The Louis Stokes Mississippi Alliance for Minority Participation: 20th Year Impact Report **TABLE OF CONTENTS**

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The Louis Stokes Mississippi Alliance for Minority Participation: 20th Year Impact Report **FOREWORD**

The Louis Stokes Mississippi Alliance for Minority Participation (LSMAMP) is proud to be a part of this national structure of organizations that has been created and supported by the National Science Foundation. Along with the other member alliances, LSMAMP has made a significant difference in increasing the number of underrepresented minority students who have attained their baccalaureate, masters, and doctorate degrees in the fields of science, technology, engineering and mathematics (STEM.) The benefits to our nation of this increase in the diversity of the nation's scientists and engineers, both over the last 20 years and into the future, cannot be over estimated.

In this publication, we have attempted to share some of the highlights of the exceptional story of LSMAMP.

First, our executive summary presents the structure of our program along with some of the statistics that underlie our overall success of graduating a total of 9,058 students with BS STEM degrees in the first twenty years of the program. This Excutive Summary was prepared for us by Jean Gordon Cook of the JSU Public Relations Department and will later appear in the Jacksonian Magazine. The body of the report goes into the details of the accomplishments of the LSMAMP program in the aggregate and then presents the growth statistics for each of the alliance institutions, along with personal stories of students from each site. For each school, one or two of their outstanding students are also featured. These pages also introduce you to the five (5) Program Directors that have lent their leadership skills to LSMAMPover the years and to the site coordinators who have given of their time and talents to support and encourage our students.

We only hope that this publication expresses just a bit of our excitement for this program and of the chance it has given so many STEM students to achieve their dreams.

Felix A. Okojie, EdD, MPH, CRA Vice President of Research and Federal Relations and Professor of Public Health and Education LSMAMP PI

> Abdul K. Mohamed, PhD Dean Emeritus LSMAMP Co-PI

Ashton Hamme, II, PhD Associate Professor of Chemistry LSMAMP Co-PI



The award winners from the 6th Annual LSMAMP National Research Symposium.



The Louis Stokes Mississippi Alliance for Minority Participation: 20th Year Impact Report **EXECUTIVE SUMMARY**

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When Louis Stokes Mississippi for Minority Participation (LSMAMP) program alliance was created in 1991, no one could have anticipated the profound impact it would have on the fields of science, technology, engineering and mathematics (STEM), where minorities have long been underrepresented.

Today, thanks to the launch of the LSMAMP consortium - which is made up of eight institutions of higher learning in Mississippi - the number of minorities with STEM degrees

from Mississippi's colleges and universities has soared to a total of 9,058 over the years of the program. This rise is an increase of 106% in the 20 years of the program. This is more than double the rate of majority STEM students whose ranks grew by only 42% during the same period.

Funded by the National

Science Foundation, LSMAMP is part of a national effort to increase the number of underrepresented minority students earning undergraduate degrees in STEM fields. This feeds the long-term goal of boosting the number of minority PhDs in STEM fields, with an emphasis on entry into faculty positions. So far, the results at the doctoral level have also been striking. Since 1991, the number of minorities who have earned doctorates in STEM disciplines at the Institutions of Higher Learning of Mississippi has increased six-fold from 5 in 1991 to 36 by 2010.

"Our programs are diversifying STEM professions in Mississippi and throughout the country," said Dr. Abdul K. Mohamed, LSMAMP program director and Dean Emeritus of the Jackson State University College of Science, Engineering and Technology. "We take bright, motivated students and give them the support to succeed throughout their undergraduate studies and beyond."

Led by Jackson State University, the LSMAMP consortium currently includes Alcorn State University, Mississippi State University, Mississippi Valley State University, the University of Mississippi, the University of Southern Mississippi, Tougaloo College and Hinds Community College. The mix of Historically Black Colleges or Universities, majority-white universities and one community college ensures that minority students at a range of academic levels are reached.

"It was historically significant for Mississippi to get all of these white and black institutions to work together," Mohamed said. "There's been a coordinated effort at each institution, which has resulted in more collaboration among all of the schools."

The LSMAMP model includes collaborative learning, skill development, mentoring, academic enrichment, sum-

mer activities and other direct student support. Each alliance institution holds summer bridge programs for incoming freshman STEM majors, and they partner with businesses, government agencies, laboratories and professional organizations to connect students to internships, research projects and aca-

Mississippi shows a steep rise in the number of minority scientists and engineers through a statewide coordinated effort and funding from the National Science Foundation

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demic conferences.

Students have also had the opportunity to travel abroad to study or to present at conferences in Germany, France, Portugal, South Africa, Costa Rica, Japan, Sweden, Guatemala and Belize. In addition, LSMAMP partners have partnerships with institutions in China, Taiwan, Poland and India.

"The LSMAMP program has given the opportunity to study, perform research and travel internationally to so many students who might otherwise not have been able to do so," said Jackson State University president Dr. Carolyn W. Meyers. "This building up of global thinkers over the last 20 years is an accomplishment to be celebrated and continued into the future."

After earning their degrees, LSMAMP scholars are eligible to apply to the Bridge to the Doctorate Program, which is based at Jackson State. Through this National Science Foundation-supported program, students receive funding, including a stipend, for their first two years of graduate school at JSU. They also receive mentoring, academic enrichment, research experiences, assistance to travel to conferences and access to top scientists and engineers. The Bridge program also helps students secure funding for their chosen doctoral programs.

To date, 94 students have participated in the Bridge program, and 72 have bridged to Ph.D. programs. The scholars are pursuing doctorates at 24 different institutions including Albany Medical College, Carnegie Mellon University, the Georgia Institute of Technology, Howard University, Princeton University, the University of Mississippi Medical Center and Vanderbilt University.

Each of the alliance schools has contributed to LS-MAMP's success by significantly boosting minority STEM students and graduates since 1991. The majority white institutions have shown the most dramatic increases, while the HBCUs built upon their steady track record of educating minorities.

