career. Since NSF started the LSAMP, the number of B.S. degrees awarded to minority students has risen from under 4,000 in 1990 to over 20,000 in 1998 at participating institutions.

Photo courtesy of Marjorie DeMartino, University of California, Irvine

Photo courtesy of Dr. Angela Williams, University of South Carolina



Alabama Louis Stokes Alliance for Minority Participation

The University of Alabama at Birmingham
Alabama A&M University Miles College
Auburn University Stillman College
Alabama State University

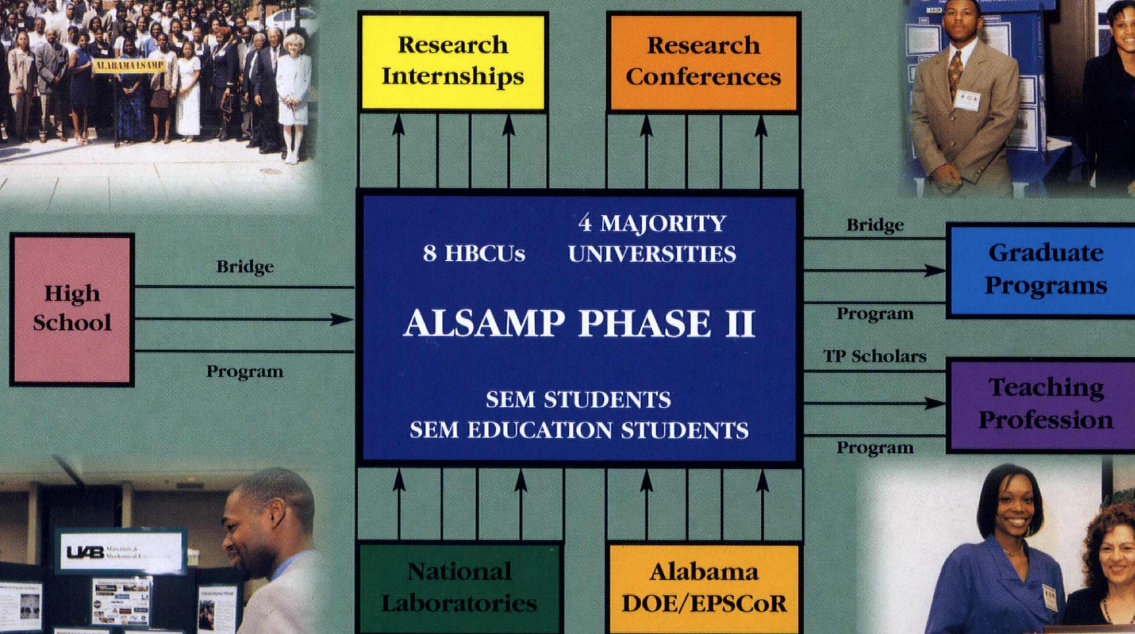


The University of Alabama in Huntsville
Tuskegee University Oakwood College
Talladega College Tougaloo College
The University of Alabama

***Increasing the Quantity and Quality of Minority Students
receiving degrees in science, engineering, mathematics, and science education***

The Alliance

The Alabama Louis Stokes 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's degrees in science, engineering, and mathematics in Alabama and parts of Mississippi. Today the Alliance membership includes all of the major colleges and universities in Alabama.



Alliance Programs

- Summer Bridge
- AMP Scholars
- Summer Research Internship
- AMP DOE/EPSCoR
- Graduate Bridge
- SEM Drop-In Center/Cooperative Learning
- AMP Summer Research Conference
- SEM Mentoring
- Teacher Preparation

Program Results

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999
B.S. Degree	437	613	603	668	757	882	939	953	979

SYNERGY

California LSAMP links with AGEP and CEA-CREST



Karla Muñoz, right, is featured in the Winter 2000 CAMP Quarterly. Photo by Cornell/Rockefeller/Sloan Kettering Tri-Institutional MD-PhD Program and Gateways to the Laboratory Program.

CAMP makes important connections to NSF Human Resource Development Programs: Alliances for Graduate Education and the Professoriate (formerly MGE) and the Cal State L.A. Center of Research Excellence in Science and Technology (CREST) are two key linkages. Programmatic relationships, particularly faculty collaboration, are expanded through this connectivity. Students benefit by further options to continue their post-baccalaureate education. In tandem, the programs cast a wider net to enrich minority student involvement in science and technology careers and professional aspirations.

The University of California graduate deans have established a systemwide coalition to draw minority talent into the professoriate. CAMP students who wish to become future faculty will be among the top recruits. The "portable post-doc" feature will enable participants to experience teaching at any of the UC campuses.

CEA-CREST and CAMP, through their respective lead institutions, Cal State L.A. and UC Irvine, have drafted a formal Memorandum of Understanding. The document will leverage the goals of both programs to support NSF goals, fellowships and graduate school preparation for the Ph.D.

Together, NSF-supported and affiliated diversity programs promise to offer the state and the nation a focused agent for human resource development.

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

1998-99 CAMP ACCOMPLISHMENTS:

Delivered: 177 student oral and poster presentations, supported by 61 staff and 299 ladder rank faculty, as well as 36 adjunct/lecturers and 22 researchers.

Supported: More than 200 research internships and 570 undergraduate trips to professional society meetings, strengthening readiness for graduate school and research careers.

Self-reported: Nearly 400 students have enrolled in top graduate and professional schools over life of program.

Partnership: The 1999 CAMP Statewide Undergraduate Research Symposium convened 100 UC faculty, students, and staff for a research-focused experience.

GP: NSF supplemental funding for Graduate Preparation, enabling GRE training through discipline-focused seminars and graduate admissions workshops, including writing the statement of purpose.

Synergy: Facilitated representation on the UC-AGEP Steering Committee to optimize program design and implementation.

Expansion: Collaborated with the UC Graduate Deans for UC LEADS, a new opportunity for graduate preparation.

Cohesion: Convened the regional directors and coordinators at UC Santa Barbara and UC Berkeley, as well as a program coordinators meeting at UC San Diego to implement graduate preparation.

Effectiveness: Best Practices at the eight UC partner campuses reflect key categories: curriculum reform, mentored laboratory research, transition to the university, institutionalization, professional development and research experiences in the National Labs.

Outreach: Extended opportunities to community college students through the UC Davis and UC Santa Cruz MESA summer programs, exposing students to university-level research and development in engineering.

Transfer readiness: Assisted with proposal for Santa Ana College transfer students in biological sciences for enhanced opportunities for research and transition to UC Irvine.

Advisory Board: Added representation from IBM, strengthening links to technology-based opportunities and access to Silicon Valley research and development for engineering and computer science students.

Administrative Center for CAMP is UC Irvine
Nicolaos Alexopoulos, *Dean, School of Engineering, P.I.*
Manuel N. Gómez, *Vice Chancellor, Statewide Director*
Marjorie DeMartino, *Associate Statewide Director*

e-mail: camp@uci.edu • www.camp.uci.edu
Phone: (949) 824-6578

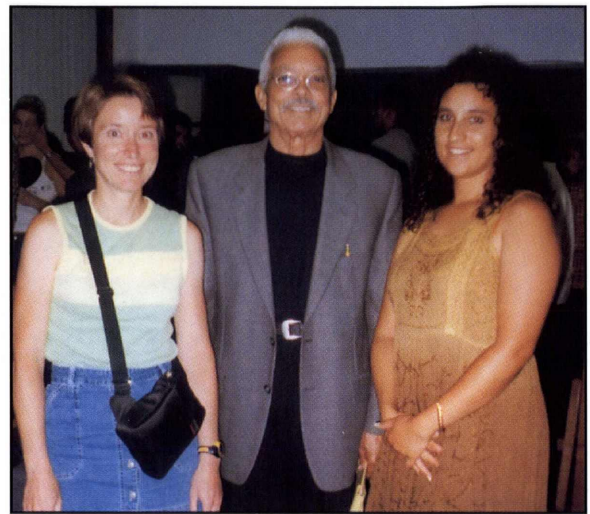


The California State University, a Louis Stokes Alliance for Minority Participation

The California State University Alliance is composed of twenty-two of its state campuses and 25 of the 107 California Community Colleges. It is now beginning the first year of its Phase II proposal.

The Phase II proposal incorporated the freshmen summer bridge of the Phase I AMP, but the new program placed greater emphasis on Academic Year workshops, especially for community colleges, and research opportunities and mentoring, especially for four year college students.

Phase I's summer bridge for freshmen demonstrated, once again, that such programs have a dramatic effect on first year retention. We added incentives for students who succeed in "gateway courses" as a result of participation in academic year excellence workshops. This applies to both CSU and Community College students in our program. Community College students are 50% of our students who eventually earn their SEM baccalaureates. Workshops in these introductory courses will be followed by workshops in more advanced courses and by internships or research assistantships for students with demonstrated potential for graduate study, while they are still junior or senior level undergraduates.



Our Summer workshops and our Academic Year workshops both stress collaborative study and academic excellence, but our summer courses are concentrated in a four week period, while our AY workshops are distributed uniformly over the 30-40 weeks of annual instruction and offer a greater opportunity to develop a sense of community as well as improved academic performance and retention.

Unfortunately, we cannot offer all students internship or research opportunities, but we offer all of them the information about their existence and the opportunity to compete for these openings through their academic achievement and their participation in all other aspects of AMP. We publicize all internship opportunities immediately and repetitively.



CSU-LSAMP ADMINISTRATION

Chair, Governing Board

Dr. Charles Reed, Chancellor / California State University

Principal Investigator

Dr. A. F. Ratcliffe, Dean Emeritus / CSU Northridge
College of Engineering & Computer Science

Acting Executive Director

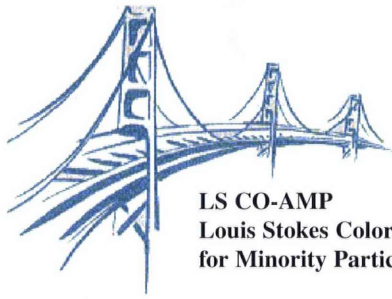
John Guarrera / CSU Northridge
College of Engineering & Computer Science

Associate Executive Director

Michelle Manchester / CSU Northridge
College of Engineering & Computer Science

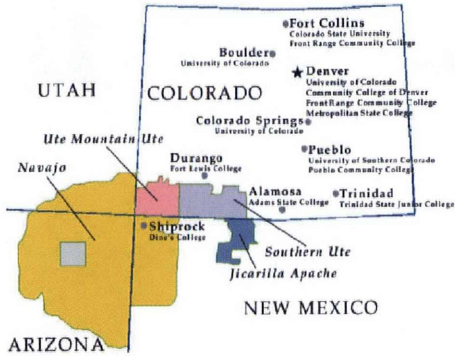
Fiscal Management

San Francisco State University



LS CO-AMP
Louis Stokes Colorado Alliance
for Minority Participation

Louis Stokes CO-AMP
Serving Colorado and the Four Corners Region



LS CO-AMP SERVES STUDENTS IN---

Colorado and the Four Corners Region. Our goal is to double the number of underrepresented Baccalaureate-degreed graduates in the Science, Mathematics, Engineering, and Technology disciplines by the year 2001. LS CO-AMP has eight baccalaureate degree-granting colleges and universities as partners, four community college partners, and Diné tribal college partner. LS CO-AMP is also proud to serve the Jicarilla Apache, Navajo, Southern Ute, and Ute Mountain Ute Native American Communities as we collaborate on ways to increase the numbers of American Indian students continuing on to obtain college degrees.

