

## LIGHTING the Path to OUR FUTURE

WITH  
**S**CIENCE,  
**T**ECHNOLOGY,  
**E**NGINEERING AND  
**M**ATHEMATICS

**LOUIS STOKES LOUISIANA ALLIANCE  
FOR MINORITY PARTICIPATION  
PARTNER INSTITUTIONS:**

Southern University and A&M College  
*(Lead Institution)*

Dillard University

Grambling State University

Louisiana State University

Louisiana Universities Marine Consortium

McNeese State University

Nunez Community College

Southern University at New Orleans

Southern University at Shreveport

Tulane University

University of Louisiana at Lafayette

University of New Orleans

Xavier University of Louisiana



## LOUIS STOKES ALLIANCES FOR MINORITY PARTICIPATION



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Program Director  
Louis Stokes Alliances for Minority Participation

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**LOUIS STOKES**  
**LOUISIANA ALLIANCE FOR**  
**MINORITY PARTICIPATION (LS-LAMP)**

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*The front cover photo features SUBR LS-LAMP Scholar Jonathan Goins, chief student marshall for the SUBR fall class of 2004.*



**MESSAGE FROM THE DIRECTOR** | DR. DIOLA BAGAYOKO,  
LS-LAMP PROJECT DIRECTOR

Dear Readers,

The Louis Stokes Louisiana Alliance for Minority Participation ([www.ls-lamp.org](http://www.ls-lamp.org)) is a statewide, comprehensive, systemic mentoring and institutional transformation program. Its central objective is to increase the number and quality of minority students earning Bachelor degrees in science, technology, engineering, and mathematics (STEM) disciplines. A second objective consists of guiding an increasing percentage of these minority BS degree holders to the successful pursuit of STEM graduate degrees, with emphasis on the Ph.D.

LS-LAMP is a project of the Louisiana Board of Regents. It is funded by the National Science Foundation (1995-2015) with substantial financial contributions from the Louisiana Board of Regents. Dr. Kerry Davidson, the Deputy Commissioner for Sponsored Programs, is one of the principal investigators of LS-LAMP. Southern University and A&M College in Baton Rouge (SUBR) serves as the lead institution of our Alliance .

This impact report, entitled "Lighting the Path to our Future with STEM," provides a summary of the accomplishments of LS-LAMP over the last 16 years. Its content shows that LS-LAMP has significantly contributed to the increase of both the number and the quality of minority students earning BS degrees in STEM fields. Several of these STEM alumni have earned or are pursuing STEM graduate degrees. This report establishes the attainment of these results with numerical data and graphs.

The adoption and implementation of the Ten-Strand Systemic Mentoring Model of LS-LAMP and of the Timbuktu Academy has significantly and positively affected the financial support and the academic, social, and professional integration of undergraduate Scholars on partner campuses. The institutionalization of our transformative, best practices is a major impact that is not easily quantifiable.

The contributions of LS-LAMP to the teaching, mentoring, and learning (TML) knowledge base are substantive. These impacts of LS-LAMP are expected to broaden in years to come. This report demonstrates the validation of our Ten-Strand Systemic Mentoring Model and of three of our publications by national studies, including two by the National Academies of Science in 2001 and 2011.

Thank you very much for your attention.

A handwritten signature in blue ink that reads "Diola Bagayoko".

Diola Bagayoko, Ph.D.  
LS-LAMP Project Director



## EXECUTIVE SUMMARY

The Louis Stokes Louisiana Alliance for Minority Participation (LS-LAMP) is a comprehensive, statewide, coordinated program aimed at substantially increasing the number and quality of minority students enrolling in and completing baccalaureate degrees in science, technology, engineering, and mathematics (STEM) and subsequently going on to pursue graduate studies in STEM disciplines. LS-LAMP consists of twelve (12) institutions and one research facility with Southern University and A&M College as the lead institution.

During the 16 years (1995-2011) of its operation, LS-LAMP has had a transformative impact on Louisiana STEM education overall and on minority STEM education in particular. This success was achieved through the adoption and institutionalization of the **10-Strand Systemic Mentoring Model** at all LS-LAMP partner institutions. The LS-LAMP Strategic Implementation Plan (SIP) (<http://www.phys.subr.edu/TA/ls-lamp/sip.pdf>) provides a clear, comprehensive and detailed roadmap for the achievement of the goals of LS-LAMP. Enhancement of institutional infrastructure, curriculum reform, institutionalization of LS-LAMP and the acquisition of external funding for the continuation of LS-LAMP beyond NSF support are additional accompanying activities.

### IMPACT OF LS-LAMP

The impact of LS-LAMP is wide-ranging and not limited to minority STEM education or to the LS-LAMP partner institutions. LS-LAMP has not only achieved the stated objective of increasing the number and the quality of under-represented minorities in STEM disciplines but has also succeeded in changing the culture of the educational operation in partner institutions. **In the past 16 years, LS-LAMP has developed a comprehensive and universally applicable model of systemic mentoring.** The LS-LAMP 10-Strand Systemic Mentoring Model has been validated in practice through the achievements of LS-LAMP as well as through peer-reviewed publications in educational research.

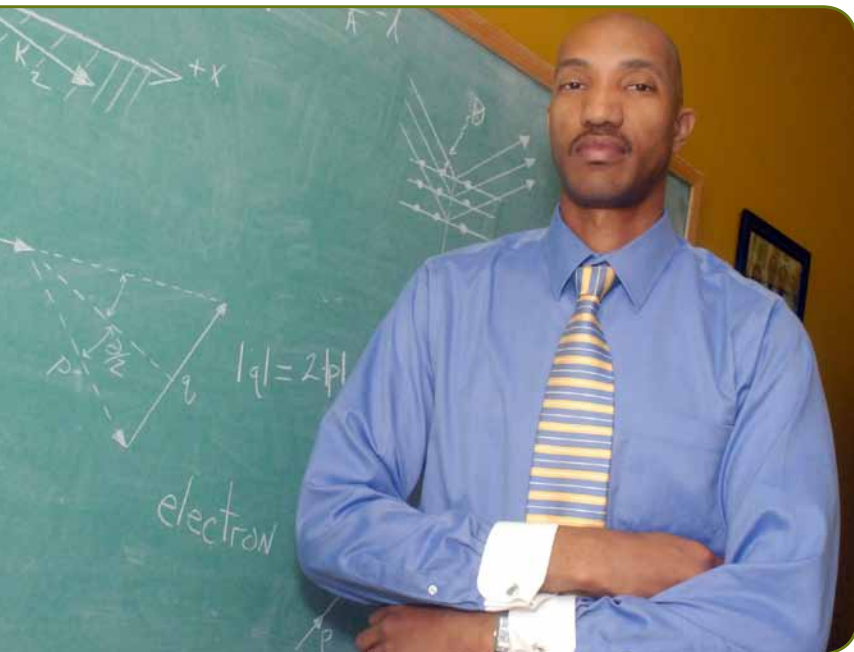
**STEM PH.D. DEGREES TO MINORITY ALUMNI OF LS-LAMP** | The most significant indicator of the impact of LS-LAMP is the number of STEM Ph.D. degrees awarded to minority STEM Baccalaureate degree graduates of LS-LAMP partner institutions. The number is a direct measure of the impact of LS-LAMP and an indicator of the increase in the quality of the minority STEM BS degree graduates from LS-LAMP institutions. **Since 2000, a total of 191 STEM Ph.D. degrees have been awarded to LS-LAMP alumni at an average of 17 Ph.D. degrees per year. This is three (3) Ph.D. degrees per year greater than the average (14 Ph.D. degrees per year) for the period 1996-1999.** The period 1996-1999 was the time when the first LS-LAMP scholars, admitted as freshmen, earned their BS degrees.