One of the leading institutions in the consortium in its rate of growth is the University of Mississippi, which has

increased its STEM enrollment from 151 to 322 (a 113 percent gain) and graduates from 9 to 45 (a 400 percent gain).

"One of the first things the program did was to bring people together at every level who had not been working together before, from the presidential level to the student level," said Dr. Don Cole, LSMAMP site coordinator at the University of Mississippi and one of the founders of the program. "That pretty much infused the STEM culture with a focus on minorities in every sector of our university."

All of the other consortium schools also produced sharp increases in STEM graduates.

At the University of Southern Mississippi, STEM enrollment increased from 342 to 602 (76 percent gain) and graduates from 16 to 67 (319 percent gain).

Delta State increased STEM enrollment from 74 to 178 (141 percent gain) and graduates from 3 to 26 (767 percent gain).

Mississippi State increased STEM enrollment from 605 to 718 (19 percent gain) and graduates from 26 to 87 (236 percent gain).

Jackson State increased STEM enrollment from 1,255 to 1,406 (12 percent gain) and graduates from 105 to 146 (39

percent gain).

Alcorn State increased STEM enrollment from 571 to 610 (7 percent gain) and graduates from 56 to 87 (45 percent gain).

Mississippi Valley State had a decrease in STEM enrollment from 534 to 389 (27 percent loss), but increased graduates from 26 to 38 (46 percent gain).

Tougaloo College decreased STEM enrollment from 390 to 250 (36 percent loss), but increased graduates from 22 to 35 (59 percent gain).

Hinds Community College joined the alliance in 2010, and is producing STEM students who will move on to complete their undergraduate degrees at one of the consortium's four-year institutions.

Jackson State is one of the original six (6) institu-

tions and the only Historically Black College or University that the National Science Foundation funded in 1991 to lead a consortium dedicated to increasing minority participation in STEM disciplines. This alliance in Mississippi, launched 20 years ago, has been continuously funded by the National Science Foundation. Matching funds were also provided by the partner institutions during the first 15 years of the program. Moving into the future, the consortium institutions have to focus on

fundraising to sustain and expand the program.

"Jackson State University is proud to have led the Mississippi association of schools in the Louis Stokes Mississippi Alliance for Minority Participation program since its inception," said JSU President Meyers. "Our alliance has afforded the opportunity to build strong relationships among our institutions of higher learning. This collaboration has resulted in increased diversity, a higher number of STEM majors and graduates and more of those students advancing to higher degrees."

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Through conferences and other exposure to people in the fields I was interested in, it opened my eyes to the possibilities of what I could do.

- Jennifer Riley, PhD

HIGHLIGHTS / IMPACT

Introduction

LSMAMP was one of the first six alliances funded by the National Science Foundation (NSF) in 1991. The impact of LSMAMP in Mississippi has been dramatic and profound. Figure 1 on page 8 shows the enrollment trend and cummulative graduation rate from 1992 to 2008 for MAMP institutions. LSMAMP has graduated a total of 9,058 BS minority students in STEM.

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The LSMAMP is a historic statewide consortium of eight (8) colleges and universities (Historically Black Institutions (HBI's) - Alcorn State University (ASU), Jackson State University (JSU), Mississippi Valley State University (MVSU)), and one private college (Tougaloo College (TC)); three Comprehensive Research Universities - University of Mississippi (UM), Mississippi State University (MSU), and University of Southern Mississippi (USM), and a community college (Hinds Community College (HCC)). LSMAMP was one of the first six alliances funded by NSF to address the underrepresentation of minority students in STEM.

The impact of LSMAMP has been dramatic and profound in fulfilling its original LSAMP goals. During the past 19 years, the number of under-represented minority (URM) STEM students enrolled in LSMAMP increased by 106% which is more than double the rate of non-minority STEM students (42%), and the increase in graduates over the same period has been a phenomenal 212%. NSF Bridge to the Doctorate portion of LSMAMP reports that 91% of its graduates have entered PhD programs with five earning their Ph.D.'s.

Inter-institutional and intra-institutional co-operation and collaboration have been the hallmark of the LSMAMP strategy to implement the activities of the Alliance. While the LSAMP institutions are characterized by varied campus environments and diverse ethnic populations, the Alliance has succeeded in diminishing these differences by fostering a shared vision, ideas and resources. Also a significant factor contributing to the success of minority students in STEM disciplines in LSMAMP has been the focus on facilitating the empowerment of students.



President of Jackson State University, Dr. Carolyn Meyers (center, front row) and Interim Provost Dr. Quiton Williams (far right) with members of the 7th and 8th Bridge to the Doctorate Cohorts.



Dr. James A. Hicks, LSAMP National Program Director, is pictured with Charity Mosley, Cohort 1, the first to achieve her PhD.

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Other noteworthy accomplishments include the following:

• The number of UnderRepresented Minority (URM) students earning STEM PhD degrees at Mississippi universities increased from five (5) at the beginning of the LSMAMP porgram in 1991 to 36 in 2010.

• LSMAMP students participated in international research activities or conference presentations in China, Taiwan, Poland, India, Germany, France, Portugal, South Africa, Costa Rica, Japan, Sweden, Guatemala and Belize.

• LSMAMP has been organizing an annual research symposium for many years, and lately has expanded to integrate the NSF CREST and PREM programs in a joint symposium.

• Since its inception, all LSMAMP alliance institutions have held yearly Summer Bridge programs for incoming freshman STEM majors.

In order to continue and increase the current momentum of the programs listed above in Figure 1, the LS-MAMP program continues to implement and improve our recruitment and retention strategies through community college bridge programs; synergistic scientific leadership development programs; global internship research programs; business, industrial and governmental (BIG) STEM internship programs; outreach programs; institutionalization programs and other programs that contribute to LSMAMP's systemic shared transformative (SST) Vision.