LS CO-AMP INSTITUTIONS---

- ◆ Adams State College
- ◆ Colorado State University
- ◆ Community College of Denver
- ◆ Diné College
- ◆ Fort Lewis College
- ◆ Front Range Community College
- ◆ Metropolitan State College of Denver
- ◆ Pueblo Community College
- ◆ Trinidad State Junior College
- ◆ University of Colorado - Boulder
- ◆ University of Colorado - Colorado Springs
- ◆ University of Colorado - Denver
- ◆ University of Southern Colorado



From Left: Director Dr. Omnia El-Hakim, LS CO-AMP PI/Director and Professor at CSU & FLC, Colorado Lt. Governor Joe Rogers, Ty Smith, LS CO-AMP Project Coordinator

LS CO-AMP'S FOCUS IN YEAR 4---

- ◆ Retention and recruitment programs for LS CO-AMP students.
- ◆ The implementation and continuation of Transfer Bridge Programs from community colleges to baccalaureate degree-granting colleges and universities.
- ◆ Increasing the institutionalization of LS CO-AMP activities at the participating colleges and universities.
- ◆ Increasing funding from corporate and government agency partners.
- ◆ Encouraging and motivating LS CO-AMP students to pursue Graduate Programs.
- ◆ Increasing faculty involvement in LS CO-AMP activities.
- ◆ Offering faculty development opportunities.
- ◆ Strengthening ties with Lt. Governor Joe Rogers and Colorado legislature.
- ◆ In partnership with American Indian Science and Engineering Society (AISES), Lucent Foundation, and Colorado Institute of Technology (CIT), implementation of a summer outreach program, "Math, Science, and Engineering Enrichment Program", targeting middle and high school students as well as Teacher Training Summer Enrichment Program in SMET disciplines.

LS CO-AMP KEY PERSONNEL

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GOVERNING BOARD CHAIR

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 President, Colorado State University
 Chancellor, Colorado State University Systems

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TRIBAL PARTNERS

Jicarilla Apache Tribe – Frieda Havens
Navajo Nation – Genevieve Jackson
Southern Ute Indian Tribe – Latitia Taylor
Ute Mountain Ute Tribe – Yolanda Rossi



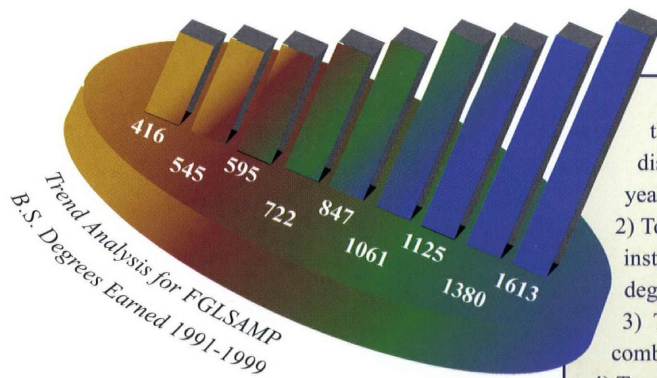
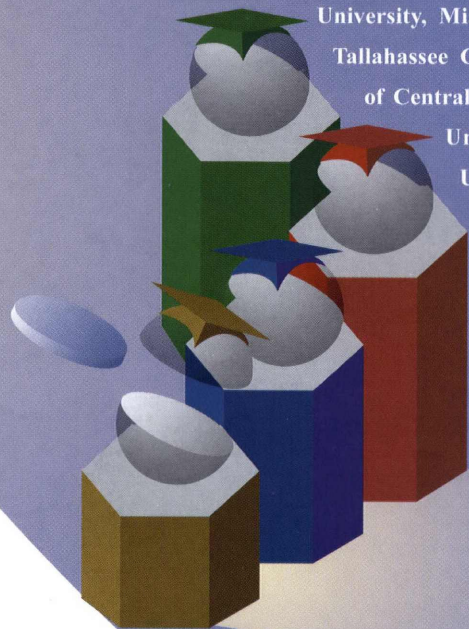
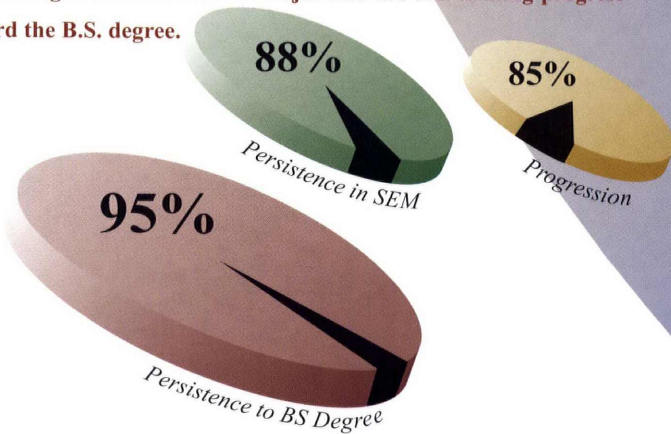
FLORIDA GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

OVERVIEW

The Florida-Georgia Louis Stokes Alliance for Minority Participation (FGLSAMP) project is a coalition of twelve academic institutions in Florida and one in Georgia. The ultimate goal of FGLSAMP is to increase production of underrepresented minority graduates in the areas of Science, Mathematics, Engineering, and Technology (SMET). The member institutions include: Albany State University, Bethune-Cookman College, Florida A&M University, Florida Community College @ Jacksonville, Florida Memorial College, Florida International University, Florida State University, Miami-Dade Community College, Tallahassee Community College, University of Central Florida, University of Florida, University of Miami, and University of South Florida.

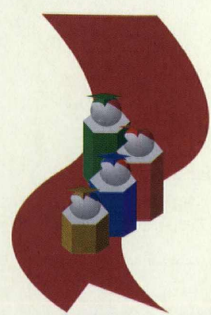
*Progression & Persistence

PROGRESSION: assessed for students making timely progress toward the B.S. degree in a declared major. **PERSISTENCE (in SMET):** assessed for students who may have changed SMET areas and are still making progress toward the B.S. degree. **PERSISTENCE (toward the B.S.):** assessed for students who may have changed to a non-SMET major and are still making progress toward the B.S. degree.



- 1) To recruit increased numbers of students to the SEM disciplines at the freshman and junior levels and graduate these students from the disciplines of their choice in 5 years (some engineering disciplines), 4 years or 2 years respectively;
- 2) To establish structured relationships with a significant number of graduate institutions for the purpose of facilitating the enrollment of SEM B.S. degree graduates in Ph.D. granting institutions;
- 3) To explore and plan for the establishment of several 5-year BS/MS combined degree programs at participating institutions;
- 4) To enhance the graduate school preparation of FGLSAMP participants through the provision of significant external research experiences;

- 5) To promote improved student academic performance through organized, well established working relationships among students and between students and faculty;
- 6) To provide for prospective matriculants a summer academic experience that will review and preview important mathematics and science concepts as a part of a plan to reduce high attrition in the freshman year;
- 7) To develop a critical mass of highly motivated minority students who, by their organized and serious approach to their work, will serve as positive role models for other students;
- 8) To enhance faculty teaching skills and improve student learning through faculty conferences and workshops; and
- 9) To motivate students to pursue academic degrees in SEM disciplines, through exposure at regional conferences and Career EXPOS.



GOALS

THE GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

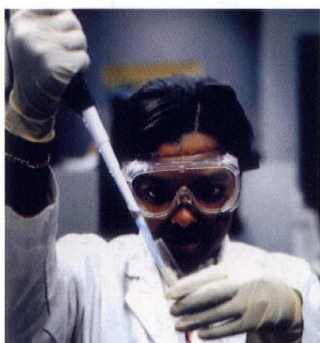
Clark Atlanta University • Atlanta Metropolitan College • Georgia State University
Morehouse College • Morris Brown College • Spelman College • Paine College



Dr. Thomas W. Cole, Jr.
Project Director

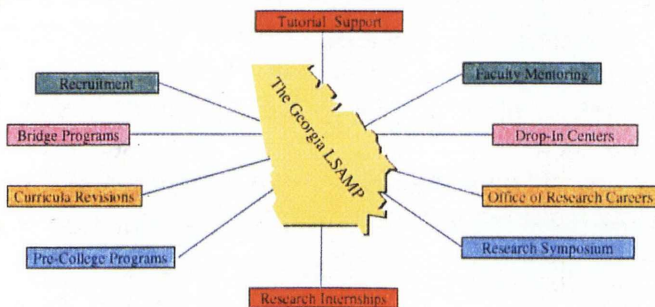


Recruiting, Retaining and Graduating Georgia Scientists for the 21st Century

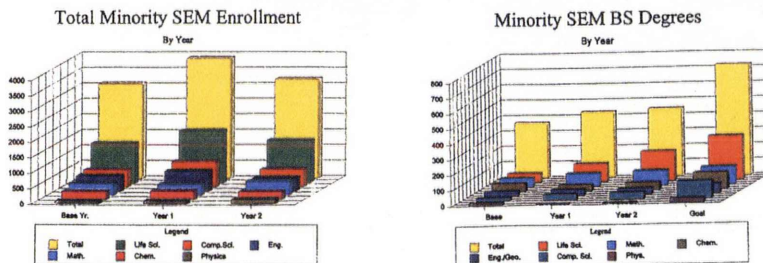


The Georgia Louis Stokes Alliance for Minority Participation was initiated during academic year 1997-1998 with six private Historically Black Colleges and Universities and a state-supported urban university. The overall goal of the Georgia LSAMP is to increase the quality and quantity of SEM degrees awarded to minority students who attend these institutions. Several cooperative affiliations have been formed to assist the Georgia LSAMP achieve its goal of integrating research and education. These affiliations include the Naval Research Laboratory in Washington DC and the Committee on Institutional Cooperation Summer Research Opportunity Program which includes the Big 10 institutions and the University of Chicago.

THE GEORGIA LSAMP PROGRAMS



PROGRAM RESULTS





THE HEARTLAND'S ALLIANCE FOR MINORITY PARTICIPATION

PROJECT DIRECTOR:

Charles Sampson,
Ph.D.

**INTERIM PROJECT
MANAGER:**

Robert L. Woods,
Ph.D. Candidate

**ADMINISTRATIVE
ASSISTANT:**

Lisa Larivee

PARTNERS:**PARTNER
INSTITUTIONS:**

Central Missouri State
University

Lincoln University

Metropolitan
Community Colleges
of Kansas City

St. Louis Community
College System

Southeast Missouri
State University

Southwest Missouri
State University

University of Missouri
– Columbia

University of Missouri
– Kansas City

University of Missouri
– Rolla

University of Missouri
– St. Louis

Heartland's AMP: Expanding the pipeline

HAMP institutions continue impressive gains in the number of minority undergraduate minority degrees produced in science, mathematics, engineering and technology areas. Last year alone, the Heartland's alliance institutions awarded 310 undergraduate degrees, a 72 percent increase above the 180 undergraduate degrees awarded in the previous year. First-tier graduate schools, government and private research organizations, and leading businesses in high-technology industries are actively recruiting these nationally competitive students for positions within their respective organizations. As HAMP students continue to assume positions within these organizations, they contribute to the pool of qualified individuals who will provide the nation's technological and research leadership at the dawn of a new millennium.