**STEM BACCALAUREATE DEGREES AWARDED TO LS-LAMP SCHOLARS** | **There was a steady increase in the annual minority STEM BS degree production from 507 degrees in 1996 with a leveling off at about 761 degrees per year in the period between 2001 and 2004.** The leveling off can be attributed in part to a) the state-mandated 300% increase in the out-of-state fee at all the institutions, b) the elimination of open admission at several of the LS-LAMP partner institutions, and c) the increase in admission requirements in several institutions that led to a significant drop in enrollment. We believe that the LS-LAMP systemic mentoring activities, including financial support, have in part mitigated the adverse effects of the factors listed above and helped to maintain the degree production at a relatively higher level. Hurricanes Katrina and Rita devastated five (5) LS-LAMP institutions in New Orleans and McNeese State University in Lake Charles, respectively. This resulted in a drop in degree production to a low of 515 degrees in 2010. **The 2011 LS-LAMP minority STEM degree production of 623 degrees is a clear indication of the post-Katrina recovery of the five New Orleans partner campuses and the continuing success of the other LS-LAMP partners.**

**FINANCIAL SUPPORT** | Supplemented by funding from state, industry and private sources, financial support was provided to students in the form of research stipends and book awards. As a result, the students were able to devote significantly more time to their studies by eliminating or reducing the amount of time spent on off-campus jobs since **LS-LAMP has awarded financial support to 8,785 undergraduate students pursuing STEM BS degrees.**

**RESEARCH PARTICIPATION** | At the undergraduate level, it is a critical and mandatory activity of LS-LAMP. It is the single largest cause of the significantly increased transition and success of LS-LAMP alumni to STEM graduate schools and their pursuit of graduate STEM degrees. Since 2000, a total of 2,417 undergraduate students have conducted summer research at universities, national labs and in industry through paid research internships.

**CONFERENCE PARTICIPATION** | This activity is a key factor in immersing scholars in a professional culture. LS-LAMP scholars attend conferences and present the results of their research. These presentations are the culmination of a series of steps designed to promote research and research oriented careers for LS-LAMP scholars. **Since 2000, a total of 2,928 LS-LAMP scholars have attended state and national conferences and made poster or oral presentations of their research findings.**



**GUIDANCE TO GRADUATE SCHOOL** | In addition to research experience and conference participation, all LS-LAMP scholars are expected to participate in activities such as GRE preparation, graduate school site visits, professional development through seminars/workshops, and the enhancement of computer and technological skills. All these activities contribute toward the preparation for a smooth transition to graduate school. Since 2000, more than 1,224 LS-LAMP scholars have transitioned to graduate school to pursue Masters or Ph.D. degrees in STEM. The Bridge to Doctorate is an LS-LAMP activity which provides financial support to LS-LAMP alumni from all over the country to pursue a Ph.D. in a STEM discipline at Louisiana State University, the LS-LAMP bridge institution. To date, 48 minority STEM graduate students have successfully participated in this activity.

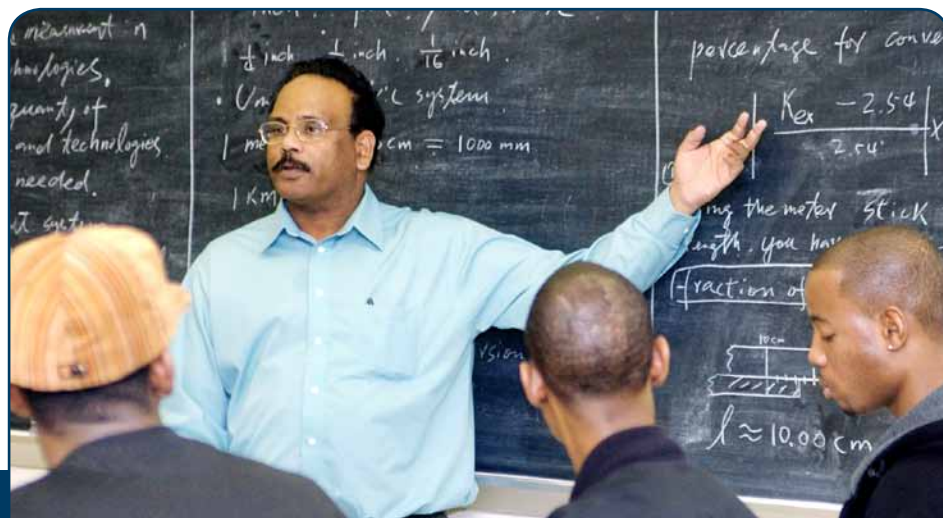
**GRANTS CATALYZED BY LS-LAMP** | A significant result of LS-LAMP activities was a quantum increase in external funding at LS-LAMP partner institutions. Grants equaling more than 28 million dollars were awarded to LS-LAMP partner institutions; they were catalyzed by LS-LAMP in one form or another.

**LS-LAMP IMPACT ON TEACHING, LEARNING, AND MENTORING (TLM) KNOWLEDGE BASE** | During the last 16 years, LS-LAMP has published more than 50 papers on systemic mentoring. Some of the major refereed publications pertaining to the basic tenets of teaching, mentoring, and learning have been validated by publications and reports by the National Academies of Science and the National Research Council.

The above results clearly demonstrate the significant positive impact of LS-LAMP on minority participation in STEM higher education which has occurred over the last 15 years in spite of the effect of natural disasters like hurricanes Katrina and Rita and other impediments.

From 1995-2011, LS-LAMP has had a transformative impact on Louisiana STEM education overall and on minority STEM education in particular. This success was achieved through the adoption and institutionalization of the 10-Strand Systemic Mentoring Model at all LS-LAMP partner institutions. The LS-LAMP Strategic Implementation Plan (SIP) (<http://www.phys.subr.edu/TA/ls-lamp/sip.pdf>) provides a clear, comprehensive and detailed roadmap for the achievement of the goals of LS-LAMP. Enhancement of institutional infrastructure, curriculum reform, institutionalization of LS-LAMP and the acquisition of external funding for the continuation of LS-LAMP beyond NSF support are additional accompanying activities.

The impact of LS-LAMP is wide-ranging and not limited to minority STEM education or to the LS-LAMP partner institutions. LS-LAMP has not only achieved the stated objective of increasing the number and the quality of under-represented minorities in STEM disciplines but has also succeeded in changing the culture of the educational operation in partner institutions. In the past 16 years, LS-LAMP has developed a comprehensive and universally applicable model of systemic mentoring. The LS-LAMP 10-Strand Systemic Mentoring Model has been validated in practice through the achievements of LS-LAMP as well as through peer-reviewed publications in educational research.



## INTRODUCTION

The **Louis Stokes Louisiana Alliance for Minority Participation (LS-LAMP)** is a comprehensive, statewide, coordinated program aimed at substantially increasing the number and quality of minority students enrolling in and completing baccalaureate degrees in science, technology, engineering, and mathematics (STEM) disciplines and subsequently going on to pursue graduate studies in STEM with emphasis on the Ph.D.

This Alliance is currently composed of twelve (12) institutions of higher education and the Louisiana Universities Marine Consortium (LUMCON), a research facility. The original alliance was joined by Xavier University in 2010-2011.

LS-LAMP is currently in the 17th year of its existence (1995-2011) and in Year 2 as a Senior-Level Alliance (2010-15).

The \$12.5 Million of NSF funding (1995-2010) has been supplemented with \$7.5 Million from the Louisiana Board of Regents. In addition, each partner campus has provided in-kind and cash matching costs equal to the LS-LAMP funding that it has received. As a result, an additional \$7.5 Million has been provided as campus cost share.

From 1995-2011, LS-LAMP has had a transformative impact on Louisiana STEM education overall and on minority STEM education in particular. This success was achieved through the adoption and institutionalization of the 10-Strand Systemic Mentoring Model at all LS-LAMP partner institutions. The LS-LAMP Strategic Implementation Plan (SIP) (<http://www.phys.subr.edu/TA/ls-lamp/sip.pdf>) provides a clear, comprehensive and detailed roadmap for the achievement of the goals of LS-LAMP. Enhancement of institutional infrastructure, curriculum reform, institutionalization of LS-LAMP and the acquisition of external funding for the continuation of LS-LAMP beyond NSF support are additional accompanying activities.