The Vision is to produce and increase the number of highly competent, globally astute URM STEM graduates who are prepared to make a positive impact in graduate school and/or the workforce within the state of Mississippi and the nation. All of the Alliance universities are motivated and are highly aware of the benefits of the LSMAMP and strongly support its unique goals.

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HIGHLIGHTS / IMPACT



Infrastructure Development

The increase in STEM enrollment and especially BS STEM degrees awarded over the last 20 years of the LSMAMP program in Mississippi has been impressive. The rate of degrees awarded increased to produce a cumulative 9,058 graduates during these 20 years of the program. This type of growth has led to new buildings being constructed for STEM disciplines. On the campus of JSU, a new wing was built and renovations were executed on the 94,000 sq. ft. Just Science Hall (JSH) including a new observatory.

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The newly approved engineering school at JSU was followed by a newly constructed engineering building. Alcorn State University (ASU), another major producer of underrepresented minority (URM) STEM students, has also invested in its STEM facilities through the erection of a \$10 million Math and Science Building with \$3 million in state-of-the-art equipment and a 42,000 sq. ft. Biotechnology Building.

Each undergraduate LSMAMP STEM major has an opportunity to participate in a coordinated undergraduate research experience led by both research faculty members and peer mentors to ensure students understand the value of STEM research. Through a combination of federal support and institutional support from the LSMAMP universities, LSMAMP students have access to state-of-the-art instrumentation and analytical tools.

The LSMAMP program has greatly contributed to creating an environment where the research programs at LSMAMP institutions are interdisciplinary and inter-institutional, as well as, nationally and internationally recognized. Mississippi-based research programs have the prowess to not only partner with elite institutions, but also to attract students from other parts of the United States and the world thereby providing LSMAMP with global research experiences.



New Math & Science Building at Alcorn State University



New Addition to Just Science Hall at Jackson State University

Alcorn State University

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This institution has always been a major supporter of LSMAMP, and has had the same site coordinator, Dr. Troy Stewart, since the inception of the program. As can be seen in Figure 1 below, Alcorn has always had a strong number of STEM majors with a 7% increase in enrollment.

Figure 2 shows a 48% increase in the number of STEM degrees awarded and thus indicating that the institution did an excellent job in the implementation of retention strategies.



A Word from Samuel L. White, PhD, Director of Sponsored Programs

Alcorn State Univesity enthusiastically supports the continuation of a program that helps to develop an increasing pool of minority scientists and engineers to maintain the global competitiveness of this nation now and in the future. The LSMAMP program at ASU has served as a beacon of light to the entire Science, Technology, Engineering and Mathematics community on campus.

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Cecilia Newsome McGowan, PhD

At ALCORN State University, the LS-MAMP program expanded Cecilia's experience of research techniques. "I appreciate that the program afforded me the opportunities to attend conferences and participate in summer research outside of Mississippi." Dr. McGowan attained a Masters degree in Chemistry from the University of Arkansas at Fayetteville and then a PhD in 2008 in Environmental Toxicology at Jackson State University.

As a scientific researcher, Dr. McGowan has especially enjoyed the opportunity to travel internationally to present papers in both Poland and France.

Currently, Dr. McGowan serves as the Department Chair of Science at Crystal Springs High School and teaches in the summers at Alcorn State University while she prepares to further her career by attending medical school.

Dr. LaToya Myles

LaToya always loved science, particularly biology. So her plan was to take pre-med at Alcorn State University but before her freshman year, she attended an LSMAMP Summer Bridge Program where she was introduced to applied physics, biochemistry, cell biology and other branches of science. Dr. Myles says of that summer, "I had an experience that broadened my perspectives and changed the course of my career."

She also changed her major. Dr. Troy Stewart, Site Coordinator, recommended that she reach for a subject that would really challenge her, like chemistry. Dr. Myles said, "I wasn't comfortable entering a field where I wasn't sure of the answers. Dr. Stewart's reply still resonates with me. He said that science is all about not knowing, about having questions and seeking answers." Dr. Myles earned BS degrees in chemistry and biology and a PhD environmental sciences from Florisa A&M. She is a researcher and "doctor" at the National Oceanic and Atmospheric Administration.



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Delta State University



Delta State was a strong member of LSMAMP for over fifteen years and showed dramatic results in both STEM enrollment and STEM degrees awarded.

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As can be seen in Figures 3 and 4 below, they increased STEM enrollment over the twenty year period of the program by 141% and increased the number of STEM degrees by 767%.



DeGail Hadley

Dr. Hadley graduated in 2004 and in his senior year, he was designated as an LSMAMP student of the year. DeGail participated in two summer research programs at Mississippi State University and co-authored a paper that was published in *Biotechnology Progress*. Dr. Hadley says, "The MAMP program enabled me to learn how to get involved in scientific research, how to communicate among my peers and research professors, and the program taught me how to prepare myself to become successful in any branch of science or math."

DeGail went on to receive a doctorate degree in Osteopathic Medicine from Kansas City University of Medicine and Biosciences. Currently in Michigan, Dr. Hadley is a Family Medicine Resident and aspires to "establish a medical pratice in the south to further serve the community that has given so much to me."

DeGail Hadley



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Hinds County Community College began as the Hinds County Agricultural High School, which opened in Raymond in the fall of 1917 with the purchase of 45 acres of land that became the campus. The original Raymond campus with its four buildings valued at \$75,000 has seen phenomenal growth to 177 buildings, 1,700 acres and other major facilities located in Jackson, Rankin County, Utica and Vicksburg. For over 90 years, from an original Hinds County Agricultural High School enrollment of 117 in 1917, Hinds Community College in 2006-2007 served some 17,716 students in a myriad of programs including academic, technical, career, workforce and secondary offerings.

Despite its impressive growth and diversification, the college remains true to its original functions: to make education accessible and affordable to the common citizen. Relying on this fundamental formula, Hinds continues to expand its programs. In 1996, Hinds joined Community Colleges for International Development (CCID). That year, administrators took a visit to Russia that resulted in an exchange program between Hinds and Adler College in Sochi, Russia, an area on the Black Sea that will host the 2014 Winter Olympics.