Each year the Heartland's AMP provides opportunities for students to hone their research skills by hosting the HAMP Research Symposium. For the past three years, the Heartland's AMP has empowered student researchers by conducting a statewide research symposium designed as a forum in which students can present research or other scholarly activity that they have been involved with under the supervision of faculty mentors. This activity allows students to gain exposure to the research process and gain valuable experience in making scholarly presentations. The symposium also provides an opportunity for students to network with representatives from academic institutions, state agencies, and HAMP industry partners.

Additionally, HAMP program administration has taken a leadership role in devel-

oping criteria for evaluating and identifying courses that present significant barriers for underrepresented students attempting to complete undergraduate degrees in the sciences, mathematics, engineering, and technology. At present, 52 "Killer courses" from freshmen to senior level at one HAMP institution have been identified. This year, the evaluation and identification template will be expanded to include all Heartland's AMP institutions. Concomitantly, specific interventions are being coordinated and developed to monitor and provide assistance to HAMP students who must enroll in these courses to satisfy curricula requirements. These activities are part of a comprehensive long-term strategy to assure continued increases in the percentage of HAMP students who successfully complete the most rigorous coursework within their respective disciplines.

BOARD OF GOVERNORS:

The HAMP Board of Governors serves in an advisory role to the program. Dr. Manuel T. Pacheco, University of Missouri System President, serves as Chair of the HAMP Board of Governors. Members include the Chief Executive Officers (CEO) of all HAMP partner institutions.

INFORMATION ABOUT ILLINOIS LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

The scope and variety of partnerships have increased dramatically over the funding period. Not only has there been an expansion of external cooperation but there has also been an increase in internal institutional cooperation. The Chicago LS-AMP has increased its institutional base from an urban metropolitan alliance to a statewide cooperative program. With the inclusion of institutions throughout the state of Illinois, a name change was appropriate. We are now the Illinois LS-AMP. Our primary partnerships include public and private universities, community colleges, public school systems, businesses, professional organizations, national laboratories and city/county/state and federal government agencies.

Participating institutions include: Chicago State University, DePaul University, Governors State University, Illinois Institute of Technology, Illinois State University, Northeastern Illinois University, University of Illinois at Chicago, Western Illinois University, Southern Illinois University, Olive-Harvey College, Kennedy-King College, Harold Washington College, Wilber Wright College, and Malcolm X College, South Suburban Community College, Truman College, Daley College, and St. Augustine College.

To address the issue of minority student transfer and articulation, the Illinois legislature provided funds to the Board of Higher Education to establish Minority Transfer Centers at community colleges. Transfer centers assist students in making the commitment to continue their education beyond the associate degree and prepare them to move to a four-year institution in an appropriate SMET discipline. Transfer Center directors work with the Illinois LS-AMP to establish programs designed to ensure smooth transition from the AA degree to the BS degree.

The academic scope of Illinois LS-AMP was increased with the inclusion of the Social and Behavioral Sciences and a Teacher Preparation supplements. These programs have paved the way for greater convergence of activity; opened the door of SMET education to previously untapped pools of students; and increased number of faculty, staff and administrators who are intimately involved and have a stake in the implementation of Illinois LS-AMP.

The Illinois LS-AMP umbrella has helped to solidify minority pipeline programs by providing infrastructure and talent, such as Illinois LS-AMP Scholars who serve as teaching assistants, research assistants and mentor to program participants. Program successes and visibility have helped the participating institutions attract funds from prominent foundations such as the Frankel, Toyota and Lucent Technologies foundations in support of academic year and summer programs aimed at motivating and

preparing high school students to enter SMET college degree programs.

Sara Lee Company, The New Explorers, state and national congressmen/city/county

and federal agencies have contributed to the success of the Illinois LS-AMP annual student research conference. These conferences provide the opportunity for faculty members, students, potential employers and graduate school representatives to come together in comradery to share results of research, compare notes, and relate experiences and to develop closer relationships.

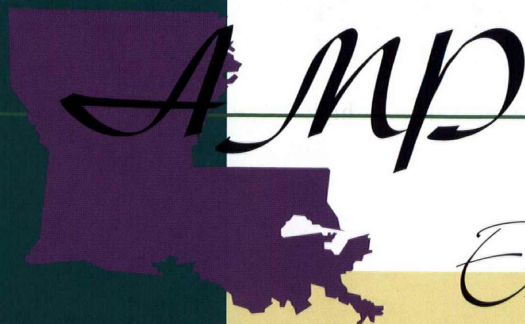
Illinois LS-AMP institutional SMET programs have been supported by the Illinois Board of Higher Education, National Aeronautics and Space Administration, Department of Education, National Institutes of Health, Department of Agriculture, Department of Defense, U.S. Air Force, Hewlett/Packart, the Chicago Botanic Garden, and various National Science Foundation programs.

Undergraduate research has been very important in encouraging minority undergraduates to pursue graduate studies. In addition to gaining research experience at the Illinois LS-AMP institutions, AMP Scholars have been placed at the University of Minnesota, University of Chicago, University of Iowa, University of Wisconsin, Loyola University, Northwestern University, Argonne National Laboratories, Abbott Laboratories, Lucent Industries, Standard Oil Company, and Metropolitan Information Center.

Student organizations are actively involved in recruiting and introducing minority transfer students to their campus. The African-American Academic Network, Latin American Recruitment and Education Services, Biological Society, and the National Association for the Advancement of Black Chemical Engineers are among the student organizations taking part in Illinois LS-AMP activities.

Other cooperative activities include 1) reciprocal library privileges provided to community colleges with predominantly minority enrollment in order to encourage these students to become more familiar with the bachelor degree granting institutions and 2) cooperative relationships which permit students and faculty to take advantage of the educational resources at the Grant Park Conservatory, Chicago Botanical Garden, the Field Museum of Natural History and other resources.





EXCELLENCE IN EDUCATION, MENTORING AND RESEARCH



LS-LAMP Institutions

- Southern University and A&M College
-
- Dillard University
-
- Grambling State University
-
- Louisiana State University
-
- Louisiana Universities Marine Consortium
-
- McNeese State University
-
- Nunez Community College
-
- Southern University New Orleans
-
- Southern University Shreveport Bossier City
-
- Tulane University
-
- University of New Orleans
-
- University of Southwestern Louisiana

LS-LAMP Project Principals

- Dr. Robert L. Ford
Project Director
-
- Dr. Diola Bagayoko
Campus Coordination Director
-
- Dr. Kerry Davidson
Co-Principal Investigator

Management Staff

- Luria Shaw
Interim Program Administrator
-
- Evaluation Coordinator
-
- Dawn D. Stephens
Outreach Coordinator
-
- Karen E. Page
Research Associate

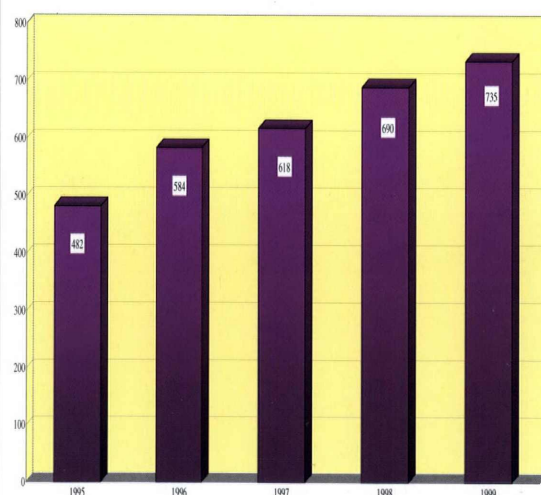
For more information on LS-LAMP visit the LS-LAMP web site at <http://www.ls-lamp.org>



The Louis Stokes Louisiana Alliance for Minority Participation (LS-LAMP) continues to be one of the foremost contributors to minority SMET education in Louisiana and the region. LS-LAMP is a comprehensive statewide coordinated program aimed at substantially increasing the number and quality of underrepresented minorities enrolling in and completing baccalaureate degrees in science, mathematics, engineering, and technology disciplines. The Louisiana Alliance is composed of 11 institutions and one research facility.

LS-LAMP began in 1995 with a five-year objective of doubling, by the end of 2000, the number of minority SMET students receiving BS degrees from partner institutions and sending at least 20% of these graduates to enroll and succeed in SMET graduate school programs in Louisiana and elsewhere. During the 1997/98 academic year LS-LAMP exceeded its numerical objective of sending at least 20% of its graduates to SMET graduate school programs. Out of 690 graduates in 1997/98, 152 are pursuing graduate degrees in SMET (i.e. 22%). By the end of the five-year period of Phase I, LS-LAMP proposes not only to maintain the gains of Phase I but also to increase the number of high quality SMET BS degree production to 1,250 at a minimum, by 2005, while institutionalizing its entire operation.

LAMP SMET Degrees Awarded 1995 (Baseline) to 1999



Source: Louisiana Board of Regents

LS-LAMP has launched many successful efforts in its first phase. Below is a list of some of LS-LAMP's accomplishments in Phase I.