*\$12.5 million of NSF funding (1995-2010) has been supplemented with \$7.5 million from the Louisiana Board of Regents*

The impact of LS-LAMP is wide-ranging and not limited to minority STEM education or to the LS-LAMP partner institutions. LS-LAMP has not only achieved the stated objective of increasing the number and the quality of under-represented minorities in STEM disciplines but has also succeeded in changing the culture of the educational operation in partner institutions. In the past 16 years, LS-LAMP has developed a comprehensive and universally applicable model of systemic mentoring. The LS-LAMP 10-Strand Systemic Mentoring Model has been validated in practice through the achievements of LS-LAMP as well as through peer-reviewed publications in educational research.



## IMPACT OF LS-LAMP

### MINORITY STEM PH.D. DEGREES AWARDED TO LS-LAMP GRADUATES

The most significant performance indicator of the LS-LAMP impact is the number of STEM Ph.D. degrees awarded to minority STEM baccalaureate degree graduates of LS-LAMP partner institutions. The number is a direct measure of the impact of LS-LAMP and an indicator of the increase in the quality of the minority STEM BS degree graduates of LS-LAMP institutions who go on to pursue graduate degrees. An increase in the number of Ph.D. awards since the establishment of LS-LAMP would be a clear demonstration of the significant positive changes that are attributable to LS-LAMP systemic mentoring activities. **We are proud to state that 191 STEM Ph.D. degrees (an average of 17 per year) were awarded between 2000 and 2010 to minority STEM Bachelor degree graduates of LS-LAMP partner institutions**



Left to Right: Dr. Louis Stokes, Dillard LS-LAMP graduate Dr. Kelly Nash, and a program officer.

FIGURE 1

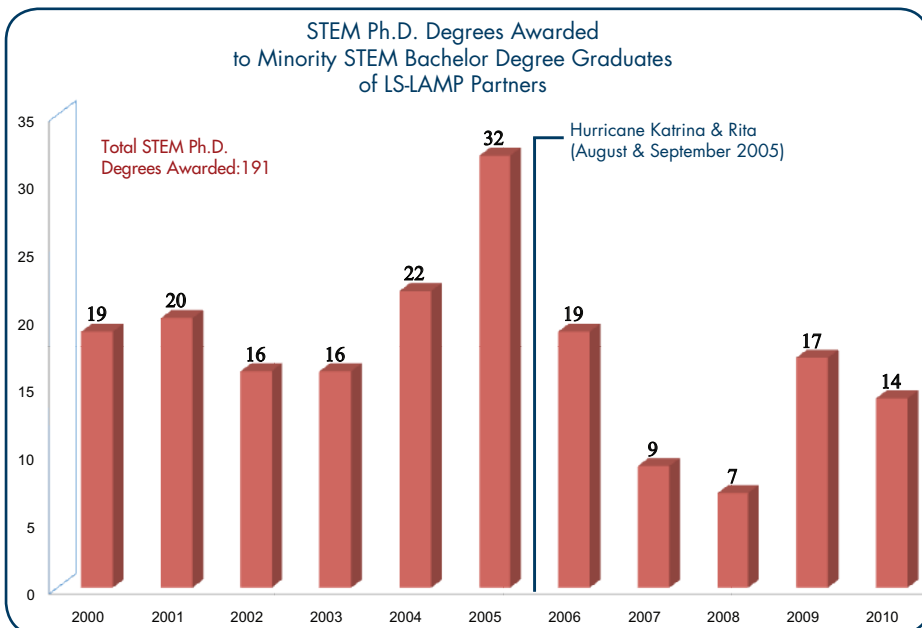
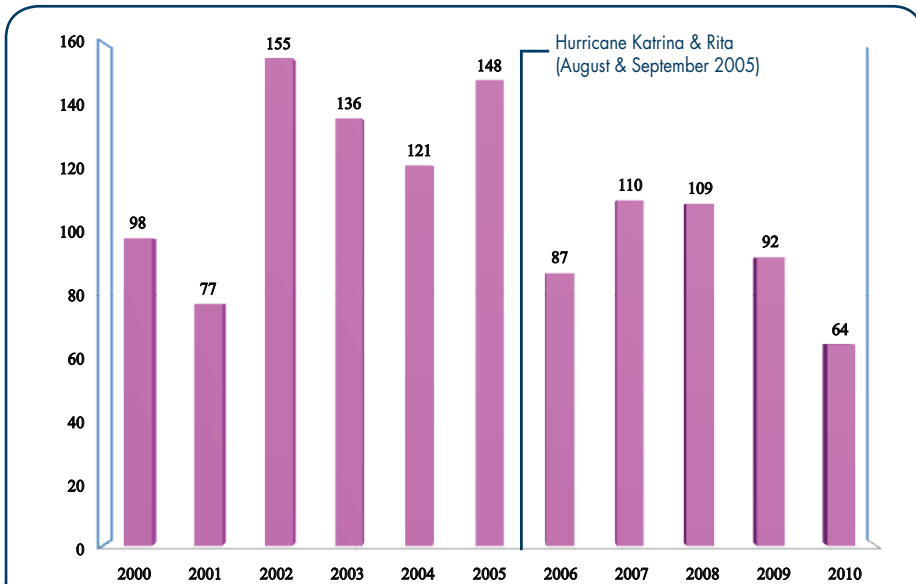


FIGURE 2 | Graduate Attendance (2000-2010)



(see Figure 1). Data from webcaspar.nsf.gov indicates that between 1996 and 1999, 58 graduates from the same (LS-LAMP) institutions were awarded STEM Ph.D. degrees (an average of 14 Ph.D. degrees per year). **This significant increase of three minority STEM Ph.D.s per year demonstrates the impact of the LS-LAMP 10-Strand Systemic Mentoring Model and of the special emphasis that LS-LAMP places on undergraduate research and guidance to graduate school.** The overwhelming majority of the Ph.D. recipients are former LS-LAMP Level 1 scholars who received research stipends, book awards and other forms of direct support from LS-LAMP.

Figure 2 shows the transition to STEM graduate schools by minority STEM graduates of LS-LAMP. The annual transition to graduate school rate has suffered to some extent due to the significant disruption to the five (5) LS-LAMP campuses caused by hurricane Katrina.

The increase in the award of Ph.D. degrees and the transition to STEM graduate schools is a direct manifestation of the special emphasis placed on undergraduate research available on campus and through a wide variety of opportunities such as the DOE-NSF Faculty and Student Teams (FaST), SULI, Committee on Institutional Cooperation (CIC) and other Research Experience for Undergraduates (REU) programs.