In 2009, Hinds Community College took advantage of the opportunity to join the LSMAMP program. Hinds Community College already had a Memorandum of Understanding (MOU) with Jackson State University and an articulation agreement which allows for an easy transfer of credits. Hinds Community College has chosen Dr. Marquise Loving, Academic Dean of the Jackson Campus, as their Site Coordinator.

Hinds Community College's LSMAMP Award Winners



La'Cambrion Allen



Sondra Moncure

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Jackson State University

Jackson State University (JSU) serves as the lead institution for LSMAMP in Mississippi and has always been strong in both the enrollment and graduation of students seeking STEM degrees.

Figures 5 below reports a continuously strong enrollment going from 1,255 students in AY 1992-1993 to 1,405 in AY 2009-2010, yielding an increase of 12%. Through the efforts of programs such as LSMAMP, JSU has considerably increased the number of those enrolled who graduate. Figure 6 below shows a considerabe increase of 39% in those receiving STEM degrees during the period of the program.



A Word from JSU President Carolyn Meyers, PhD

Jackson State University is proud to have led the Mississippi association of schools in the Louis Stokes Alliance for Minority Participation (LSAMP) program since its inception 20 years ago. Our alliance has afforded the opportunity to build strong relationships among our Institutions of Higher Learning and this has resulted in increased diversity, a higher number of STEM majors and graduates and more of those students advancing to higher degrees.

The LSAMP program has given the opportunity to study, perform research, and travel internationally to so many students that might otherwise have been unable to do so. This building up of "global" thinkers over the last 20 years is an accomplishment to be celebrated and continued into the future.

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Jackson State University





Eddie Parker in his seventh grade presentation at the Department of Energy in Washington, D.C.



Eddie Parker is now a full-time student at Jackson State University.

Eddie Parker

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Seventh grade was the starting point for Eddie Parker's passion for science. That year, after participating one Saturday a month in the Pre-College Awards for Excellence program at Jackson State University, Parker was awarded a trip to Washington, D.C. to present his research at a conference sponsored by the Science and Engineering Alliance (SEA) and the Department of Energy (DoE.) Parker wowed the crowd. As Dr. Bob Shepard of SEA said, "This young man was so impressive during his presentation before over 300 people. When I see young people like Parker and the other students from Mississippi, I know that the future is in good hands."

Eddie Parker's interest in science continued throughout his high school years. He spent his summers on internships at NASA and at the White House, and continued toward his goal of a career in science.

In the fall of 2009, Eddie Parker entered Jackson State University as a biology major and with a Presidential academic scholarship. He also works parttime to cover his other expenses at school. Parker is looking forward to conducting faculty mentored research with Dr. Raphael Isokpehi in Informational Biology and to the stipend he will receive for doing so by being a part of the LSMAMP program.

Like all LSMAMP students, Eddie will be encouraged to present his research results at conferences such as the ABRCMS national conference and to pursue an external summer research internship.

Hopefully, LSMAMP will be able to continue to contribute to Mr. Parker's academic success as he pursues a PhD and works to attain his goal "to rid the world of nuclear weaponry."

Jackson State University





Dr. Angela Fortner McKoy

Dr. Angela Fortner McKoy

Angela came to Jackson State University to major in Chemistry and received her BS Degree in 2004. LSMAMP supported her research with Dr. Paresh Ray and her travel to present at conferences. She joined the second cohort of the Bridge to the Doctorate Program and did her external summer research at Berkeley National Laboratory with Dr. Richard Mathies. Ms. Fortner McKoy published two papers while attaining her masters degree and was offered an assistantship in a PhD program at Princeton University, where she recently received her PhD. She is currently serving in a Post-doc position at Rutgers University.

Angela has always been an outstanding student and that fact may lead many to assume it was a smooth road from undergraduate school to the esteemed campus at Princeton, but the path wasn't always obvious to Angela. She says, "Before joining the Bridge to the Doctorate program, I had no idea what I wanted for the future. LS-MAMP allowed me the opportunity to network and visit with top universities and convinced me that a PhD was an attainable and worthwhile goal."

Dr. Wilbur Walters

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Dr. Wilbur Walters graduated from Jackson State University (JSU) in 1995 with a BS in Physics. While at JSU, he was a member of LSMAMP and did faculty mentored research. He went on to earn both an MS in Materials Engineering from the University of Alabama at Birmingham in 1998 and a PhD from the University of Alabama, Tuscaloosa, in Materials Engineering in 2002.

Dr. Walters returned to JSU in 2002 to accept a unique joint appointment as an Assistant Professor in Civil Engineering and Physics. Dr. Walters is currently an Associate Professor and the Interim Chair of the Department of Physics, Atmospheric and Geosciences.



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Dr. Ashton Hamme II

A native of Michigan, Dr. Hamme was a Jackson State University (JSU) student and LSMAMP participant who went on to get his PhD in Synthetic Organic Chemistry from The Ohio State University. He then joined a research team at Monsanto/Pharmacia where he was the co-inventor of over 10 patents.

After working in industry for a number of years, Ashton Hamme returned to the JSU campus as a faculty member. He earned the Junior Faculty Research Productivity award in 2006 and Teacher of the Year in 2007. Currently, he holds the position of Associate Professor and is a co-Principal Investigator of the LSMAMP program.

Dr. Hamme valued the opportunities to hear lectures from highly regarded scientists during his LSMAMP tenure and finds academia to be the "best of both worlds." Dr. Hamme says, "I have the opportunity to lead programs related to my own research while also teaching some of America's best and brightest students."





Dr. Eric McClendon

Eric McClendon, PhD

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Eric arrived as a Freshman at Jackson State University having just "found chemistry to be my niche" and knowing that he wanted to be a researcher. He began research under the mentorship of Dr. Ken Lee and for Department Chair Dr. Hongtao Yu, who remarked on Eric's "strong potential to become one of the next generation of researchers."