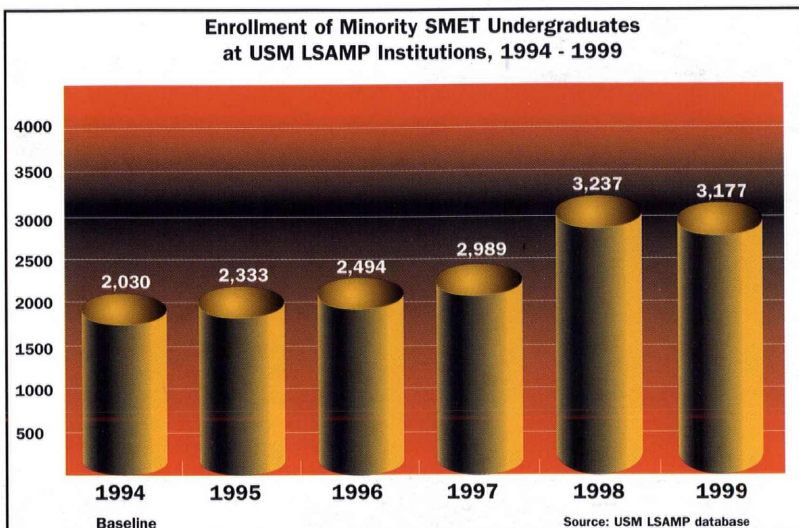
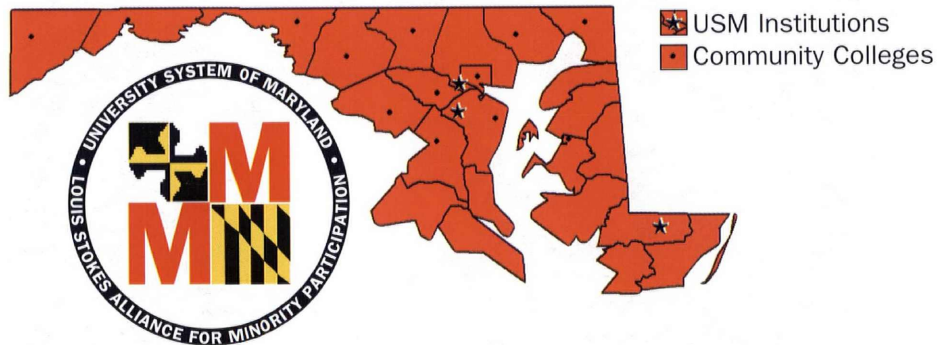
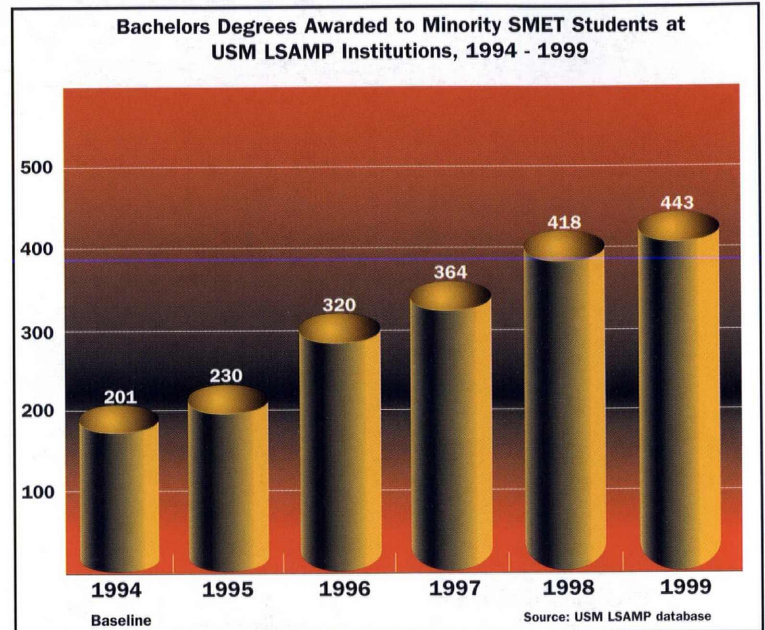
- Awarded over 1,000 scholarships to minority SMET scholars
- Hosts annual student research conference with DOE EPSCoR HRD program
- Effects on-going changes in campus cultures, value systems, and incentive structures to ones that recognize mentoring as the coupling between quality instruction and learning and quality instruction and research
- Adopted, adapted, and instituted systemic mentoring models on its participating campuses
- Established effective collaborations with other systemic programs such as the Experimental Program to Stimulate Competitive Research (EPSCoR), Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT), the HBCU-UP program at Southern University, Strengthening Minority Access to Research and Training (SMART) and with business and industry

UNIVERSITY SYSTEM OF MARYLAND LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION

USM LSAMP is a comprehensive program that is designed to extend and increase the impact of current initiatives to increase substantially the quantity and quality of minority and other students receiving baccalaureate degrees in science, mathematics, engineering and technology (SMET).

USM LSAMP scholars have mentors who are professional SMET role models. Mentors come from a variety of settings, including universities, private laboratories, government facilities, and corporations. Mentors assist scholars with educational and career issues, as well as topics ranging from class scheduling, internship experiences, graduate school selections, and career choices. Informal aspects of the mentoring relationship include discussions of personal concerns and participation in social and recreational activities. The mentoring component facilitates educational and professional growth before and after completion of the baccalaureate degree.

USM LSAMP partner institutions include the University of Maryland, Baltimore County (lead institution), the University of Maryland, College Park, the University of Maryland, Eastern Shore, and 16 public community colleges in Maryland.

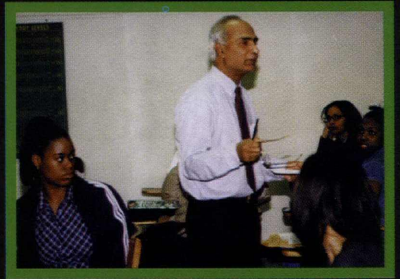


During the first four years, 1,544 minority SMET students were awarded bachelors degrees, and at the end of the 1998-1999 academic year, minority SMET degree production increased to 120 percent over the 1994 baseline.

Minority SMET enrollment rose to 3,177 for the 1999 fall semester, an increase of 57 percent over the 1994 baseline.

One key element of the **USM LSAMP** Program is the ongoing review and revision of the curricula for "filter" SMET courses.

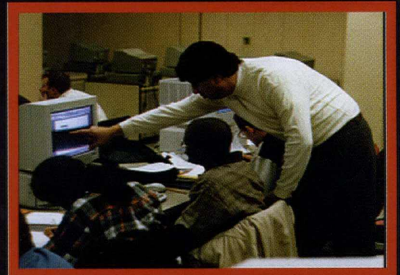
Preparing Our Youth Today Through ...



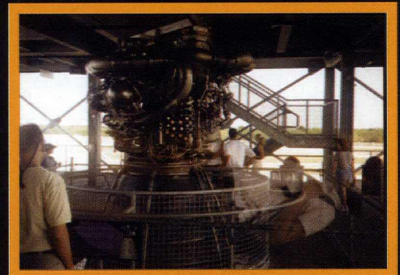
Mentoring



Research



Academics



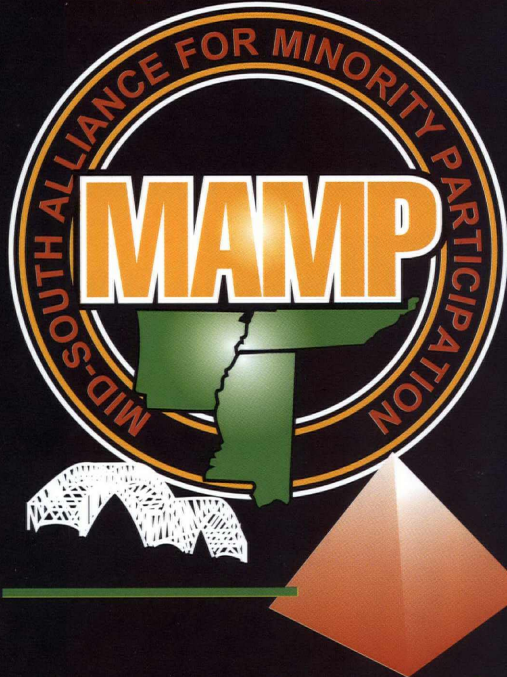
Internships



Summer Bridge

LEMOYNE-OWEN COLLEGE • UNIVERSITY OF TENNESSEE, MEMPHIS •

National Science Foundation
Louis Stokes



Developing Future Leaders
in
Science, Mathematics, Engineering,
and Technology

STATE TECHNICAL INSTITUTE AT MEMPHIS • TENNESSEE STATE UNIVERSITY • ARKANSAS STATE UNIVERSITY • CHRISTIAN BROTHERS UNIVERSITY • UNIVERSITY OF MEMPHIS
MID-SOUTH COMMUNITY COLLEGE • SHELBY STATE COMMUNITY COLLEGE • RUST COLLEGE

For Brighter Futures Tomorrow

Mississippi Louis Stokes Alliance for Minority Participation



MLSAMP is a statewide alliance of 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. The alliance has facilitated a doubling of the number of minority students earning degrees in science, mathematics, engineering and technology since 1991 in Mississippi universities.

• Scholarships: MLSAMP scholars at each institution are partially supported by performance-based scholarships. They 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.

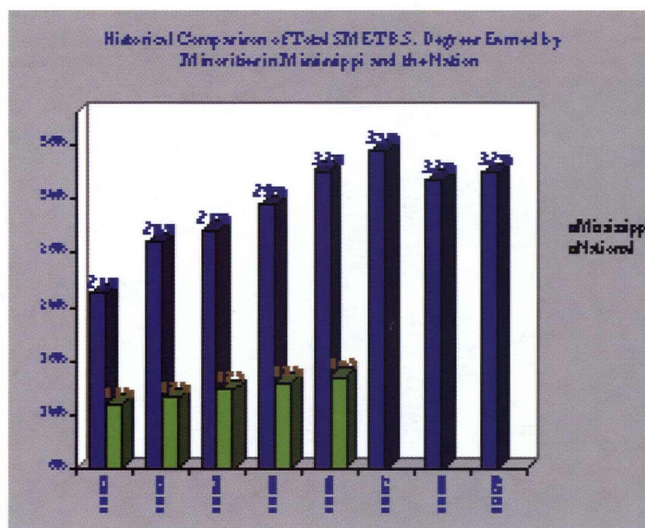
• Undergraduate Research Experiences: IMAGE Scholars are encouraged to link with a faculty member in his/her discipline to develop research skills during the academic year. These research experiences are facilitated by linking with other sponsored programs on each campus such as EPSCoR. Student research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

• Business/Industry/Government Linkage: MLSAMP 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 MLSAMP students after completion of the freshman year.

• 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 PRAXIS are conducted to assist students with reaching their goals of high achievement. Mentoring workshops help students focus early on plans for graduate study. Annual statewide retreats bring MLSAMP students and faculty from all eight institutions together for networking, and to review and revise, as necessary, MLSAMP-sponsored activities.



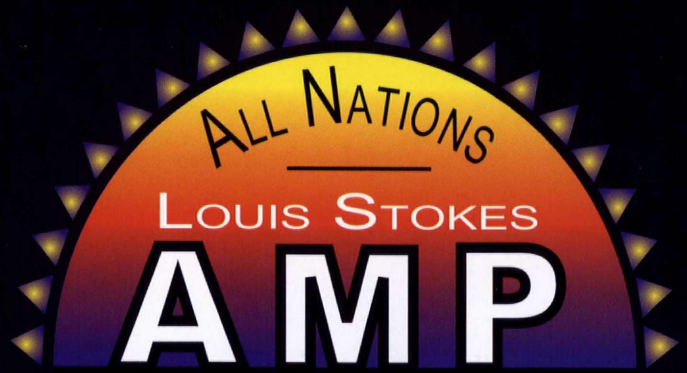
• Curriculum Reform: MLSAMP's goal is to disseminate information across universities and across campuses about what is going on in SMET curriculum reform; and to stimulate plans for future action. The most successful curriculum reform activities to date have focused on the use of technology, cooperative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

• New Initiatives: Teacher education and the social science disciplines have been integrated into the MLSAMP structure, making a strong addition to the interdisciplinary framework from which MLSAMP addresses pipeline issues. Linkage with the NSF-funded Delta Rural Systemic Initiative addresses pre-college pipeline issues in the region.

• Bridge to Graduate School: Assists increasing numbers of MLSAMP students who are enrolling in graduate school. Statewide retreats for rising juniors and seniors focus on preparation and expectations for graduate study.

