



# OKLAHOMA LOUIS STOKES AMP

Oklahoma Louis Stokes Alliance for Minority Participation in  
Science Mathematics Engineering Technology

2000 Report for  
Performance Effectiveness Review

to  
Division of Education and Human Resource Development  
Alliances for Minority Participation

at  
NATIONAL SCIENCE FOUNDATION  
ARLINGTON, VIRGINIA

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Oklahoma Alliance for Minority Participation  
"PROGRAM EFFECTIVENESS" REVIEWS (P.E.R.)

October 30, 2000

The National Science Foundation

4201 Wilson Blvd. ROOM 815

Arlington, VA 22230

## **PROGRAM PERFORMANCE**

### ***National***

In 1997, more than 10 million people in the United States held at least one degree in a science or engineering field, and at least 30% of that number were employed in science and engineering occupations. Traditionally, underrepresented minorities (African Americans, Hispanics, and Native Americans) have made up a small percentage of the science and engineering workforce. While these groups collectively comprised 24% of the US population in 1997, they made up only 7% of the total 1997 science and engineering workforce. As evidenced by the following data, this disparity is evident at all degree levels.

### **Employed US Scientists & Engineers by Highest Degree Attained (1997)**

<b><i>Ethnicity</i></b>	<b><i>Bachelor's</i></b>	<b><i>Master's</i></b>	<b><i>Doctorate</i></b>
White	5,833,700	1,369,800	532,000
Black	372,600	74,600	13,500
Hispanic	259,200	49,900	17,300
Asian	416,000	198,800	90,000
Other	26,000	4,900	2,100

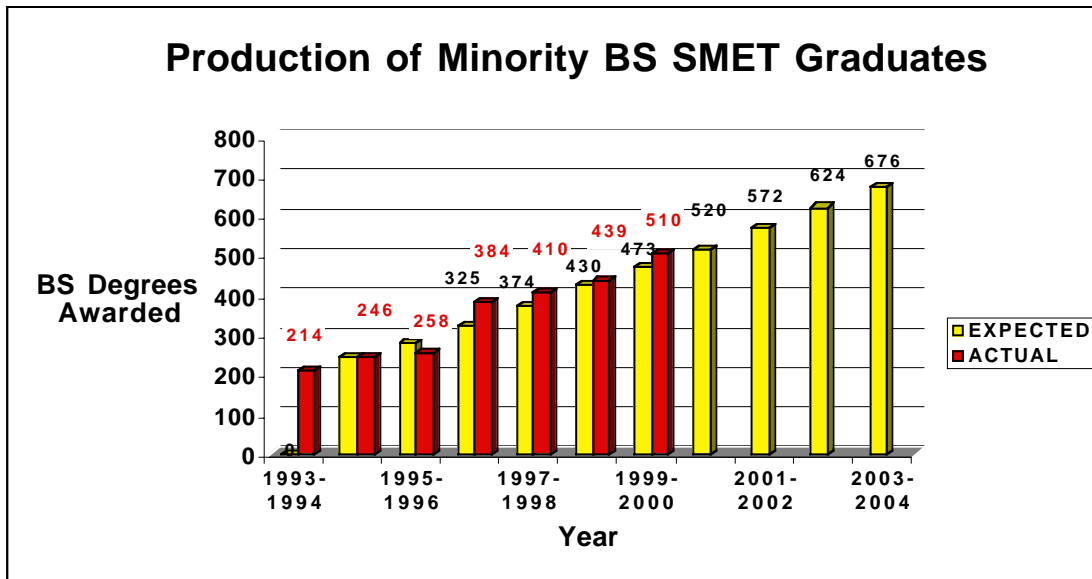
As shown in the above statistics, the baccalaureate degree is the highest attained by most scientists and engineers in the workforce, and underrepresented groups showed a steady increase in earning baccalaureate degrees between 1989 and 1996. Yet, concerns about ethnic disparity in the science and engineering workforce are by no means dispelled. The goals and objectives of AMP and other NSF-sponsored programs relate directly to this disparity.

According to Department of Labor statistics, the workforce will become increasingly diverse between 1998 and 2008. It is projected in NSF's *Science and Engineering Indicators 1998* that employment needs in science and engineering will increase by 44% or by 1.36 million jobs in the 1996-2006 decade. The employment outlook is compatible with NSF's GPRA Strategic Plan (2001-2006) that aims for a more diverse and competitive workforce of scientists and engineers.