Dr. McClendon also had a summer of research at the University of Southern Mississippi on *Real-Time Monitoring of Ring-Opening Bulk Polymerization of e-Caprolactone Using FTIR-Spectroscopy*.

McClendon was chosen for the first cohort of the Bridge to the Doctorate Program, where he was grateful that the fellowship "allowed more time for study and research by keeping me from having to find a job."

Eric continued in the doctoral program at JSU and received his PhD in 2009 with Dr. Hamme. Now aiming to become an interventional cardiologist, Dr. Eric McClendon is conducting research with Dr. Herman Taylor for the Jackson Heart Study while completing his medical studies at the University of Mississippi Medical Center. Dr. McClendon is positioned to become one of the few African American Ph.D./M.D.'s in the United States.

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Mississippi State University

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Mississippi State University (MSU) has reaped the rewards that are possible by instituting and supporting such programs as LSMAMP. As the Figures below demonstrate, with an increase in enrollment of underrepresented minorities of 19%, MSU was able to greatly increase the number of those students receiving their degrees by 236%, Figure 8.



Figure 7: Mississippi State University Change in STEM Enrollment Awarded AY 1992 -1993 vs. AY 2009-2010



Figure 8:

Change of 236%

Mississippi State University Change in STEM Degrees Awarded AY 1991 -1992 vs. AY 2009-2010

A Word from MSU President Mark E. Keenum, PhD

LSMAMP has been a major contributor in increasing enrollment, retention and graduation rates of underrepresented minority students in STEM majors at Mississippi State University. Through this program the university has made tremendous strides toward reaching our goal of graduating more students of color in the STEM fields.

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Mississippi State University



Terrance West, PhD

As an Electrical Engineer, Dr. West works at the Aviation and Missile Research Development and Engineering Center (AMRDEC) in Huntsville, AL. His work encompasses the research, development design, integraton and testing of radio frequency sensor stimulators.

At **Mississippi State University**, Terrance started in the LSMAMP program before he even arrived on campus by attending the Summer Bridge Program. Dr. West credits the mentorship program in the Summer Bridge experience that continued through his freshman and sophomore years as having the greatest impact on his academic success.

Dr. West's advice for students is "to take advantage of the opportunities that the LSMAMP program provides and to participate in some type of research activity as an undergraduate, because the information and tools you gain through these experiences will aid you throughout your academic and professional careers."

Jennifer M. Riley, PhD

LSMAMP graduate Dr. Jennifer Riley, who earned her undergraduate degree in chemical engineering and her master's and Ph.D. in industrial engineering at Mississippi State University, credits the program with exposing her to career options she had not known existed.

"Through conferences and other exposure to people in the fields I was interested in, it opened my eyes to the possibilities of what I could do," said Riley, who is a principal research associate at SA Technologies, Inc., which is a small, women-owned human factors research firm in Marietta, GA. "Graduate school really helped me find a niche that was most appropriate for me."

A native of Tylertown, MS, Riley said she had been on a traditional engineering path until her graduate studies shifted her focus to industrial engineering and cognitive engineering. In her current position, Riley supervises a research group in exploring the use of virtual reality and games in training users in cognitive skills for federal agencies, including the U.S. Department of Defense.



Dr. Jennifer M. Riley



Mississippi Valley State University

Although Mississippi Valley State University (MVSU) shows a decrease in the enrollment of underrepresented minority students of 27% in Figure 9 below, there was a significant increase in the graduation rate of STEM students, reflecting a change of 46%. (Figure 10.)



Figure 10: MISSISSIPPI Valley State University Change in STEM Degrees Awarded AY 1991 -1992 vs. AY 2009-2010

A Word from MVSU President Donna H. Oliver, PhD

Mississippi Valley State University has participated in the Mississippi Alliance for Minority Participation Program (LSMAMP) since its inception twenty years ago. This program provides both orientation and enrichment experiences in research and critical thinking skills which prepare our students for completion of terminal degrees in science, engineering and mathematics. The major components of LSMAMP which enrich our students at the "Valley" are The High School-to-College BRIDGE Program and The Increase Minority Access to Graduate Education (IMAGE) Program. Our LSMAMP Summer Bridge Program has helped each year to increase the number of students attending the university. ... Recently, our students have won first and second place in the National Research Symposium. This program has enriched the lives of many of our students.

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Mississippi Valley State University

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William Clay (on left) with Dr. Glake Hill and Congressman Louis B. Stokes

William Clay

Mr. Clay entered the Bridge to the Doctorate after completing his BS degree at Mississippi Valley State University. He is pursuing his PhD in Mathematics at the University of California Santa Barbara. He had a summer internship with Dr. Linda Petzold, a AAAS Fellow, while he was a Bridge to the Doctorate fellow at Jackson State University. Clay says of his time with LSMAMP, "I knew I wanted to pursue an advanced degree, but these programs gave me the confidence and the skills to see it through."

Curtistine Deere

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Ms. Deere is pursuing her PhD in Environmental Toxicology at Southern A&M College in Baton Rouge, Louisiana, and is being mentored by Dr. Michelle Claville.

While attending Mississippi Valley State University as an undergraduate in Biology, Curtistine was an active member of LSMAMP. Here is what she has to say about the program,

"MAMP provided me advantages to participate in technologically advanced research using state of the art instrumentation and to travel to research conferences to compete with students from all over the United States. It also provided an avenue to meet and talk with graduate school recruiters. My advice to any student that joins MAMP is to take advantage of all the opportunities that it has to offer."





At Tougaloo College, even though the enrollment decreased by 36% (Figure 11), the graduation rate increased by 59% during the same period. This is a clear indication of the effectiveness of the retention stratagies employed across the board at LSMAMP partner institutions.