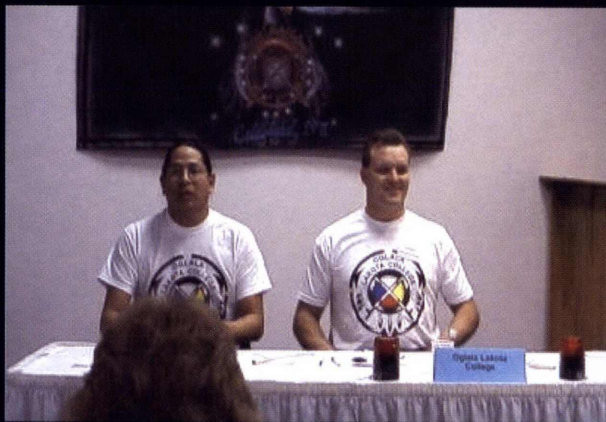
All Nations LSAMP Program Highlights

Student focused activities, such as the Scientific Poster and Oral Presentations and the Science Bowl Competitions for Tribal College Students are some of the key activities leading to the All Nations LSAMP's success.

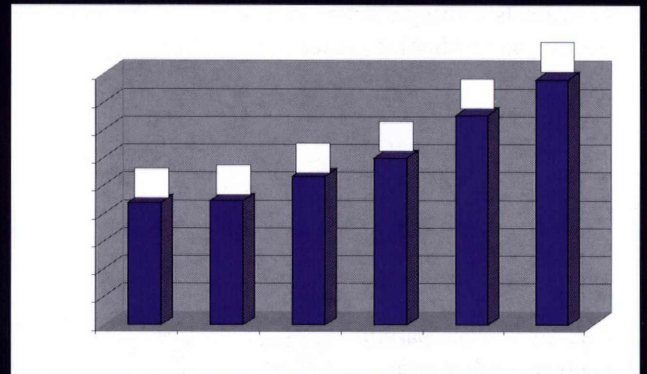


ALLIANCE FOR MINORITY PARTICIPATION

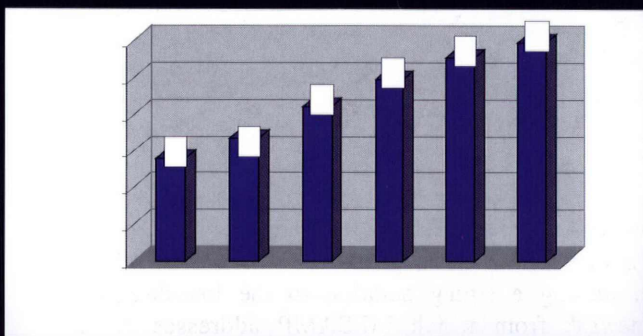
All Minority SMET Bachelor's Degree Production & Goal



Oglala Lakota College Team: Champions of the ANLSAMP Science Bowl at the AHIEC 2000 Conference



American Indian SMET Bachelor's Degree Production & Goal



All Nations LSAMP students Vanessa Sosa and Adea Green, first and second place winners in the Scientific Oral Presentations at AIHEC 2000

Tribal College Partners

- | | |
|--|-------------------------------------|
| Bay Mills Community College | Leech Lake Community College |
| Blackfeet Community College | Little Big Horn College |
| Cankdeska Cikana Community College | Nebraska Indian College |
| Cheyenne River Community College | Northwest Indian College |
| College of the Menominee Nation | Oglala Lakota College |
| Dull Knife Memorial College | Salish Kootenai College |
| Fond du Lac Community College | Sinte Gleska University |
| Fort Belknap College | Sisseton Wahpeton Community College |
| Fort Berthold Community College | Sitting Bull College |
| Fort Peck Community College | Stone Child College |
| Haskell Indian Nations University | Turtle Mountain Community College |
| Lac Courte Oreilles Ojibwa Community College | United Tribes Technical College |

University Partners

- | | |
|---|-----------------------------------|
| Black Hills State University | University of Kansas |
| Central Michigan University | University of Minnesota - Duluth |
| Lake Superior State University | University of Montana |
| Montana State University - Bozeman | University of North Dakota |
| North Dakota State University | University of South Dakota |
| Rocky Mountain College | University of Washington |
| South Dakota School of Mines & Technology | University of Wisconsin - Madison |
| South Dakota State University | Washington State University |
| | Western Washington University |

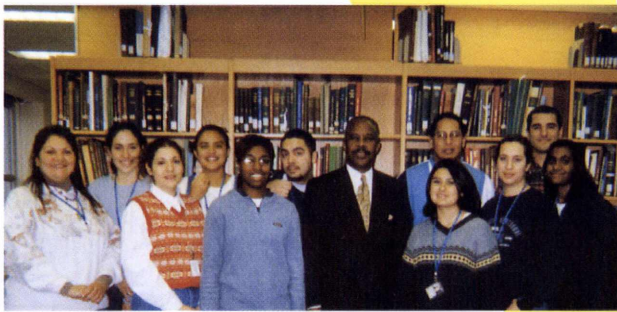
NEW MEXICO AMP



**LOS ALAMOS NATIONAL
LABORATORY TRANSFER
RESEARCH PROJECT**



**1999 ANNUAL STATEWIDE STUDENT
RESEARCH CONFERENCE**

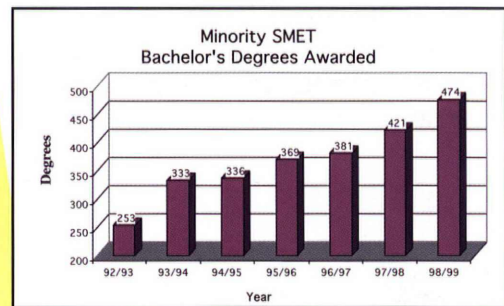
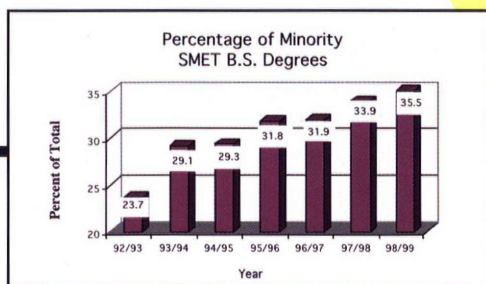


**NETWORKING & PROFESSIONAL
DEVELOPMENT**



**UNDERGRADUATE RESEARCH
ASSISTANTSHIPS**

Student Success



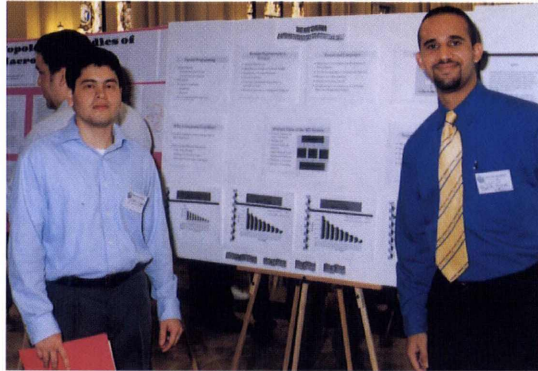
Dr. Ricardo B. Jacquez, Director; New Mexico Alliance for Minority Participation; MSC-3AMP;
New Mexico State University; P.O. Box 30001; Las Cruces, NM 88003-8001
Phone: 505/646-1847 Fax: 505/646-2960 e-mail: amp@nmsu.edu <http://www.nmsu.edu/~nmamp>



NEW YORK CITY LOUIS STOKES ALLIANCE

ALLIANCE FOR MINORITY PARTICIPATION IN SCIENCE, ENGINEERING AND MATHEMATICS

The New York City Louis Stokes Alliance has created a powerful model of SMET educational reform at CUNY, one of the nation's largest Urban Universities. To promote the recruitment, performance, and retention of minority students in SMET disciplines and dramatically increase the number of SMET bachelor's degrees awarded by the university, NYC LSAMP has:



"During 1998-1999 year, we continued to expand the NYC Louis Stokes Alliance core of research assistants, positioning the City University of New York to play a role in the national need to increase the participation of underrepresented minority students in the Science, Mathematics, Engineering and Technology enterprise. Our second Urban University Conference honored the LSAMP faculty mentors that have opened their laboratories to LSAMP participants. The expansion to 142 mentors CUNY wide and the institutionalization of 165 research assistant fellowships is a measure of the commitment of CUNY to the LSAMP program mandates. We have created the "atmospherics" for student success by seeking to maintain and expand the nurturing environment in CUNY via the mentors, peer tutors, learning centers, and the overall program management structure. The base of a predominantly minority public school system, 99,000 minority students enrolled in CUNY, and the LSAMP presence at 16 units of the University and the Graduate Center will allow us to continue the expansion of opportunities for student success at an increased pace. Continuing to increase the flow from community college to senior college continues to be of paramount importance to the Alliance. By overlaying the pre-college, undergraduate, graduate, post doctoral and professorial components, the LSAMP is positioned to make permanent changes, and significant contributions to the national need to produce more scientists and engineers from the populations that have been traditionally underrepresented in these areas."

- Established **CAMPUS LEARNING CENTERS** administered by activity coordinators, who are CUNY SMET graduate students, and staffed by peer tutors;
- Brought about **COURSE RESTRUCTURING** which introduces collaborative learning workshops into SMET teaching and places heavy emphasis on faculty and peer **MENTORING**;
- Created an **UNDERGRADUATE RESEARCH PROGRAM** which engages community and senior college students in faculty research. The program has been expanded to include pre college and graduate student;
- Promoted **COOPERATION BETWEEN COMMUNITY AND SENIOR COLLEGES** by instigating articulation agreements and by establishing RIP/RAP (Research Initiation Program/Research Articulation Program) which creates research partnerships between community and senior college faculty;



- Developed the **LSAMP TEACHER PREPARATION INITIATIVE** that now has 18 LSAMP participants;
- Formed **PARTNERSHIPS WITH GOVERNMENT AGENCIES AND OTHER FUNDED PROGRAMS** such as NASA's Goddard Institute for Space Studies, Brookhaven National Laboratory, and the Urban Systemic Initiative;

TWO -YEAR COLLEGES

BOROUGH OF MANHATTAN•BRONX•HOSTOS•KINGSBOROUGH•LAGUARDIA•QUEENSBOROUGH

FOUR -YEAR COLLEGES

BARUCH•BROOKLYN•CITY•COLLEGE OF STATEN ISLAND•HUNTER•LEHMAN•MEDGAR EVERSO

NEW YORK CITY TECHNICAL•QUEENS•YORK

THE CUNY GRADUATE SCHOOL AND UNIVERSITY CENTER

Dr. Neville A. Parker, NYC AMP
Principal Investigator

NC-LSAMP, a partnership of eight institutions within the University of North Carolina system, is now engaged in Phase II of its operation. The chief aim of the Alliance is to substantially increase the number of underrepresented minority students earning B.S. degrees, and subsequently pursuing M.S. and Ph.D. degrees in science, mathematics, engineering, and technology (SMET) disciplines. By systematically enhancing recruitment, retention, access, and opportunities to education, internships, and research in these fields, the Alliance is achieving this goal. Since the inception of NC-LSAMP in 1992, combined efforts of partner institutions have resulted in a variety of programs and activities geared towards enhancing overall student success. Major initiatives include supplemental instruction, bridge programs, undergraduate research, and internships. In addition, an annual research conference sponsored by the Alliance showcases faculty-mentored research projects completed by students. During the 1998-1999 academic year, 5,096 underrepresented minority students enrolled in SMET disciplines were supported by NC-LSAMP institutions. Moreover, 825 B.S. degrees were awarded to African American (726), Hispanic American (48), and Native American (51) students in SMET fields.