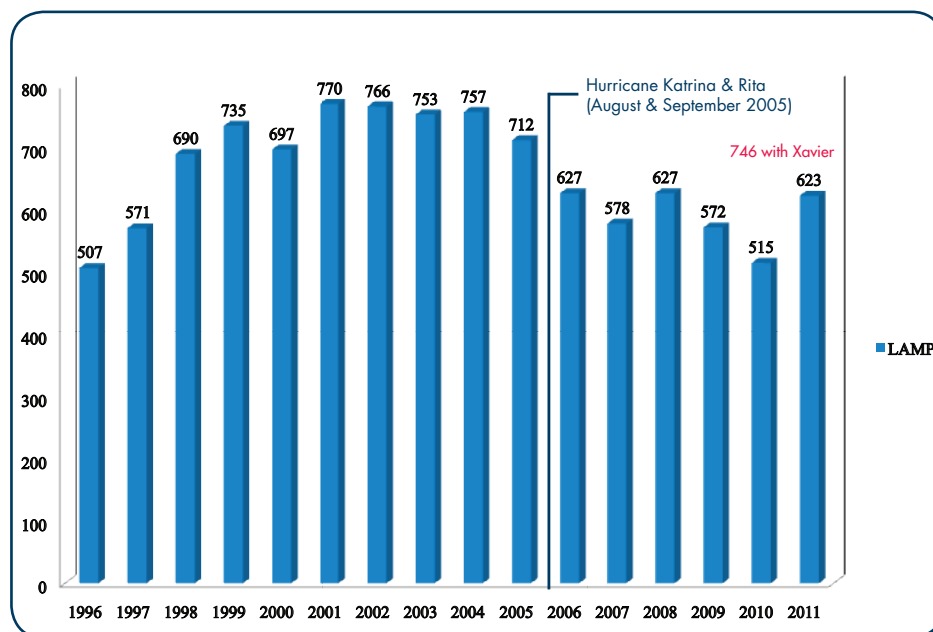


## UNDERGRADUATE STEM DEGREES AWARDED TO LS-LAMP SCHOLARS

The minority STEM BS degree production of the alliance is shown in **Figure 3**. There was a steady increase in the annual minority STEM BS degrees production from 507 degrees in 1996 and then a leveling off at about 761 degrees per year between 2001 and 2004. The leveling off can be attributed in part to a) the state-mandated 300% increase in the out-of-state tuition at all the institutions, 2) the elimination of open admission at several of the LS-LAMP partner institutions, and 3) the increase in admission requirements in several institutions that led to a significant drop in enrollment. We believe that the LS-LAMP systemic mentoring activities including financial support have in part mitigated the adverse effects of the factors listed above and helped to maintain the degree production at a relatively higher level. The 2010 LS-LAMP minority STEM degree production of 623 is a clear indication of the post-Katrina recovery of the five New Orleans partner campuses and the continuing success of other LS-LAMP partners. With the inclusion of Xavier University as part of LS-LAMP in (2010-11), the LS-LAMP minority STEM BS degree production has gone up to 746.



**FIGURE 3 | LS-LAMP Minority STEM BS Degrees (1996-2011)**



The devastation from hurricanes Katrina and Rita is the primary cause for the precipitous drop in the degree production after 2005. However, as described farther below, LS-LAMP activities provided significant assistance to the displaced students from five (5) LS-LAMP partner campuses that were shutdown when the entire New Orleans area was evacuated.

### LS-LAMP RESPONDS TO HURRICANE KATRINA

Hurricane Katrina, the sixth-strongest storm ever recorded, blasted through Louisiana, Mississippi and Alabama on August 29, 2005, and forever changed the face of the landscape and people's lives. Katrina devastated the New Orleans area levee system which was breached and the lake waters flooded the city. To add to the massive devastation and displacement from Hurricane Katrina, yet another storm, Hurricane Rita, struck southwestern Louisiana and southeastern Texas on September 24th.

All five (5) of the LS-LAMP partner institutions located in New Orleans were evacuated. Among the displaced students were two hundred and fifty (250) of the seven hundred and fifty Level 1 LS-LAMP Scholars. In the aftermath of Hurricane Katrina, professors and students from the New Orleans city universities took academic refuge in other schools. The LS-LAMP and Timbuktu Academy staff at Southern University Baton Rouge quickly mobilized to welcome and provide assistance to its displaced affiliates. The LS-LAMP office became the centralized administrative service area to scholars pursuing degrees in science, technology, engineering and mathematics (STEM) disciplines. Staff paid no attention to the clock but stayed as long as they were needed. Everyone—no matter what their job – pitched in to do the work that needed to be done. But work is really not quite the word to describe the caring and compassion that served as the hallmark of those incredible weeks immediately after the hurricane.

*After Hurricane Katrina, more than \$100,000 of assistance was provided to 145 displaced scholars*

LS-LAMP assisted over 150 displaced scholars. LS-LAMP staff members assisted displaced students who were trying to register to continue studies in other states and cities. Faculty members at SUBR and LSU guided students from SUNO and UNO through the curriculum selection to accommodate their plans of study. LS-LAMP also assisted them in the registration process and provided financial assistance in the form of book awards, stipends and housing. More than \$100,000 of assistance was provided to 145 displaced scholars. All possible efforts were made to ease the transition of displaced students in their new locations and to minimize the disruption to their studies in the aftermath of the hurricanes.

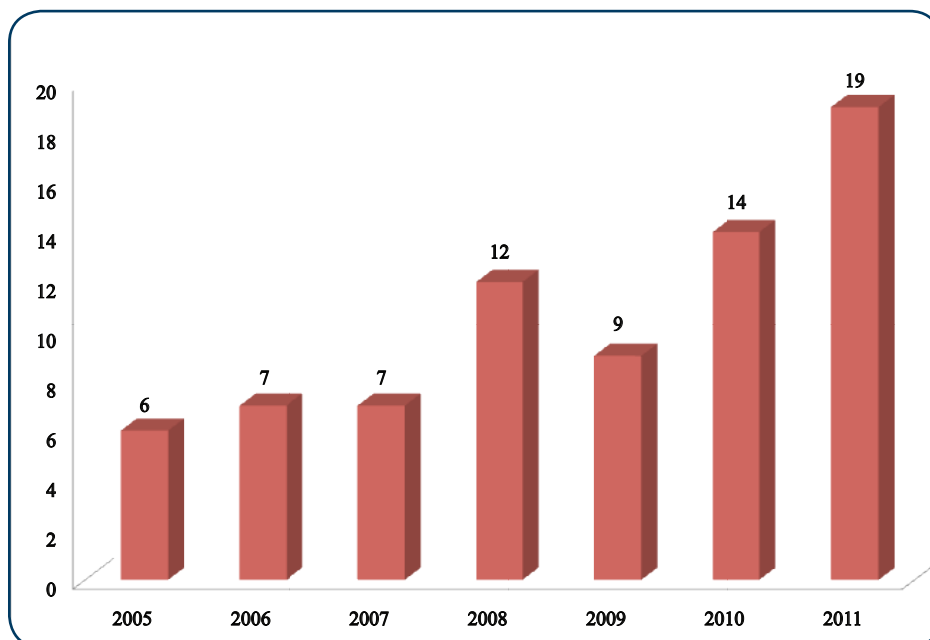
## UNDERGRADUATE RESEARCH AND ASSOCIATED ACTIVITIES

Undergraduate research is the major activity that undergirds the achievement of LS-LAMP goals. It is supported by the other systemic mentoring activities such as conference participation, enhancement of communication and technological skills, and the development of a professional culture. All LS-LAMP scholars are expected to participate in academic year and summer research. Up-to-date information regarding summer research opportunities is available on the LS-LAMP website ([www.ls-lamp.org](http://www.ls-lamp.org)) and the Timbuktu Academy website ([www.phys.subr.edu/timbuktu.htm](http://www.phys.subr.edu/timbuktu.htm)). All students participating in research are required to provide reports to their faculty research advisors and to present their research at state and national conferences. The figures below show the research and conference participation of LS-LAMP scholars between 2000 and 2010.

## LS-LAMP COMMUNITY COLLEGE TRANSFERS AND OUTREACH

LS-LAMP, from its inception, believed that community colleges would play an important role as feeder institutions of minorities to 4-year and graduate STEM degree programs. As a result, Southern University at Shreveport, Louisiana (SUSLA) and Nunez Community College (Nunez) were included as partners in the alliance. University of New Orleans (UNO), Grambling State University (GSU), Southern University and LSU became the main beneficiaries of the transfers from these community colleges to their STEM baccalaureate and graduate degree programs. With the establishment of the Louisiana Community and Technical College System, numerous 2-year institutions appeared in locations close to LS-LAMP partners. This made it possible for other alliance partners such as McNeese State University and Southern University at New Orleans to initiate college visits, tutoring, summer research workshops and other outreach activities to attract more community college transfers.

**FIGURE 4 | Community College Transfers from SUSLA and Nunez (2000 - 2010)**



The two community colleges in LS-LAMP have several agreements in the latter category. Nunez Community College presently has college articulation agreements with the University of New Orleans, Nicholls State University, Dillard University, University of Southern Mississippi, and Southeastern Louisiana University. It has one, in practice, with Southern University New Orleans. The two-year campus of Southern U. Shreveport has established agreements with SU Baton Rouge, Grambling, LSU Baton Rouge, LSU Shreveport, and SU New Orleans. An articulation agreement between Southern University-Baton Rouge and the Baton Rouge Community College (BRCC) enables BRCC graduates to join SUBR directly as juniors.