### **LS-OKAMP**

**Phase II** of the LS-OKAMP program began in 1999 with a baseline graduation rate of 438 compared to the 1994 Phase I baseline of 214. Over the 5-year period from 1994 to 1999, baccalaureate degrees awarded to LS-OKAMP scholars increased by 51%. The noticeable growth in Phase I began with a 13% increase from the baseline in 1995; a modest 4.6% increase in 1996; and a remarkable surge of 43.6% in 1997. In the following years of 1998 and 1999, the projected growth patterns resumed with new SMET degrees exceeding the predicted increases by 36 and 8 degrees, respectively.

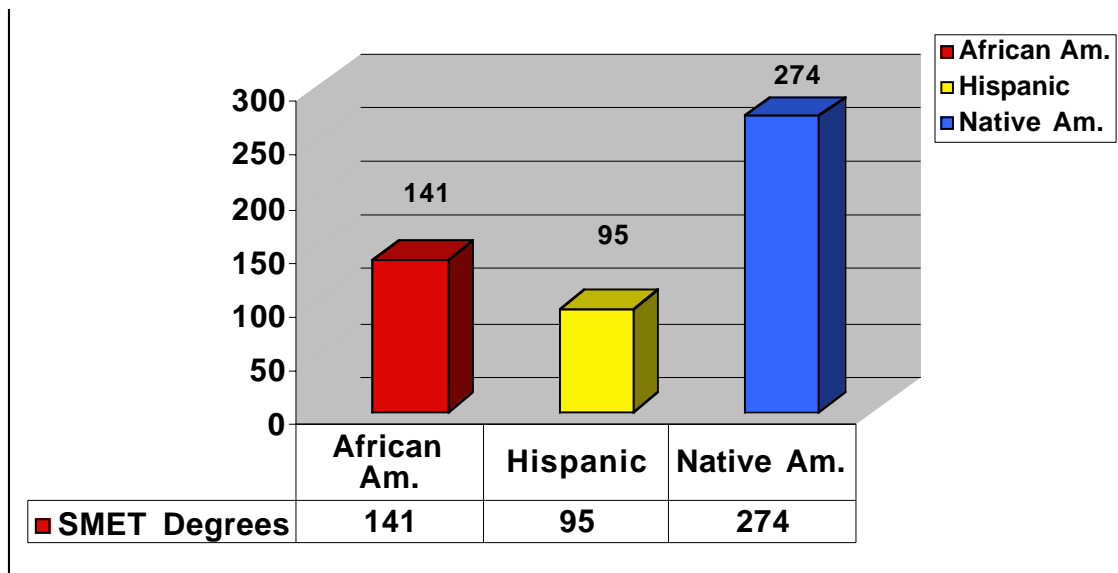
At the end of the first year of Phase II, LS-OKAMP participants (African Americans, Native Americans, and Hispanics) were awarded a total of 510 baccalaureate degrees in SMET fields . This number of degrees, which represents 18% of the total 2,819 SMET degrees awarded in Oklahoma in 1999-2000, exceeded the predicted increase by 38 degrees. In Phase II, LS-OKAMP aims to continue its annual increases in the attainment of baccalaureate degrees by minority students in SMET , and continue to motivate and prepare students for graduate school.



**Figure 2.** B.S Degree in SMET fields from the 1994 Base line of 214. The numbers do not include Pacific Islanders. This includes all Partner and Affiliate institutions that are participants in the Oklahoma Louis Stokes AMP program. The Base line for Phase II is 1999 total of 438.

**The distribution of the Minority Groups**

Most of the degrees awarded to underrepresented groups were in the areas of engineering and related technology, life sciences, and computer and information sciences, respectively. Native Americans earned 54% or 274 of the 510 SMET degrees awarded to minorities in all SMET disciplines in 1999, while African Americans and Hispanics earned 26% (or 141) and 18% (or 95), respectively. In fact, this trend among American Indian students has persisted since the 1997-98 academic year. **Oklahoma still produces a significant number of American Indians with BS degrees in SMET fields of study**



### ALLIANCE INVOLVEMENTS

The Oklahoma Alliance is involved with a number of institutions, agencies, and organizations that include the following:

- High Schools
- Community Colleges
- EPSCoR (Experimental Program to Stimulate Competitive Research)
- Graduate Colleges
- Associate Vice President for Multicultural Affairs Offices
- McNair Scholars Program
- Oak Ridge National Laboratory
- Major Corporations, including Texas Instruments, IBM, Lucent Technologies, 3M, Chevron, General Motors, Kerr-McGee, Halliburton, Exxon-Mobil, Phillips Petroleum, Southwestern Bell, Texaco, Conoco, and Dupont
- Bureau of Land Management (United States Department of the Interior)
- Federal Aviation Administration
- Cooperative Crystallography Research

### OTHER COLLABORATIONS

Through professional memberships, research presentations, program exhibits, and visitations, LS-OKAMP has collaboration to some extent with programs and agencies listed below:

- **Louisiana Alliance (LAMP) Annual Conference**  
 For the past two years, the Program Manager participated in LAMP's MainSTey Project that was implemented to initiate curriculum reform in mathematics and science. The Program Manager and the Campus Coordinator from the University of Central Oklahoma attended the 4<sup>th</sup> Annual DOE EPSCoR HRD & Louis Stokes LAMP Research Conference in Spring 2000, participated in a grants writing workshop, and explored opportunities for students with Exhibitors. The Program Manager was also a Judge for the High School SMET Fair.
- 2. **Colorado Alliance Conference (CO-AMP)**

Dr. Tim Patton, SEOSU Campus Coordinator, and OKAMP Scholar, Gerald Love, attended the CO-AMP meeting in July. Gerald made a presentation, participated in graduate school preparation workshops, and visited with graduate school representatives.

- **Collaboration with Other Western Alliances** in program assessment and future outlooks
- **Office of Grants and Contracts (Oklahoma State University)**  
LS-OKAMP personnel and financial officers from the respective Partner Institutions participated in a Cost Share Workshop
- **Multicultural Development and Assessment Center (Oklahoma State University)**  
Assists in identifying prospective OKAMP participants and present Survival Skills workshops
- **Corporate Exhibitors**  
At the Summer 2000 Research Symposium, the Bureau of Land Management, Conoco, Inc., and Phillips Petroleum set up exhibits and provided information on summer internships and employment opportunities
- **College Faculty**  
Faculty in SMET disciplines made presentations to small Cadre groups on academic success, research requirements, training, and expectations
- **Oklahoma Academy of Science**
- **OSU Office of Financial Aid**
- **Office of High School and College Relations**

## **MAJOR RESEARCH AND EDUCATION ACTIVITIES OF THE PROJECT**

### ***How has LS-OKAMP infused technology into the teaching-learning process?***

- Hands-on experience using computers and computer controlled laboratory equipment in SMET classes and research experiences
- Power Point presentations
- Regular e-mail communication and requirement for e-mail addresses
- Preparation of presentation posters
- Instructing high school-to-college bridge students in web publishing, preparation and use of spread sheet, and use of presentation software
- Installation of LINUX 6.1 operating systems and data analysis utilities on computers used in physics research; writing JAVA software and using an assortment of applications such as FLASH multimedia, DreamWeaver, Adobe PhotoShop, and FrontPage

## **'VALUE ADDED' FOR INTER- AND INTRA-INSTITUTIONAL PROGRAMMING AND COHERENCE**

Participants from each Alliance Partner Institution must take an active part in activities that enhance and assess academic performance, arouse accountability consciousness, and provide other experiences that lend to graduate school and workforce preparation. These activities include **Residential Summer Bridge Programs, Scholars' Programs (including Affiliate Scholars at 5 institutions), and Research Internship Programs.** Both High School and Transfer Bridge Programs are implemented with partnerships beings formed with high schools and community colleges.