Figure 11: **Tougaloo College** Change in STEM Enrollment AY 1992 -1993 vs. AY 2009-2010



Change of 59%

Figure 12: **Tougaloo College** Change in STEM Degrees Awarded AY 1991 -1992 vs. AY 2009-



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Tougaloo College



Glake Hill, PhD

Dr. Hill received an BS degree in chemistry from Tougaloo College and initially headed off to medical school. However, the experience he had there, coupled with his experience in conducting research during the summers with Dr. Jerzy Leszczynski, convinced him that his real interests were in research and teaching. He went on to earn a PhD in Computational Chemistry at Jackson State University with "Dr. Jerzy" and completing a post-doc position at the University of California Berkeley.

After his post-doc, Glake returned to join the faculty at Jackson State University, where he is now an Associate Professor and mentors students in his own lab.

Kristen Lewis

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Tougaloo College graduate Kristen Lewis (2009) was a major in Chemistry. Dr. Glake Hill (*see above*) recruited her for the graduate program in Chemistry at Jackson State University (JSU) and Kristen was accepted into the NSF Bridge to the Doctorate Program (BD.)

While a LSMAMP student at Tougaloo, Kristen spent three (3) years as a research assistant in the Jackson Heart Study under the mentorship of Dr. Sarah Buxbaum.

Kristen finished the BD program and is now working on her PhD at JSU in Computational Chemistry. She has traveled to China to learn about research in that country and served a summer research internship at Indiana University. Kristen credits LSMAMP with offering "great opportunities for research and conferences, international travel and the peace of mind from not incurring debt while completing my studies."





University of Mississippi

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The University of Mississippi has had an impressive increase in both the percentage of URM students enrolled in STEM fields and in the percentage of those students achieving their degrees.

Figure 13 shows a 113% increase in enrollment and Figure 14 shows a 400% increase in degrees awarded.



A Word from UM Chancellor Daniel Jones, PhD

Over the past twenty years, the Louis Stokes Alliance for Minority Participation (LSAMP) program has had an enormously positive impact on programming at the University of Mississippi as it has allowed us to leverage state funds to tremendously increase the number of minority STEM graduates. Moreover, LSAMP served as the catalyst to spark other such initiatives and support programs leading to increased post baccalaureate degrees for our students. Indeed, we are pleased to have had faculty ranks filled with some of our own AMP graduates and we look forward to the continuation of this vital program.

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Montray Leavy, PhD

Montray Leavy, PhD

Montray earned his BS in Analytical Chemistry at the University of Mississippi in 1993. He continued at Ole Miss and received his PhD in Electrochemistry in 1999.

As an undergraduate member of LSMAMP, Dr. Leavy received encouragement in continuing his studies and thoroughly enjoyed the opportunities to travel to scientific research conferences and network with researchers and other students. During his graduate studies he worked for the LSMAMP program as a tutor in Chemistry and Math. He credits this opportunity to help undergraduate students as his inspiration to continue on to earn his terminal degree.

Dr. Leavy currently works as a research scientist for a large corporation in California. He has co-authored more than 5 peerreviewed journal articles in the field of electrochemistry and high vacuum disposition. He is also the inventor of 6 patent applications. His job also affords him the opportunity to travel extensively, most recently to Singapore.

Dr. JaWanda Grant

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The first thing Dr. Grant said when asked about the LS-MAMP program was "I LOVED IT!" This 2002 graduate from the University of Mississippi may be the program's biggest fan. She first encountered LSMAMP students in the program's summer bridge while she was conducting research the summer before her freshman year. She had such a good time with them that she knew she wanted to be a part of the program.

"I don't know where I would be without LSMAMP. It made a world of difference in my path," Dr. Grant stated. JaWanda went on to achieve her PhD in Pharmacology at the University of Tennessee Health Science program in Memphis, TN, and to complete a post-doc in environmental medicine at New York University (NYU) as an NIH Ruth Kirschstein Fellow.

Dr. Grant is currently the founding Director of the Quantitative Reasoning Center at Vassar College.



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University of Southern Mississippi

The University of Southern Mississippi (USM) has also shown a decidedly striking increase in the percentage of underrepresented minorities who are earning their degrees in STEM fields.

Figure 16 shows that the increase in enrollment was 76%, while the degrees awarded increased by 319% (Figure 16).



A Word from USM President Martha Saunders, PhD

We are especially proud of the increase in underrepresented minority students in the Southern Miss STEM programs and of the overall twenty-year impact increase resulting from the existence of the Louis Stokes Mississippi Alliance for Minority Participation (LSMAMP). The program began under the able leadership of our Dean of the College of Science & Technology, Dr. Joe Whitehead, when he was an assistant professor. We are grateful for the kind of dedicated support he and other faculty and staff have provided over the past two decades.

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University of Southern Mississippi

Will Gray

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A graduate from the University of Southern Mississippi (USM), Will Gray majored in polymer sciences and was an award winning presenter at two of LSMAMP's annual research symposiums: work on Investigating Antibody-Polymer Bead Conjugation for Antigen Detection using Surface Plasmon Resonance (SPR) and Quartz Crystal Microbalance and Surface Plasmon Resonance Studies of Functionalized Polymer Particles.

Will was a member of LSMAMP all four years of his career at USM. His strongest memories are of assistant site coordinator, Travis Griffin, whom he said, "required a lot from students and that created a structure that made me a better student."

Mr. Gray is currently working on a master's degree at Mississippi State University.



Will Gray



Dr. Kalena Stovall

Kalena Stovall, PhD

Kalena graduated from the University of Southern Mississippi (USM) in 2004 with a BS in Polymer Science. She attained her PhD in Chemical Engineering at the University of Illinois at Urbana-Champain in 2009 and is a Research Associate with Exponent Failure Analysis Associates, where she tests for product failure, works on product improvement and developing new products.

Dr. Stovall says that "while at USM, I had the pleasure of working with such talented professors as Dr. Robert Lochhead, who introduced me to polymer science when I was in the 7th grade." She also participated wholeheartedly in LSMAMP, which she says "helped prepare me for professional interactions through workshops and other events geared toward professional advancement."