**Targeted programs, activities,
and services include:**

- Supplemental Instruction and Tutorial Services in “gatekeeper” courses
- Distance Learning
- Hands-on Instructional Activities
- Collaborative Learning
- General Engineering Freshmen Core Program
- Peer Study Groups
- Summer Research Program
- Faculty and Peer Mentoring Programs
- Summer Bridge Program
- Industry and National Research Laboratory Internships
- Career Advisement
- Scholarship Program



Fayetteville 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-Pembroke, Winston-Salem State University,
North Carolina A&T State University (lead campus)

*For additional information contact: NC-LSAMP Central Office, College of Engineering, 640 McNair Hall
North Carolina A&T State University, Greensboro, North Carolina 27411
Phone: (336) 334-7447 - Fax: (336) 334-7540 - E-mail: vivian@ncat.edu*



Oklahoma Louis Stokes Alliance for Minority Participation

Partner Institutions: Cameron University, East Central University, Langston University, Northwestern Oklahoma State University, **Oklahoma State University (Lead Institution)**, Southeastern Oklahoma State University, Southwestern Oklahoma State University, University of Central Oklahoma, University of Oklahoma, University of Tulsa

Phase II Goals (1999-2004)

The Oklahoma Alliance, comprised of ten Partner and 19 Affiliate institutions, successfully completed Phase I of its program in October 1999 and has launched Phase II with additional Partners and expanded goals. The addition of three Partner institutions is a significant milestone that broadens the pool of available targeted students. Overall objectives are: extend the Research experience throughout the academic year; increase the number of scholars participating in summer internships; and implement Transfer Bridge Programs with 2-year Affiliate institutions. A Teacher Preparation component is being initiated to help prepare scholars for college-level faculty positions.

OK-LSAMP and EPSCoRE Unite Efforts

Last Spring, OK-LSAMP joined with EPSCoRE (Experimental Program to Stimulate Competitive Research) in hosting the first Science Workshop for Minority High School Students. OK-LSAMP was instrumental in recruiting the 70 participating high school sophomores

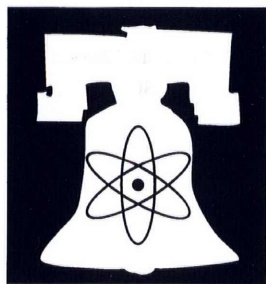
and juniors from Kansas, South Dakota, Nebraska, and Oklahoma. The 2-day workshop included science and math application modules and a college fair.

Student Participation in Conferences and Symposia

During the past year, more than 35 Scholars from Partner and Affiliate institutions made presentations at local, state, regional, and national meetings, including:

- The American Water Resources Association
- Oklahoma Academy of Science
- Regional Research Day,
- American Chemical Society Pentasection Meeting,
- International Symposium on Capillary Chromatography and Electrophoresis,
- Oklahoma Louis Stokes Annual Summer Symposium.
- Annual Joint Meeting of Beta Kappa Chi Scientific Honor Society, National Institute of Science, and Brookhaven
- Semester Program
- Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
- American Indian Science and Engineering National Conference
- Annual Conference for the National Society of Black Engineers





PhiladelphiaAMP

Greater Philadelphia Region Louis Stokes Alliance for Minority Participation

Phase I Accomplishments

1. Institutional Reorganization

- **Temple University** has formed a new College of Science, Engineering and Technology that combines (1) the Science, Mathematics, and Computer Science departments from the College of Arts and Sciences, (2) the Statistics department from the Business School and (3) the College of Engineering. The intent is to improve SEM education, particularly at the undergraduate level, and to integrate undergraduate education with graduate education and research.

2. Learning Environment Enhancements

Facility Enhancement

- Delaware State University constructed a new \$13 million science center complex.
- The New Jersey Institute of Technology (NJIT) has upgraded its computing facilities and physically centralized all student support services, modeled after University of Delaware.

Curriculum Reorganization

- **Lincoln University** has modified its Biology curriculum to ensure that students have research experiences as part of their academic training. In addition, the faculty approved the establishment of a Master's degree program in Mathematics in 1997.

Teaching and Course Modifications

- The Alliance has benefited from the efforts of **Community College of Philadelphia (CCP)** 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.

Undergraduate Research

- University of Delaware, one of ten institutions nation-wide to receive a three-year \$500,000 Recognition Award for the Integration of Research and Education (RAIRE) in 1997, has developed an outstanding program under which faculty accept undergraduates as their assistants or junior members of their research teams.

3. Alliance Partnerships

Articulation Agreements

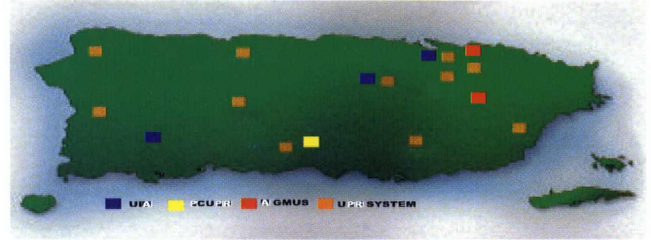
- The **Cheyney University** and **Temple University** physics departments are developing a joint B.S.-Ph.D. program.
- **Community College of Philadelphia (CCP)** and **Drexel University** have formalized a dual-admissions program, the Blue-Gold Connection (BGC). This program allows students to receive both an Associate's degree from CCP and a Bachelor's degree from Drexel and offers students, while still at CCP, full access to Drexel's academic and support resources. In addition, students receive from Drexel tuition grants equivalent to their CCP tuition.

4. Ph.D. Production

- University of Pennsylvania awarded 8 African-Americans and 6 Hispanics Ph.D. engineering degrees between 1994-1997.

Increasing the Effectiveness and Efficiency of Undergraduate SMET Education

PR-LSAMP is an alliance of the major public and private universities in Puerto Rico. Thirteen institutions, which represent 80% of the Island's undergraduate SMET population, are committed to achieving a true systemic reform by transforming their institutional teaching and learning culture. This change in institutional culture has created a more nurturing environment for students and has increased the effectiveness and efficiency of the science, mathematics, engineering and technology programs.



As a result, SMET undergraduate enrollment has almost doubled, from 12,527 in 1991 to 24,997 in 1998, and baccalaureate degrees in SMET disciplines have increased by 63%, from 1,709 to 2,789.



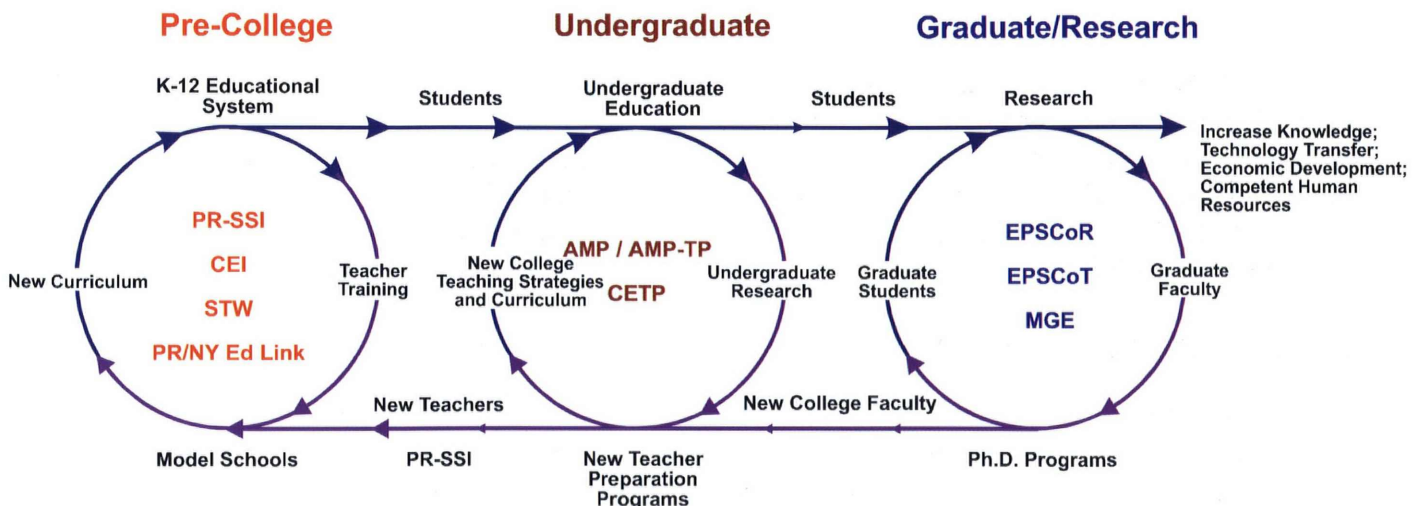
The core of PR-LSAMP is the curriculum revision of traditionally difficult SMET courses and the use of teaching strategies that have proven effective in improving academic performance, such as cooperative learning, use of technology, and the development of study/learning skills within the context of the course.



Other activities to retain and motivate students to stay in SMET careers are faculty and peer mentoring, research experiences, travel to scientific meetings, and stipends for low income students. As of 1999, PR-LSAMP has awarded over 1,195 research stipends, 1,521 awards to low-income students, and more than 8,000 students have benefited from mentoring activities.

The Resource Center for Science and Engineering of the University of Puerto Rico serves as the umbrella organization for the Alliance, promoting the maximum collaboration of all institutions. With a vision of the educational system as a seamless K-16+ continuum, the Resource Center promotes the transfer of knowledge among education levels, thus fostering the coherence and high quality of SMET education in Puerto Rico.

The Educational Pipeline for Nurturing of a New Generation of Scientists and Engineers



AMIP

South Carolina
Alliance For
Minority
Participation

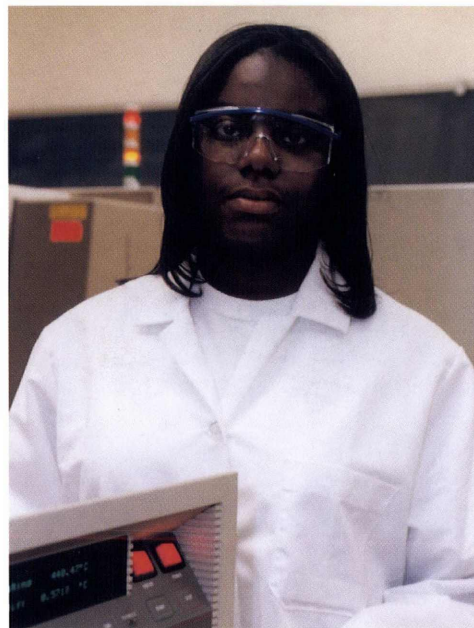


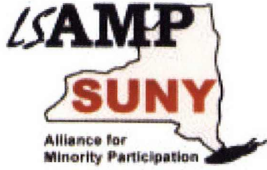
Benedict College
Claflin College
College of Charleston
Clemson University
Midlands Technical College
South Carolina State University
University of South Carolina
Voorhees College

THE SOUTH CAROLINA ALLIANCE FOR MINORITY PARTICIPATION (SCAMP) program introduces minority students to science, engineering and mathematics (SEM). SCAMP increases your chances for success by preparing you for what to expect in these career fields and sharpening your academic skills.