## THE LS-LAMP RIPPLE EFFECT

During the 16 years of its existence on partner campuses, the impact of LS-LAMP has permeated all corners of institutional operation. Many of the LS-LAMP activities have been expanded and new ones have been introduced. LS-LAMP has transformed the culture of the partner campuses through its emphasis on undergraduate research and vigorous pursuit of external funding.

## RESEARCH ACTIVITIES CATALYZED BY LS-LAMP

From its inception, LS-LAMP has made undergraduate research a major tool to achieve its goals of increasing the number and quality of minorities in STEM and supporting them in the pursuit of STEM graduate degrees. As a part of its activities to increase external funding at the campus level, LS-LAMP has provided information on new funding opportunities and conducted grant-writing workshops that have enabled faculty and students from all disciplines to increase the number and quality of grants submitted to federal and state agencies. Research grants have enabled faculty members to provide funded research opportunities to undergraduate students and to support student travel to state and national conferences to presenting their research findings.

## LS-LAMP - INSTITUTIONALIZATION

LS-LAMP institutions continue the process of institutionalizing, making permanent the LS-LAMP systemic mentoring activities. This enables them to improve and to expand LS-LAMP activities and to ensure LS-LAMP sustainability beyond NSF funding. A listing of these efforts is given below.

- a) Institutionalization of the LS-LAMP Campus Council comprised of departmental contacts, representatives of college deans, and of the vice-president for academic affairs, the office of admissions, institutional research, and financial aid. The Campus Council meets once or twice per semester to assess campus progress toward meeting LS-LAMP goals, and to address any deficiencies;
- b) SUSLA has developed an efficient tracking mechanism for students who transfer to senior colleges;
- c) Increased scholarship funding by the Louisiana Legislature for STEM students through the Tuition Opportunity Program;
- d) New support criteria for Board of Regents Support Fund awards that mandate undergraduate curriculum reform;
- e) Reducing the credit hour requirements to 120 at SUBR, thereby consolidating courses and decreasing the time to degree;
- f) SUBR allocated 25% release time for one faculty member in each of the 10 STEM departments. This faculty member is the designated LS-LAMP departmental mentoring coordinator who coordinates LS-LAMP systemic mentoring activities within the department;
- g) SUBR explicitly required mentoring (including student advisement) for Tenure and Promotion (T&P) starting in 2005 (Faculty Hand book 2005-07). Specifically, a faculty member must earn 60% of the points for mentoring to meet eligibility requirements for tenure and promotion;
- h) Resource supported mentoring efforts at SUNO, UNO, Tulane, Grambling, and Dillard;
- i) Resource support for the UNO Learning Center to complement gatekeeper course tutorial assistance;
- j) The institutionalization of a Systemic Planning Committee at Tulane University to monitor and address concerns of underrepresented minority STEM students;
- k) SUNO has established a fully staffed Math laboratory operated by student tutors and LS-LAMP scholars;
- l) McNeese STEM retention programs now enjoy recurring funding as a direct or indirect result of LS-LAMP, including University 101 which began as an LS-LAMP bridge program.;
- m) McNeese has recurring funding for a tutoring center, a testing center, and a writing center within the College of Science as a direct result of LS-LAMP activities; and
- n) McNeese provides funded research opportunities as a direct result of LS-LAMP activities.



## TEACHER PREPARATION

LS-LAMP has conducted two major teacher preparation programs – Teaching Scholars and MainSTey. NSF funded the Teaching Scholars programs in late 1996 for one year. LS-LAMP Teaching Scholars (TS) was a collaboration among three systemic mathematics and science reform projects jointly sponsored by the National Science Foundation and the Louisiana Board of Regents [Louisiana Collaborative for Excellence in the Preparation of Teachers (LaCEPT), the Louisiana Systemic Initiatives Program (LaSIP) and the Louisiana Alliance for Minority Participation (LS-LAMP)]. The Teaching Scholars program is based on the campuses of Grambling State University, Southern University-New Orleans, and Southern University-Baton Rouge. The program goals were:

- to increase the number of well-qualified, minority mathematics and science teachers in the state;
- to train additional teacher-leaders in standards-based mathematics or science education reform; and
- to increase the number of education program graduates receiving teaching certification.

Students were actively involved in the observation and practice of the teaching processes in classrooms of LaSIP-trained teachers in a school-based situation in order to receive active exposure to classroom mathematics or science teaching that models successful reform practices. LS-LAMP Teaching Scholars participated in the following activities during the academic year and the summer:

- Worked with a campus faculty mentor in LaCEPT sponsored, reform-based teaching or in the development of curricula and standards-based lessons that fit the curriculum framework;
- Developed leadership by delivering presentations at professional meetings or conferences that acquainted the Scholars with issues, principles, and successful techniques associated with standards-based teaching of mathematics and/or science; and
- Organized multimedia presentations and hands-on workshops for teachers and scholars to introduce new concepts and further enhance teaching skills in the following: reform teaching, inquiry, hands-on interactive approach; critical thinking and reasoning, self-discovery; NTE preparation, and utilization of technology in the classroom.

MainSTey was a Mathematics and Science-Technology Based Education/Industry Partnership between Texas Instruments Inc., the Mathematical Association of America, Louisiana Board of Regents and Southern University in 1998-1999. As a partner, Texas Instruments provided the equipment that utilized by the program participants. Each year, teams of 2-3 faculty participants from AMP institutions, participated in four different training activities which provided curriculum reform training to AMP faculty members who teach mathematics and science courses required of prospective mathematics and science education teachers. Every year, the cohort was responsible for producing a set of workbook activities for publication. Results to date:

- Cohort 1 (1996/97) 23 faculty participants from 9 institutions received training, which means that annually approximately 5,500 students will receive the benefit of their training in the classroom.
- Cohort 2 (1997/98) 26 faculty participants from 11 institutions received training through the MainSTey project. With this group, approximately 6,000 students will receive the benefit of their training.
- Cohort 3 (1997/98) 30 faculty participants from 12 institutions are currently receiving training through the project. Approximately 6,500 students will receive the benefit of their training.

*Seventy-nine faculty members from 32 institutions participated in MainSTey. More than 18,000 students would benefit from the MainSTey training received by the faculty.*

A professional quality workbook of calculator activities was completed and published in 2002.

## LS-LAMP IMPACTS ON THE TEACHING, MENTORING, AND LEARNING (TML) KNOWLEDGE BASE

Profound impacts of LS-LAMP that are far-reaching in space and time consist of its significant contributions to the teaching, mentoring, and learning (TML) knowledge base through publications. Indeed, from 1996 to present, we have made fifty (50) publications dealing with TML. Our annual reports contain most of these publications.

LS-LAMP and its sister program at SUBR, the Timbuktu Academy, have placed systemic mentoring on a rigorous, scientific basis. The most stable law of cognitive science, the power law of human performance, was utilized to demystify totally the process of knowledge and skills acquisition as well as that of developing research proficiency and productivity in any field. We cannot overemphasize this point, given the commonly held belief of many students, teachers, and parents in a deterministic relation between innate abilities and intellectual performance (in studies and research) – particularly among minority groups and others with a low socioeconomic status. The established relation between perceptions/emotions and motivations points to a highly inhibitive nature of this belief. It is also profoundly self-defeating for parents and students as well as teachers. We think that a summary of our work in this area could be greatly helpful to LS-AMP and other programs with similar objectives. The second publication below explains the power law of human performance.