Dr. Stovall also remains dedicated to working with young women and minorities and fostering their interest in STEM areas.

Louis Stokes Mississippi Alliance for Minority Participation ANNUAL RESEARCH SYMPOSIUMS

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The Annual LSMAMP Research Symposium has been held each of the last six years and is attended by 200 to 250 students and faculty members from all the partner institutions and from other schools in the region.

The symposium allows students to present their faculty mentored research from both academic and summer internship placements. Both oral and poster presentations are judged by faculty and monetary awards are made to both undergraduate and graduate students.

Networking is also key at the events which feature keynote addresses from reknowned scientists and engineers from around the country.



Students from the University of Southern Mississippi pause for a group picture during the symposium.



Former Bridge to the Doctorate Fellows returned to the Symposium to share their experiences of graduate PhD programs with the attendees. Pictured from left to right: Angela Fortner from Princeton University, Derrick White from the University of Nebraska in Biology and Kylie Nash from the Mississippi State University in Industrial Engineering.



LSMAMP Students gather together in the new Engineering Building at Jackson State University for the beginning of last year's Annual Research Symposium.



LSMAMP students explain their research during the poster sessions.



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Louis Stokes Mississippi Alliance for Minority Participation
ANNUAL RESEARCH SYMPOSIUMS



Andrea Marshall, USM Winner



LSMAMP student poses with speaker Dr. Linda Petzold from the University of California Santa Barbara.



LSMAMP students gather information on research opportunities at Big 10 schools from Denise Yates from the University of Illinois - Chicago..



Tougaloo College students gather at the symposium.



The student representatives from the University of Mississippi pose for pictures towards the end of one of the LSMAMP Annual Research Symposiums.



Louis Stokes Mississippi Alliance for Minority Participation BRIDGE TO THE DOCTORATE PROGRAM

The goal of the Louis Stokes Mississippi Alliance for Minority Participation (LSMAMP) Bridge to the Doctorate Program (BD) is to bridge LSAMP students who have received a baccalaureate degree in Science, Technology, Engineering or Mathematics (STEM) area into a STEM doctoral program. Fellowships are provided for the first two years of graduate study through a grant received from the National Science Foundation. The objective of this grant is to broaden participation of underrepresented students in STEM disciplines. It seeks to remove students' hesitancy about entering graduate school and the fear of creating financial indebtedness. Assessment of our data and records of accomplishments are summarized in Table 1 below.

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As shown in Table 1, of a total of 94 students, 72 have been admitted into PhD programs, 11 have earned the PhD, 40 are completing their dissertations or coursework (from Cohorts 1-6). In Cohort 7, so far, nine (9) students have been admitted into PhD programs and three (3) have applied for the PhD and are awaiting a response. Members of Cohort 8 are progressing well and are currently travelling to India and Poland before they start their regular summer internships in the U.S.A.



Table 1: Summary of LSMAMP-BD Career Outcomes	
Parameters:	Number:
Admitted to the BD Program	94
Admitted to PhD Programs	72
Earned Ph.D.	9
Completing Dissertation	8
Completing Ph.D. Coursework	30
Left Ph.D. & entered workforce	3
Joined workforce after MS Degree	7
Currently Applying to Ph.D.	2
Participated in International Programs	42
Summer Research Internships	94

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Louis Stokes Mississippi Alliance for Minority Participation BD STUDENTS WHO HAVE COMPLETED THE PHD

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Erika Brown 2011

Jackson State University Environmental Science



Jackson State University Environmental Science



Princeton University Biochemistry Serving a Post-Doc at

Rutgers University



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Tomekia Simeon is 1st BD Fellow to Achieve the PhD

Tomekia Simeon, Ph.D., was the first fellow from Cohort One to receive her doctorate degree from Jackson State University (JSU) in 2008. Currently, she is a Postdoctoral Research Fellow at Northwestern University (NU), where she conducts research in calibrating force fields with quantum electronic structure methods for supermolecular compounds.

In addition to her research pursuits she has developed Quantum Chemistry coursework materials for junior level engineering students. Her previous research efforts at JSU resulted in six publications in national and international peer-reviewed journals (J. Phys. Chem .and Inter. J of Quantum Chem.) and her mission is the same at NU (she has one submitted and one that will shortly be submitted). Dr. Simeon is passionate about encouraging and motivating students (K-12) and underrepresented populations to pursue careers and professions in STEM disciplines. Her volunteer outreach activities at NU include Science in the Classroom (SITC) (engaging 3rd grade students in different subject-based science demonstrations), weekly Science Club meetings at an inner-city Boys & Girls Club and serving as a mentor for chemistry undergraduate majors at Lake Forest College.

Dr. Simeon has extensive international travel and research experiences. In 2006, she traveled to the war-torn country of Liberia (Monrovia) to teach Chemistry and Biochemistry at impoverished high schools. She later returned to Africa twice in 2007 to present her research at the International Symposium on Nanomaterials and the International Conference for Globally Eradicating Health Disparities in South Africa. She has presented her work in other countries such as Poland, Guatemala, Czech Republic and India. In 2007, Dr. Simeon received the ORISE Fellowship to attend the 56th Meeting of Noble Laureates in Lindau, Germany. Her entrepreneurship pur-



suits also afforded her the opportunity to travel to Shanghai & Beijing, China. Overall, her tenure as a NSF Bridge to the Doctorate Fellow was a noble opportunity of scientific exposure. Dr. Simeon has interned at: the Engineering Research Development Center, Lawrence Livermore National Laboratory, and at the Office of Navel Research in Washington, DC, with the 1985 Noble Laureate in Chemistry, Dr. Jerome Karle.

Tomekia Simeon was a curious child, particularly about the world of science. Her parents encouraged her thirst for learning by surrounding her with people who supported the young scientist throughout her life and academic pursuits.