***Inter- and Intra-Institutional programming and coherence have included:***

- Expanded high school/community college recruitment efforts that include reciprocal visits between campuses; follow-up telephone calls with students and parents; collaboration with SMET departments and non-academic support programs; mail-outs to schools, tribal headquarters and community organizations; one-on-one contacts
- Retention activities that include close academic monitoring, weekly Cadre' meetings for freshmen and sophomore scholars, meetings for all Scholars, peer networking, student/faculty interaction, tutoring, academic and personal counseling
- Involvement of other departments in LS-OKAMP programming such as the *Multicultural Development and Assessment Center; Reading, Writing, and Mathematics Resource Centers; Career Resource Center*
- Recent incorporation of *Ethics and Professional Behavior* component in one summer Bridge program with excellent potential for adoption by other Partner institutions
- Increased number of seminars that bridge both academic and non-academic areas, such as *goal-setting, how-to/what not to do, civic responsibility (voter registration), financial aid*
- Educational outreaches (visitations to local corporations)
- Increased participation in professional societies at local, regional, and national levels for purposes of presentation experience, leadership development, and networking
- Monthly academic status reports that facilitate academic monitoring
- Open-door policy with students
- Graduate School preparation activities
- Summer internship opportunities (on- and off-site)
- Identifying scholarship/fellowship opportunities and encouraging Scholars to submit applications
- Central data management office
- News releases to local newspapers, publication of updated brochure, publication of newsletter currently in progress, flyers for campus distribution
- LS-OKAMP flyers distributed to SMET faculty at Lead Institution
- Inclusion of Exhibitors in Summer 2000 Research Symposium

**Coherence of program** is accomplished through joint planning at monthly Alliance meetings, by frequent electronic contact, and other means of communication. The Alliance is made up of: Project Director, Program Manager, Data Manager, Evaluator, Chancellor's liaison from the Oklahoma State Regents for Higher Education, and Campus Coordinators from each of the 10 Partners institutions. When deemed necessary, Alliance meetings include other key personnel; for example, an Alliance presentation on **Cost Share** involved financial officers from each Partner Institution.

**COST SHARE:**

Cost share is achieved 1) through use of facilities 2) providing transportation for Alliance meetings 3) Provision of Bridge Program funding and tuition waivers by the Oklahoma Regents for Higher Education 4) institutional/departmental support for summer research internships

## **STUDENT ACHIEVEMENT HIGHLIGHTS**

### **University of Oklahoma:**

**Shiloe Bear**; one of OU's most research-oriented AMP scholars with the following research involvements: **Summer '99**: She participated in the University of California's (Berkeley) undergraduate research program under the mentorship of Dr. Lisa Pruitt. For Shiloe, research is not based solely on success and failure, but on discovery. Her work was in the area of bio-materials for total joint replacement with a specific assignment to identify ways to sterilize polymers once in the body. Although a solution was not found, it was determined what did not work. Says Shiloe, "that in itself is discovery!" **Fall '99**: She worked with Dr. Chang and a team of mechanical engineers at OU to design and fabricate a baby crib with a movable tray and pair of wheel chair armrests for a local physically disabled Norman, OK resident. **Spring 2000**: Shiloe was a research scholar under the supervision of Dr. Rong Gan working in the area of soft tissue testing for applications in implant hearing aid devices.

Shiloe has been accepted into the International Association for the Exchange of Students of Technical Expertise (IAESTE of United States). She will spend one year in Bern, Switzerland working for Mueller Institute for Biomechanics. Upon graduation, Shiloe plans to attend graduate school with an emphasis in biomechanics.

### **Southeastern Oklahoma State University:**

Southeastern University awarded a total of 19 LS-OKAMP stipends last academic year - ten in the fall and nine in the spring. Stipend recipients that participated in summer internships were also involved in academic year research activities that resulted in **ten presentations** at the following professional meetings:

- **Regional Research Day**, University of Central OK;
- **American Chemical Society Pentasection Meeting, University of Tulsa;**
- **Frederick Conference on Capillary Electrophoresis, Hood College in Frederick, MD; 21st International Symposium on Capillary Chromatography and Electrophoresis, Park City, UT. Colorado AMP meeting (July 2000).**
- **Presentations and other activities:**  
EXPLORATIONS OF ALKYL POLYALCOHOLS AS "CLASS I" ORGANIC MODIFIERS TO ADJUST SELECTIVITY IN MICELLAR ELECTROKINETIC CAPILLARY CHROMATOGRAPHY. **Gerald I. Love and Joel T. Smith**
- PREDICTING THE EFFECTS OF ORGANIC MODIFIERS ON SELECTIVITY IN MICELLAR ELECTROKINETIC CAPILLARY CHROMATOGRAPHY.  
Athena Dawson and Joel T. Smith
- ADJUSTING SELECTIVITY IN MEKC USING "CLASS I" ORGANIC MODIFIERS. Joel T. Smith, **Gerald I. Love and Athena R. Dawson**