Specific illustrations of the intellectual merit of some of our publications are provided below. The two publications below, along with others dealing with the Ten-Strand Systemic Mentoring Model of LS-LAMP and the Timbuktu Academy, have been validated by the contents of national publications including the 2005 Urban Institute Report on the Evaluation of LSAMP, nationwide, and the National Academies' 2011 publication entitled "Expanding Underrepresented Minority Participation: America's Science and Technology Talent at the Crossroads." [National Academies of Science, 2011]

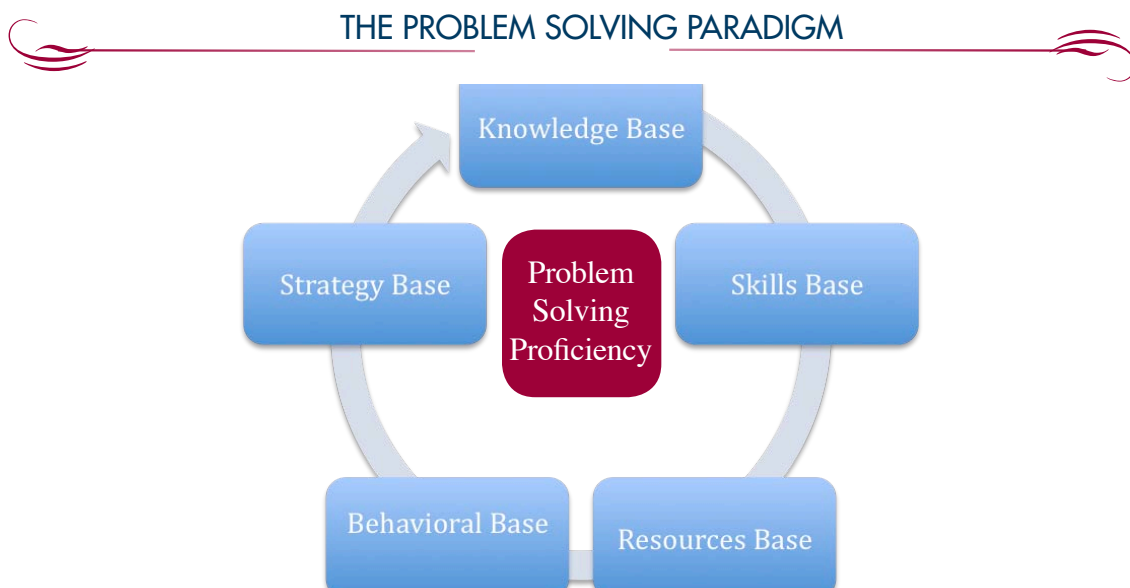
"Basic and Advanced Research Training for the New Millennium: the Model of the Timbuktu Academy." D. Bagayoko, R. Bobba, E. L. Kelley, and S. Hasan. Journal of Materials Education, Vol. 24 (1-3), Pages 177-184, 2002.

"The Philosophical Foundations of Systemic Mentoring at the Timbuktu Academy." D. Bagayoko. Science Next Wave, American Association for the Advancement of Science (AAAS). An online publication available at <http://nextwave.sciencemag.org/>, 2002.

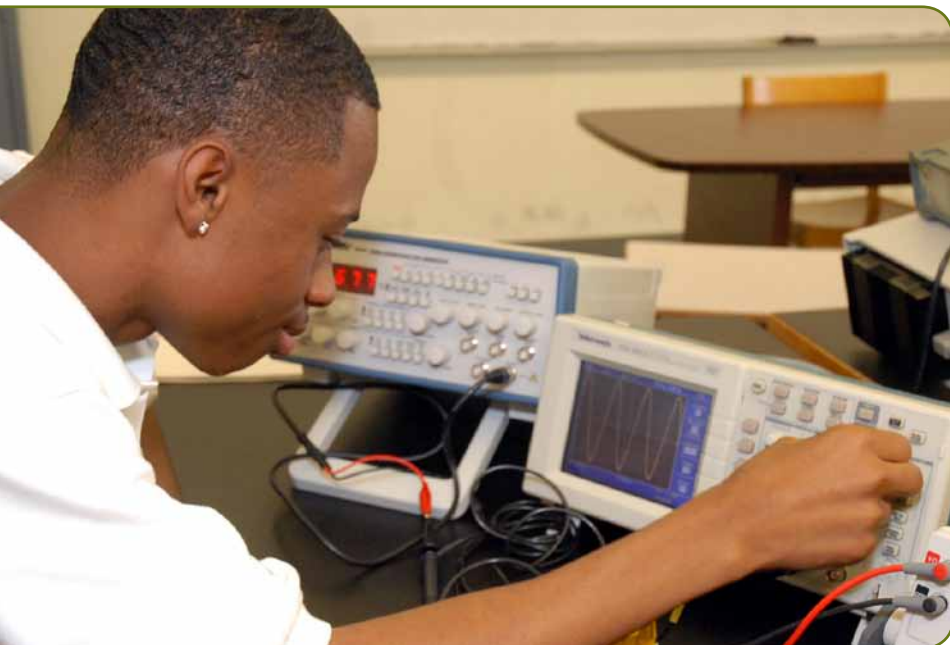
Specifically, the Urban Institute Report identified academic integration, social integration, financial support, and professional integration as summative constructs that portend not only student retention, but also progression, on-time graduation, and increased likelihood of graduate school attendance. The publications above, and other contributions of ours cited therein, made several years before the Urban Institute Report appeared, established this statement relative to these constructs in the report.

The National Academies' publication noted above provided a list of best-practices that support the academic and research success of college students [See Page 10 for desired or effective Program Characteristics]. In particular, every one of these characteristics is explicitly included in our systemic mentoring model. They are summer programs (for middle and high school students), research experiences, professional development activities, academic support and social integration, and mentoring. In fact, for minority students, the Ten-Strand Systemic Mentoring model is more coherent and comprehensive than the listing in the Academies' Report. Our review of precollege and college level standardized test scores showed that minority and low socioeconomic status students need explicit assistance with communication skills enhancement. Without this enhancement, the doors of many colleges and graduate schools will remain closed for them - due to very low verbal scores on these tests (standardized college and graduate admission tests). Under mentoring, the Academies' publication rightfully specifies providing undergraduate or graduate students with "information, advice, and guidance and support generally at critical decision points." These features are explicitly addressed in strands 1 (financial support), 3 (scientific advisement), and 10 (guidance to graduate school or to the job market).

Our 2000 refereed publication of a "Problem Solving Paradigm (PSP)" [College Teaching, Winter 2000, Vol. 48, No.1, Pages 24-27, 2000 - by Bagayoko, Kelley and Hasan] was totally confirmed or validated by the content of the 2001 publication of the National Academies of Science entitled "Adding It Up: Helping Children Learn Mathematics." Specifically, in 2000, we identified five (5) categories that are woven together to beget problem solving proficiency or expertise. They are declarative knowledge, procedural knowledge, behavioral temperament, strategy & experience, and resources. "Adding It Up," in 2001, identified conceptual understanding, procedural fluency, strategic competence, productive disposition, and adoptive reasoning as the five strands for mathematical proficiency. Except for adaptive reasoning, there is a one to one correspondence between these strands and the categories in our problem solving paradigm. As for adaptive reasoning, it is embedded into declarative knowledge, procedural knowledge, strategy and experience, and behavioral temperament for our problem solving paradigm that does have the critically important category of "resources" that is missing in the "Adding it Up." The importance of resources is mildly conveyed by that of learning materials, literature for research, equipment, etc. The paradigm applies to non academic and non research problems for some of which resources can be deterministic when other factors are comparable!



Even though we do not discuss it here in detail, we should note that our contribution to research on misconceptions in learning is expected to impact the field significantly. Indeed, before our work, studies on misconceptions could not distinguish between a lack of knowledge and a wrong concept or a misunderstanding (misconceptions). The introduction of the Certainty of Response Index (CRI) constitutes a straightforward method for distinguishing between a lack of knowledge and a misconception. Further, the ease with which this method can be implemented in the classroom adds to its potential broader impacts. ["Misconceptions and the Certainty of Response Index (CRI)," S. Hasan, D. Bagayoko, and E Kelley, Phys. Educ. 34(5) September 1999.]



We have made over 350 presentations on the teaching, mentoring, and learning, with emphasis on the law of human performance and the Ten-Strand Systemic Mentoring model.

## THE LS-LAMP 10-STRAND SYSTEMIC MENTORING MODEL

Systemic mentoring entails a weaving of the following “overlapping” strands.