That support paid off. Simeon, a native of Jackson, Miss., went on to earn a chemistry degree from Tougaloo College and her master's and doctoral degrees in Computational Chemistry at Jackson State University.

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Tomekia Simeon is 1st BD Fellow to Achieve the PhD

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"That's the one thing I can say that has really helped me with my science education and life," Simeon said, "always having mentors and role models."

While in college, Simeon found mentors through her participation in the Louis Stokes Mississippi Alliance for Minority Participation (LSMAMP). Launched in 1991, the consortium is part of a national effort to increase the number of minority students earning undergraduate degrees in the fields of science, technology, engineering or mathematics (STEM), where minorities have long been underrepresented.

Simeon said the lack of minorities in her field is evident. "There is a disparity in gender and with different ethnic groups in science," she said. "But even when I'm discouraged, I have a mentor bank I can always go to."



Cohort 2 Alumna, Tomekia Simmons receives the award for best Oral Presentation from Dr. Art Hicks, National Director of LSAMP, at the LSMAMP National Research Conference.



Louis Stokes Mississippi Alliance for Minority Participation BRIDGE TO THE DOCTORATE INTERNATIONAL TRAVELS

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Poland

Front Row, Left to Right: Marcy Pilate, who was not able to make the trip, and Marquita Watkins. Back Row: Lionel Lovett and Takia Wheat.

Members of Cohort 8 of the NSF Bridge to the Doctorate program at Jackson State University were priviledged to journey abroad in the summer of 2011 to conduct research and expereience the varied cultures. Four students were chosen to travel to Poland and seven to India.

The Students who went to Poland (pictured above) were placed with research groups at Gdansk University in Gdansk. Marquita Watkins, a computational chemist, worked in Dr. Tomas Puzin's lab to learn more about Molecular Modeling, Optimization and Calculation, particularly, the Multi-tomic Exchange of the ZnO molecule.

Chemist Takia Wheat worked with Dr. Zbigniew Kaczynski whose research focuses on teh isolation and structural analysis of bacterial glycostrictures. In this lab, Takia Wheat worked on the NMR determination for aglycone component of penogenin-o-glycoside. In conducting her research, she learned more spectroscopy techniques such as Heteronuclear Single Quantum Coherence (HSQC) and Total Correlation Spectroscopy (TOCSY.) Computer Engineer Lionel Lovett worked with Dr. Cezary Czaplewski, Professor of Chemistry, in the field of Computational Chemistry and studied Protein Modeling using Molecular Dynamics.

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Louis Stokes Mississippi Alliance for Minority Participation BRIDGE TO THE DOCTORATE INTERNATIONAL TRAVELS

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This experience is one of the milestones in my career.

-Turquoise Alexander

India

The seven students pictured below spent three weeks at the prestigious Indian institute, the People's Education Society (PES) located in Bangalore in the Karnataka province. In the first week, they met the faculty members and students at this institute and shared about cultural differences and research similarities. The department chair of biotechnology, Dr. V. Krishna Murthy, was their host and arranged for them to visit a number of research institutes, hospitals and laboratories. This included the National Institute of Mental Health & Neurosciences (NIMHANS), the Foundation for Revitalization of Local Health Traditions (FRLHT), the PES College of Pharmacy and the Lotus Laboratories and Embiotic Labs.

These visits allowed the students to experience the use of native plants in the treatment of cancer, the production of pharmaceuticals and the richness of research being conducted in India.



India Travelers: Front Row, Left to Right: Kyle Swanier, Marie Dixon-Smith, Raven Byrd, Jameka Grigsby. Back RowL Sakeli Hall, Antrice Walker and Torquoise Alexander.

Three Bridge to the Doctorate Students are Honored at the National Women of Color (WOC) STEM Conference

At the Women of Color (WOC) Science, Technology, Engineering and Math (STEM) Conference, three Bridge to the Doctorate students were honored for their research and were featured in the October Issue of Women of Color Magazine*. The WOC STEM Conference celebrates the achievements of women of color and creates an environment for professional networking.

"By our getting the research experience already, we know how we can use our research for our PhDs and ultimately when we get into our careers," Malone says.

Anderson, who presented on behalf of the research group at the Advancing Minorities Interest in Engineering (AMIE) national conference held in September 2010 at Jackson State, says maintaining a vibrant campus social life remains vital for her as well as community service. Anderson and Peay also served as summer exchange students during 2010 at Shaanxi Normal University in Xi'an, China.

Additionally, Peay, a native of Baltimore and an all-conference collegiate golfer, spent time during 2007 and 2008 at the headquarters of athletic shoe and apparel manufacturer NIKE in Portland, OR, serving as



Ales-cia Malone, Antoinette Anderson and Nikeya Peay are LSMAMP Bridge to the Doctorate Fellows and computer engineering graduate students at Jackson State University. They are engaged with top-level laboratory research involving high performance reconfigurable computers. Each is expected to receive her master's degree in 2011 and then move directly into Ph.D programs.

an application engineer assisting in the development of prototypes for the NIKE Web site.

* - Source: the October Issue of Women of Color Magazine, downloaded at http://www.womenofcolor.net/ on January 7, 2011.

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Centdrika Dates, Jessica Davis and Baraka Williams, from the LSMAMP Bridge to the Doctorate program at Jackson State University were a part of a team from the State of Mississippi to visit Educational and Research Institutions in Belize, Central America. These students participated in the following: (1) Meeting with Administrators, Faculty and Students at University of Belize,

- (2) Visit to the Public Health Laboratory at Belize City
- (3) Visit to the Belize Agricultural Health Authority, Belize City
- (4) Citrus Research and Education Institute, Stann Creek District, Belize.

By participating in these meetings and visits, the students will help us evaluate the suitability/potential of short and long-term education and research collaborations in Belize.

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Louis Stokes Mississippi Alliance for Minority Participation

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Celebrating 18 Years of Increasing Minority Degrees in Science, Technology, Engineering and Mathematics



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L\$MAMP Senior Awards

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