- ADJUSTMENT OF CHROMATOGRAPHIC SELECTIVITY IN MICELLAR ELECTROKINETIC CAPILLARY CHROMATOGRAPHY USING "CLASS I" ORGANIC MODIFIERS; Joel T. Smith, **Gerald Love**, and **Athena Dawson**
- (**Gerald I. Love** also made presentations at the 3<sup>rd</sup> Annual Student Research and Creative Arts Symposium, TWU, April 6; American Chemical Society Meeting in Miniature , Cameron University, April 8; Oklahoma Section of the American Chemical Society meeting, OSU, April 8; Epscor Research day, April 17)
- **Joe M. Williams (zoology)** and **Melissa Morales (zoology)** attended the Oklahoma Academy of Science Field Meeting (September 17-19, 1999) at Black Mesa State Park in Kenton, OK
- **Mellisa Morales** attended the annual meeting of the American Fisheries Society, March 1-3, 2000, Oklahoma City, OK
- **Josh Wingfield** participated in Student Conservation Experience Program with the US Army Corps of Engineers at Lake Texoma, Spring 2000.
- **Melissa Morales was summer 2000 Intern with the US Army Corps of Engineers at Lake Texoma.**

**East Central University:**

Loretta Rush, East Central senior Biology major, made oral and poster presentations at the National SACNAS (Society for Advancement of Chicanos and Native Americans in Science) meeting last fall. More than 500 faculty and students attended the meeting at the Oregon Convention Center in Portland. Rachel's oral presentation was entitled, Something Old That is New Again – Herbal Antibiotics – Do They Work? The abstract for her poster presentation was entitled, Determining the Sensitivity of Microbial Isolates to Suspected Herbal Antimicrobial Agents. Research mentors were Dr. Glenn Kuehn and Dr. James Botsford, New Mexico State University.

**Oklahoma State University:**

**Paul De La Cerda** was named one of Oklahoma State University's **TOP 10 SENIORS** for 2000. A civil engineering May 2000 graduate, Paul received many honors that included National Hispanic Student Leader of the Year and Minority Engineer of the Year. He received a patent for his *Pooch Pass Home Security Pet Door* and is President and CEO of Pooch Pass, Inc.

**OKAMP scholar contributes to publication :**

**Mark Clytus**, industrial engineering major at OSU, was a 1999 summer Intern in the Department of Chemical Engineering at Pennsylvania State University. Much of his work involved pressure-drop studies in root hairs that resulted in a publication entitled



"Inhibitory Role of Root Hairs on Transport Within Root Culture Bioreactors" by Julia L. Bordonaro and Wayne R. Curtis. The paper acknowledged Mark's contributions and the Oklahoma Louis Stokes Alliance as a contract grant sponsor.

**Scholars recognized at MDAC program:**

The Oklahoma State University *Multicultural Development and Assessment Center (MDAC)* held its annual AWARDS BANQUET on April 12 in the Student Union Ballroom. The following OSU LS-OKAMP Scholars received recognition:

**Outstanding Participation Awards**

Jeffrey Brower  
Mark Clytus  
Sidney Carter Jr.  
Shalonna Daniels  
Dwayne Gardner  
Patrick McLean  
Juan Molina  
Johnnetta Nesbitt  
Thomas Patten  
Donald Seger  
Brandon Wilson

**Research Awards**

Paul De La Cerda  
Dwayne Gardner  
Sidney Carter

**Leadership Awards**

Johnnetta Nesbitt  
Dwayne Gardner

**Mitchell Award for Outstanding Louis Stokes OKAMP Scholar**

Dwayne Gardner

**OSU HAS GATES MILLENNIUM SCHOLAR:** Congratulations to *Ms. Valerie Shangreaux*, Oklahoma State University's *LS-OKAMP Campus Coordinator since 1994*, on being named an inaugural year Bill Gates Millennium Scholar! Ms. Shangreaux, who is a member of the Oglala Sioux Tribe, is a doctoral student in Educational Psychology. The award provides funds for the cost of tuition, fees, books, and living expenses for the 2000-2001 academic year.

Eligibility requirements, in addition to nomination and high academic standing, included demonstrated leadership ability; acceptance in an undergraduate or graduate degree program in mathematics, life or physical sciences, computer science, engineering, education, or library science. Eligible applicants were also required to be African American, American Indian/Alaskan Native, Hispanic, or Asian Pacific American. Ms. Shangreaux was nominated by Dr. Earl D. Mitchell, Associate Vice President for Multicultural Affairs.