*[The implementation of this model earned the Timbuktu Academy the 2002 US Presidential Award for Excellence in STEM mentoring]*

a full time basis. The diversified funding base for the scholars include tuition scholarships (TOPS in Louisiana), the Federal Student Financial Aid, limited support from LS-LAMP, LASIGMA, and other scholarship and fellowship sources, including unit and institutional funds.

2. **Communication skill enhancement** - A host of listening, speaking, reading, writing and related activities are aimed at developing the mastery of the applicable language (English), a vehicle of thought. This activity entails vigorous exposure to technical communication as provided for in “Writing for Success” (1998, McGraw-Hill Companies, pp. 135-176 and pp. 212-215), beyond regular English course work.

3. **Comprehensive, Scientific Advisement** - The proper sequencing of courses is treated with the utmost care. Indeed, the internal rigidity (or taxonomic structure) of science, technology, engineering, mathematics (STEM) disciplines requires this approach. Empowering the learner is a central aim of mentoring. This empowerment includes grasping the power law of performance and its extension, the integrated law of human performance (ILP); and knowing a few time-tested facts and practices (first-time memory retention curve, the value of effective study groups, a problem solving paradigm, the difference between lacking a background material and not being “smart.”)

4. **Tutoring** - Tutoring by faculty members and particularly by peers will continue to be available to the students or scholars who need it. (In fact, regular tutoring areas are often taken over by self-organized study groups!) Tutoring is for excellence, not for remediation; it is to address holes in a background and to reinforce known essentials; the need for it is not a sign of any lack of intrinsic smartness, so says the power law of human performance, but rather a wise recognition of the internal rigidity of STEM fields. Incidentally, tutoring by advanced scholars also promotes their communication skills and their sense of self-worth while they review materials (so says the ILP)!

5. **Generic research activities** - Rigorous literature searches are conducted by the scholars on several subjects. They master sophisticated search algorithms, electronic searches, and related iterations. The scientific literature is an unlimited source of research questions! Refereed literature is the standard for STEM disciplines. Discussions of the fine structures of the scientific method, critical thinking, and of creative thinking are part of this discourse.

6. **Specific research project execution by the scholars in our mentoring programs** - Faculty members and researchers at federal and industrial laboratories serve as research supervisors and mentors during the summer. According to the integrated law of human performance, research experiences should prepare for graduate studies and for productive research careers. Seeking summer research opportunities on-line, at conferences, and through visits to various laboratories and agencies is one requirement for a mentoring program. Assisting scholars to apply vigorously and professionally for these opportunities and maintaining adequate files on each scholar, partly for the purpose of writing substantial (as opposed to general and vague) recommendations, are some tasks for mentors to accomplish.

7. **Development of a professional culture** - Every scholar is exposed to discussions that explore the dimensions of ethics in science. Immersion in a professional culture demands regular reading of technical journals and appropriate magazines of professional societies, conference attendance, and collaboration with others. Current awareness needs no explanation in an era of information explosion. Professional practices and standards are set and seen in publications, regular (weekly) seminars, and at conferences. As for the need for

and value of collaboration, we simply assert that not one individual has built or operated a nuclear submarine, an aircraft carrier, or a space shuttle alone!

8. **Development of Computer and Technological Skills** - The mastery of productivity tools, including word-processing, spreadsheets, database, graphics, other applications, and scientific programming (C++, FORTRAN, etc.) are needed. Electronic communication and productive surfing of the web are needed by the middle of the first semester. Advanced exposure has to include a programming language. (The need for these activities stems from practices in the environments to which the students are destined, i.e., graduate schools and the global, competitive market).

9. **Monitoring** -facilitated by the mentoring portfolios of scholars. Without this portfolio, a mentoring cannot be comprehensive or systemic as we know understand it. With monitoring, throughout the semester, potential problems are avoided before they become permanent Fs. Preventive measures include concentrated efforts, extra-tutoring, and the last resort, dropping a course. The former two steps are best when they are taken as early as possible. The latter step is not an available option past a certain date after mid-term! The monitoring of research participation and performance is critical for another reason: the development or reinforcement of non-cognitive skills that undergird success (self-discipline, hard work, assiduity, working well with others, etc.). Monitoring and evaluation are part of a professional environment, without them, who will know what a beautiful job a scholar has done!

10. **Guidance to Graduate School** - It begins in the freshman year (or earlier) and includes research experiences, conference attendance, GRE preparation starting the freshman year, and opportunities for financial support for graduate studies! Placement in graduate programs follows steps similar to those for summer placement. The number and the extent of the opportunities depend on the cumulative grade point average for the BS degree, the courses taken, research experiences and results, and the GRE score. In addition, graduate preparation will include an understanding of the non-academic factors that are critical to success in graduate school (study habits, self-discipline, hard work, etc.). Emphasis will be placed on the establishment of a seamless transition to graduate schools.

*The LS-LAMP Strategic Implementation Plan (SIP) embodies every one of the 10 systemic mentoring strands described above.*



## LS-LAMP STRATEGIC IMPLEMENTATION PLAN

The LS-LAMP Strategic Implementation Plan was developed in 2000. It was based on our experiences in Phase I. It provides a clear, comprehensive and detailed roadmap for the achievement of the goals of LS-LAMP. Its sub-objectives and action steps address individually recruitment, systemic mentoring, retention, graduate school attendance, enhancement of institutional infrastructure, curriculum reform, institutionalization of LS-LAMP and acquisition of external funding for the continuation of LS-LAMP beyond NSF support. Achievement of the above objectives is a fail-safe means of attaining the LS-LAMP goals of increasing minority participation in STEM disciplines and success in graduate school. In addition to the annual budget, each LS-LAMP campus is required to submit an annual strategic implementation plan that provides specific details of the activities that will be conducted in order to achieve the LS-LAMP goals for the given year.

**Subobjectives 1.5-1.7 of the LS-LAMP Strategic Implementation Plan (SIP) is below.**

The complete LS-LAMP SIP is available on the web at [www.ls-lamp.org](http://www.ls-lamp.org).

<b>Subobjective</b>	<b>Action Steps</b>	<b>Owners</b>
<b>1.5</b> <b>To introduce students to research tools and methods</b>	1.5.1 Introduce students to research faculty	Campuses
	1.5.2 Make research involvement part of campus programs	Campuses
	1.5.3 Have students write up and publish research findings at student conferences	Campuses
	1.5.4 Require students to write summaries of research seminars they attend	Campuses
	1.5.5 Disseminate information on research activities	LS-LAMP Campus Staff
<b>1.6</b> <b>To involve LS-LAMP students in hands on research</b>	1.6.1 Mandate and secure student participation in research (NSF requirement)	Campuses
	1.6.2 Place students in summer and academic year internships	Campuses
<b>1.7</b> <b>To strengthen students' professional skills</b>	1.7.1 Encourage membership and participation in STEM discipline-specific organizations	Campuses
	1.7.2 Involve students in professional conferences/meetings	Campuses
	1.7.3 Have students make research presentations (local/state/regional/national)	Campuses
	1.7.4 Implement Shadow Day opportunities	Campuses
	1.7.5 Implement alumni mentoring	Campuses



## ECONOMIC IMPACT OF LS-LAMP

### Dimensions of the Economic Impacts of LS-LAMP

The economic impact of the Louis Stokes Louisiana Alliance for Minority Participation (LS-LAMP) has dimensions that do not fit into classic definitions.

#### Impact on Human Capital Development

One key reason for the above statement consists of the previous and continuing achievements of LS-LAMP in the production of minority science, technology, engineering, and mathematics (STEM) BS degree holders, on the one hand, and the pursuit of graduate STEM degrees, with emphasis on the Ph.D., by a significant percentage of these alumni. The contributions of the highly trained, technical workforce, for decades to come, constitute a singularly important

economic impact. The increasing proportion of minorities in the US population underscores the fact that expanding their participation in the STEM enterprise of this country is not only vital for economic growth and competitiveness, but also for national security.