This innovative and structured program is funded by the National Science Foundation, the State of South Carolina and partner institutions. SCAMP offers various academic programs and workshops including:

- **Scholarships and Scholars Programs**
- **Directed Research and Internships**
- **Scientific & Engineering Freshmen Seminars**
- **Academic Workshops**
- **Summer Bridge Programs**
- **Graduate School Preparation Workshops**
- **Supplemental Instruction**
- **Math Excellence Workshops**
- **Peer Mentoring Programs**





*State University of New York
Louis Stokes Alliance for Minority Participation
Access and Excellence in Science, Mathematics,
Engineering and Technology*

David Ferguson, Project Director 631-632-9987 dferguson@notes.cc.sunysb.edu
 Lucy Gluck, System Coordinator 631-632-9988 lgluck@notes.cc.sunysb.edu
 Web Site – www.cc.sunysb.edu/sunyampRED/AMPHome.html

PARTICIPATING INSTITUTIONS
Binghamton Region

University at Binghamton
Broome Community College
Tompkins Cortland Community College
Onondaga Community College

Buffalo Region

University at Buffalo
Buffalo State College

Hudson Valley Region

State College at New Paltz
University at Albany
Ulster County Community College
Dutchess Community College
Orange County Community College
Schenectady Community College

Long Island Region

SUNY at Farmingdale
Nassau Community College
State College at Old Westbury
University at Stony Brook
Suffolk Community College

SUNY LS AMP's Trajectory



Undergraduate to the Professoriate

SUNY LS AMP	AMP Supplemental Grant	SUNY Alliance for Graduate Education and the Professoriate	Minority Professoriate Initiative
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Undergraduate SEM Enrollment

Baseline 1221	Current 2387	Goal! 2557
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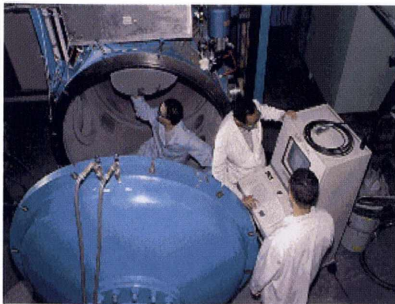
Undergraduate SEM Bachelor Degree Production

Baseline 222	Current 293	Goal! 440
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Accomplishments

- An overall increase in degree production of **33% from baseline**
- An increase of minority SMET enrollment of **95% from baseline**
- Strong institutional commitment to SUNY LS AMP as seen in cost share, which is **345% of funding amount**.
- Funding of the **SUNY MGE proposal** in which SUNY LS AMP is a key player and major partner.
- Activities to increase students who go on to graduate study and the professorate through an **AMP supplement grant, Minority Professoriate Initiative and Post-Doctoral Minority Fellowships**.





The Texas A&M System Alliance for Minority Participation

Building Partnerships Today to Create The Leaders of Tomorrow

Texas AMP Activities

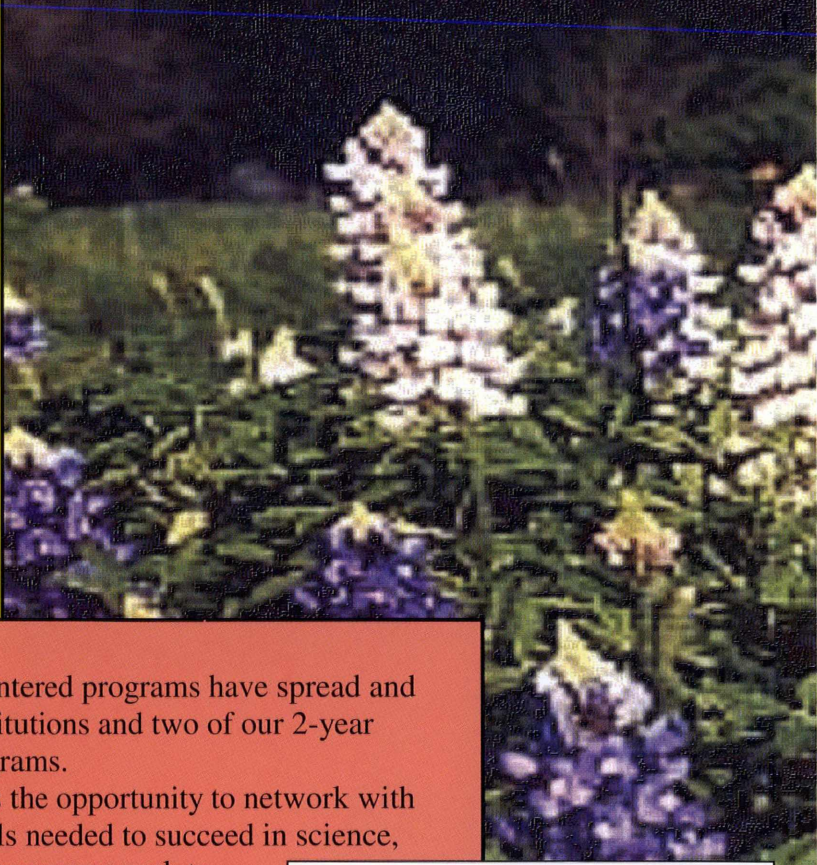
During Phase II, Texas AMP refocused on developing and implementing stronger partnerships between feeder and receiver colleges and universities and on developing and refining peer programs for students. One example of developments toward the first objective is the Transfer Jump Start program.

Transfer Jump Start Program

The Jump Start program was designed specifically for students planning to transfer to Engineering degrees at Texas A&M University. The program benefits transfer students by offering them the opportunity to take Foundations of Engineering I and II in the summer. Through the Jump Start program, these students are able start the fall semester taking the regular set of Sophomore or Junior level courses offered in their degree programs. AMP community college students are provided with summer scholarships and stipends.

Building Linkages

- HBCU** Prairie View A&M
- FIPSE** Fund for the Improvement of Post Secondary Education
- FC** Foundation Coalition: Working to bring ideas to alliance partners
- VITA** Virtual Institute of Transfer and Articulation

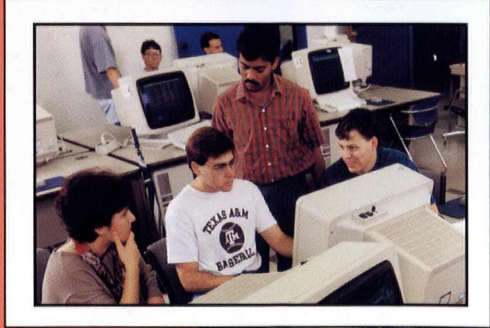


Peer Centered Programs

Within each of our partner institutions, peer centered programs have spread and grown in importance. All of our four-year institutions and two of our 2-year institutions currently utilize peer-centered programs.

Peer Mentorship Programs offer students the opportunity to network with one another, and to learn the necessary skills needed to succeed in science, math, engineering, and technology. These programs seek to mentor students to become better learners, to increase awareness and retention within SMET disciplines, and to encourage research and progression into graduate studies.

Peer Tutorial Support Programs hire students who have performed well in their degree to facilitate group study sessions. The objectives of this program are to provide tutorial support, provide student modeling of successful study techniques, and to encourage group study outside of scheduled sessions.



- College Station
 - Prairie View
 - Corpus Christi
 - International-Laredo
 - Blinn
 - Delmar
 - El Centro
- Houston
 - Laredo
 - Palo Alto
 - Richland
 - San Antonio

UT SYSTEM LSAMP

A Catalyst for Change



The University of Texas System Louis Stokes Alliance for Minority Participation, LSAMP, brings together the nine academic components of The University of Texas System and eleven regional community college districts in an effort to increase the number of underrepresented students enrolling in and graduating from baccalaureate programs in science, math, engineering and technology (SMET). At the same time, the Alliance commits itself to increasing the enrollment of underrepresented students in SMET graduate programs at UT System institutions.



Stephen Reyna (2nd from left) a, LSAMP Math tutor and UTSA Math Graduate student, works with San Antonio College students Ronald Fatalla, Fung Yukun and Randy McDonnell on a calculus problem at San Antonio College's LSAMP-sponsored Mathematics Lab.

Martha Navarro, UTEP LSAMP student, with her mentor, Dr. Jorge Lopez, and Nobel Prize Physicist, Dr. Douglas D. Osheroff, at the October 1999 SACNAS conference where Martha presented her prize-winning LSAMP research.

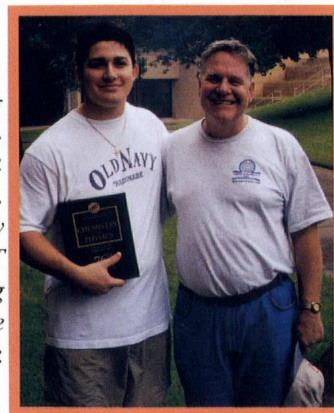


- UT Arlington
- Tarrant County College
- UT Austin
- Austin Community College
- UT Brownsville
- Texas Southmost College
- UT Dallas
- Collin County Community College District
- Dallas County Community College District
- UT El Paso
- El Paso Community College
- UT Pan American
- South Texas Community College
- UT Permian Basin
- Howard College
- Midland College
- Odessa College
- UT San Antonio
- Alamo Community College District
- UT Tyler



El Paso Community College LSAMP Representative, Emil Michal, talks with UTEP LSAMP 1999 Summer Bridge student, Jorge Melchor, Jr. and his mother, Sonia, at a reception hosted by UTEP President, Dr. Diana Natalicio welcoming the 1999 Summer Bridge students to UTEP.

UT Tyler LSAMP student, Edgar Cardenas, and his mentor, Dr. Donald McLaugherty, Chair of Chemistry, show off Edgar's award: UT Tyler's Outstanding Chemistry Student of the Year.





WESTERN ALLIANCE TO EXPAND STUDENT OPPORTUNITIES (WAESO)

<http://mati.eas.asu.edu:8421/%7Eampvi/waeso/>

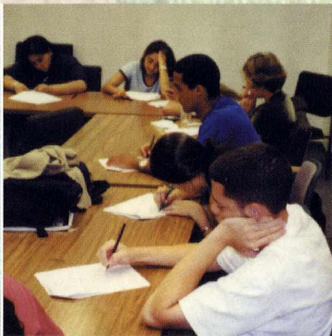
Our Louis Stoke AMP Program, The Western Alliance to Expand Student Opportunities (WAESO), is continuously increasing the quality and quantity of minority students receiving degrees in math, science and engineering throughout our region, which includes institutions in Arizona, Colorado, New Mexico, western Texas (El Paso Community College), Nevada, and Utah. The following are the activities in which our students actively participated:

- peer study groups (local and over the Internet)
- summer bridge programs
- faculty-directed undergraduate research projects
- graduate preparation institutes, mentorships, and research conference participation



NSF sponsored undergraduate component of the Western Alliance to Expand Student Opportunities

1999 Summer Bridge Program University of Colorado, Boulder



Students are taking their calculus final. Pictured from front to back are: Sterling Rowe, Rita Martinez, Reggie Gaylord, Carmen Kordick, Janessa Pedroza and Leigh-Ann Rocha



During the first day of the bridge program, Brian discusses with students and faculty the curriculum and expectations for the five-week program

1999 Quest Summer Bridge Program Weber State University

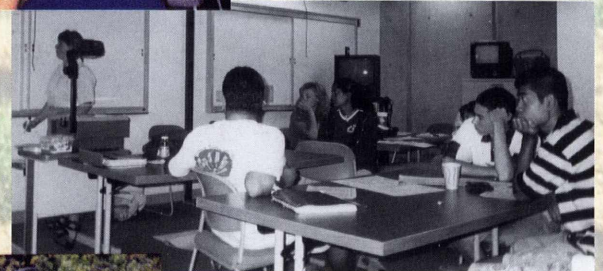
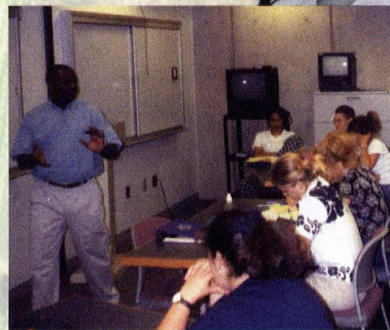
On the last day students were jubilant that they completed the demanding program, and could now enjoy summer vacation. In the picture front row: TeAnu Tonga, Elizabeth Ambrose, Yu Yamamoto, Stefanie Schulz (standing), Charles Salazar, Jr., second row: Valerie Gibson, Camille Hales, Jacquette Beard (Program Office Assistant), Brian Fella, Gregg Phillips, Nicholas Dixon, Jessica Ek, Chi Troung, and Freddie Cooper (Director). Back row: Brian Askew



Introduction to the University. This is a skills building class where students learn note taking, textbook reading, listening, test taking, writing, communication, and presentation skills. They also learn how to navigate the university system.

Pictured are: Michael White, instructor; front row: Valerie Gibson, Elizabeth Ambrose, Stefanie Schulz, Camille Hale, Brian Fella and TeAnu Tonga. Second row left to right: Brian Askew, Yu Yamamoto, Destini Segura and Trapper Geary

The mission of our Summer Bridge Programs is to facilitate the transition of incoming freshman and transfer students to college life. Students participate in an eight-week college summer program that consists of residential living and regular college courses in a variety of disciplines. In addition to academic course work, an integral component of the program includes seminars and workshops on career exploration, career assessment, college survival skills, diversity issues, cultural issues, leadership skills and health issues.



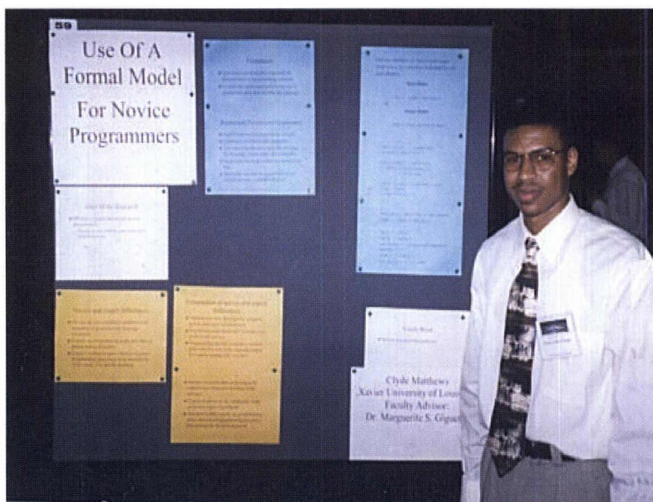
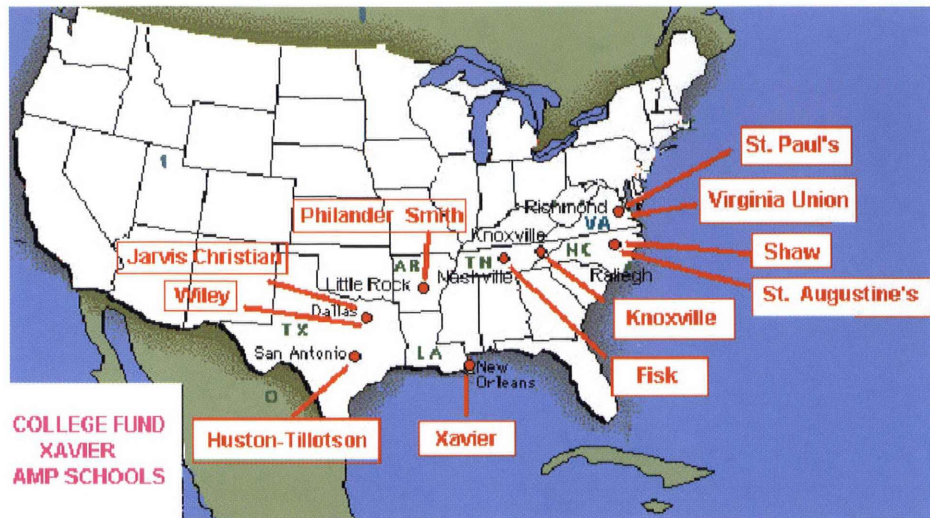
In this presentation, students discover their particular learning style preferences. They can use this information to become better learners. They also learn how to compensate when the instructor's learning style is different from their own. Lisa Moore, instructor; front table: Stefanie Schulz and TeAnu Tonga; back table: Charles Salazar, Jr., Yu Yamamoto, and Brian Fella.

The Leadership Retreat is an orientation program in which students become acquainted with each other and develop skills in team building, problem solving and leadership. Front row from left to right: Brian Fella, TeAnu Tonga, Elizabeth Ambrose, Destini Segura, Yu Yamamoto, and Charles Salazar, Jr. Second row left to right: Brian Askew, Camille Hales, Stefanie Schulz, Chi Troung, Valerie Gibson, Gregg Phillips (Program Advisor), Eiko Espiritu (Program Advisor), Nicholas Dixon and Freddie Cooper (Program Director).



COLLEGE FUND – XAVIER LSAMP

Committed to doubling the number of undergraduate degrees awarded in science, engineering, and mathematics through the replication and further development of successful strategies practiced at Xavier University of Louisiana and other schools in the Alliance.



LSAMP student Clyde Matthews at the National Committee for Undergraduate Research Conference.



Faculty and students at Committee for Undergraduate Research Conference.

1999 ACCOMPLISHMENTS

- **Realization of 347 SEM degrees awarded by the Alliance schools as of June 1999. This figure is 14.5% higher than the baseline level.**
- **Nine schools conducted bridge programs for 90 incoming LSAMP freshmen.**
- **Nine schools conducted research programs for 70 rising sophomores and juniors mentored by 26 faculty members.**
- **Continued implementation of strategies in teaching and research to enhance recruiting and retention of SEM students.**

The National Science Foundation

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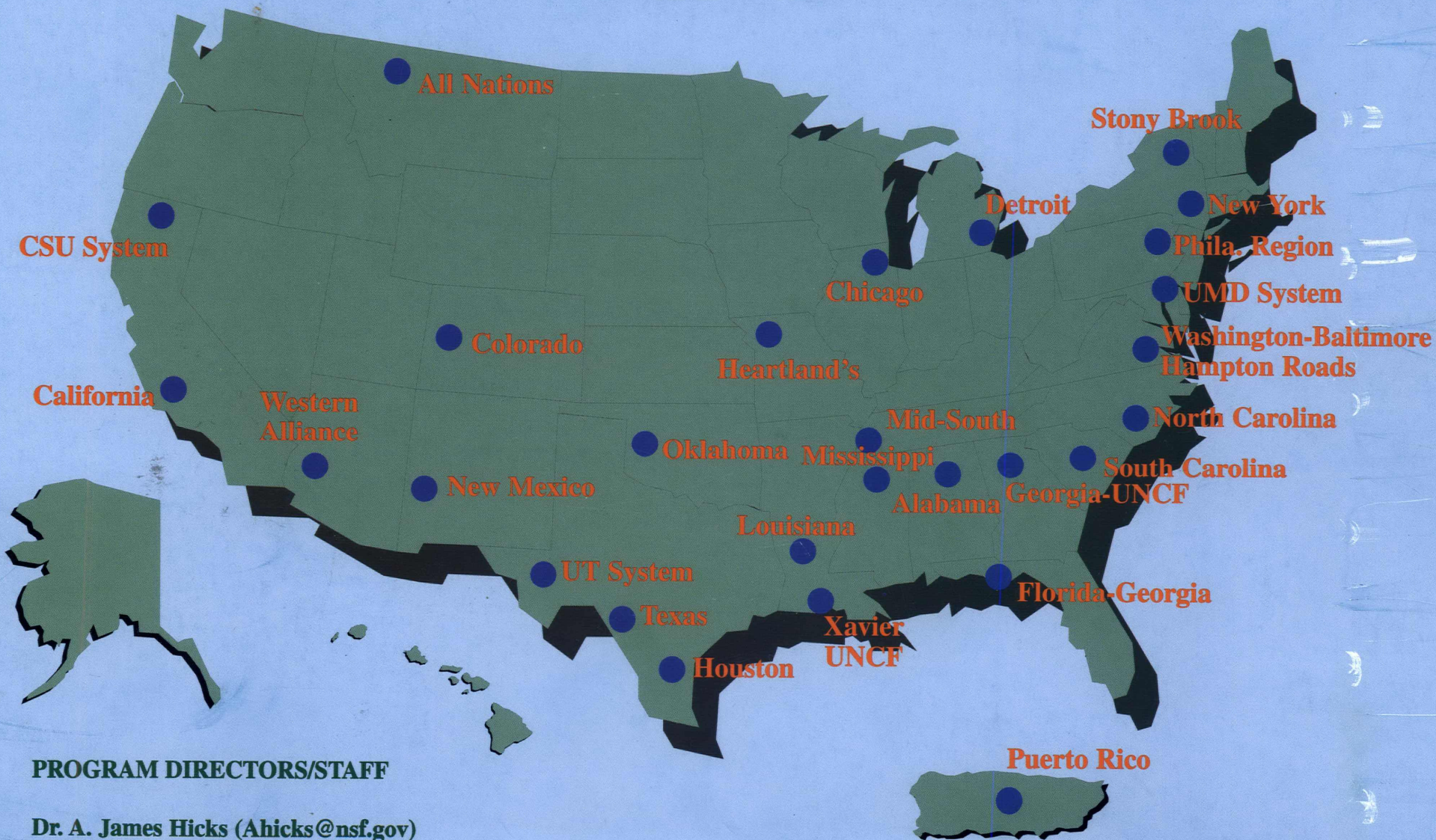
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