#### Impact on Knowledge Capital

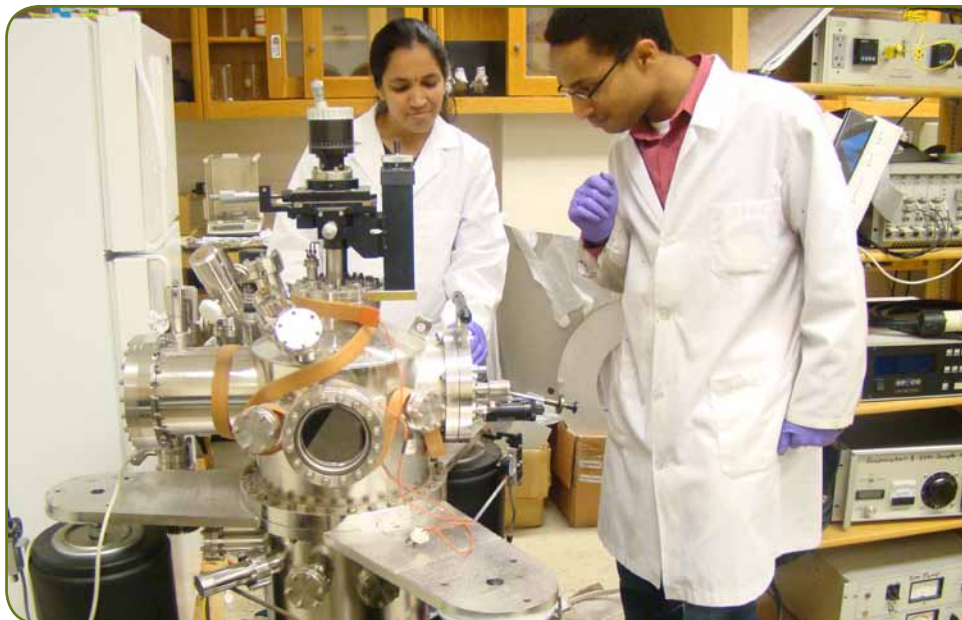
For the last 16 years, LS-LAMP has been contributing significantly to the body of knowledge in selected STEM fields and in teaching, mentoring, and learning (TML). In particular, the Ten-Strand Systemic Mentoring model of LS-LAMP and the Timbuktu Academy has been validated, as explained elsewhere in this report, by the content of the very recent publication of the National Academy of Science (NAS) on Expanding Minority Participation in STEM (NAS, 2011). Similarly, the content of the 2001 report of the NAS entitled "Adding it up: Helping Children Learn Mathematics" validated our 2000 publication of a Problem Solving Paradigm. Our work on misconceptions in teaching and learning introduced the Certainty of Response Index in misconceptions studies. In doing so, it provided, for the first time, a clear means for distinguishing actual misconception from a lack of concept or of knowledge.

Of a singular importance has been our introduction, in 1998-99, of the Bagayoko, Zhao, and Williams method that ushers in, for the first time, an era of ab-initio, predictive calculations of electronic, structural, optical, transport, and related properties of materials. Hence, it places theory in position to inform and to guide the design and fabrication of novel materials, with desired properties, and of semiconductor based devices. Implications of this work are simply stupendous, in terms of molecular and band gap engineering, in addition to significantly enhancing fundamental understanding in condensed matter theory.

One could easily neglect the very long term contributions of LS-LAMP alumni who have or will get research degrees to the STEM knowledge base. We submit that some of these alumni have already made names for themselves in STEM research and related publications.

#### Impact on the Diversification of the Funding Base

NSF funding has not only been utilized to support campus activities but also leveraged to bring in more external funding to expand and to develop new LS-LAMP activities. A significant effectiveness measure is the number of new grants and resources that are catalyzed by and result from LS-LAMP. An estimate of grants confirmed that during the 16 years of LS-LAMP operation, the campuses received more than \$46.7 million of external funding directly catalyzed by LS-LAMP. The grants included in this total are primarily major awards such as HBCU-UP (multiple awards), Science Talent Expansion Project (STEP), Bridge to the Doctorate (multiple awards), Research Initiatives for Minority Institutions (RIMI), and others. The Louisiana Board of Regents has continued to fund the alliance at the level of \$500,000 per year since the inception of LS-LAMP. **The NSF investment of \$13 million over 16 years has catalyzed external funding of \$46.7 million. LS-LAMP has catalyzed \$3.60 of external funding for every dollar of NSF funds invested in the alliance.**

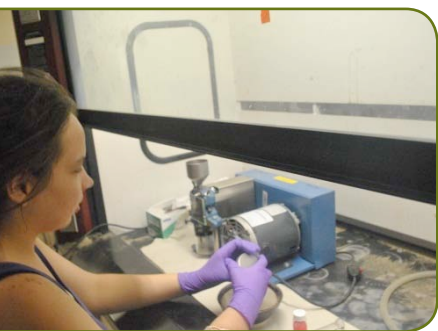


LS-LAMP has catalyzed \$3.60 of external funding for every dollar of NSF funds invested in the alliance.

## COMMUNITY COLLEGE INTERACTIONS & PARTNERSHIPS

From its inception, LS-LAMP has understood the importance of community colleges and their vital role as feeder institutions for four-year colleges and university STEM programs. LS-LAMP partner institutions have worked diligently to establish viable programs to seamlessly facilitate the transfer from community colleges to four-year college/university STEM programs.

**University of Louisiana at Lafayette |** The Enrollment Management Division at the University of Louisiana at Lafayette has initiated a collaborative partnership with South Louisiana Community College (SLCC). The goal of this partnership will allow the students from SLCC to utilize university services and resources. Although in the formative stages of the partnership, both institutions understand the long-term benefits that the partnership will yield in terms of successfully transferring associate degreed students to ULL. Students who be served through this partnership will have access to ULL's tutorial services and ULL's LS-LAMP resources.



**University of New Orleans |** Summer 2010, UNO offered a week-long problem solving activity for community college students needing enrichment in algebra, trigonometry and algebra-based physics. UNO also hosted eight community college students (five from Nunez Community College and three from Delgado Community College) to participate in a short pre-college experience. The majority of the participants were general science majors at Nunez and Delgado. To date, three of the five program participants have transferred to four-year colleges. Two students transferred to UNO and one transferred to Nichols State.



**Southern University and A&M College |** SUBR has participated in a number of community college outreach activities including Baton Rouge Community College (BRCC) Recruitment Days held April 2, 2008 and March 18, 2009. During the fair, 114 students showed interest in applying to SUBR, the LS-LAMP Program and the Timbuktu Academy. SUBR LS-LAMP also participated in Southern University's Fall 2010 and Spring 2011 "College Night on the Bluff" events, which allowed high school juniors, seniors and their parents to visit the campus and receive information on college entrance requirements, financial aid and courses of study. The program also distributed LS-LAMP program information during Baton Rouge Community College's Fourth Annual Science, Technology, Engineering and Mathematics (STEM) Career Expo on Wednesday, February 9, 2011.



LS-LAMP Program Director Diola Bagayoko hosted a special recruitment session for students and school officials from the Hillsborough Community College Reach Out Program in Tampa, Florida on Tuesday, April 27, 2011. The session was held in the High Tech Classroom of the Pinchback Engineering Building on the campus of Southern University.



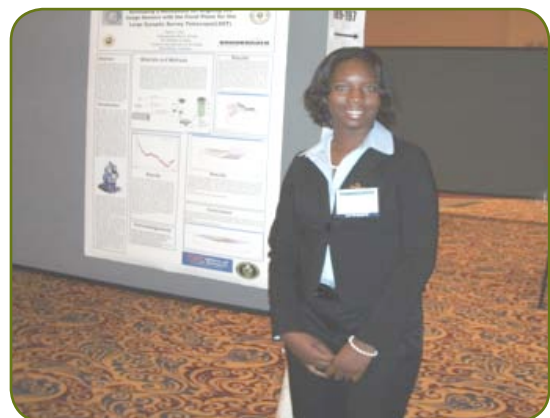
**Louisiana State University |** A component of LSU's HHMI Professors Program includes a partnership with Baton Rouge Community College (BRCC). Within this component, LSU has developed a transition model to increase students' success upon their transfer to four-year universities. A rigorous selection process was conducted with the aid of several faculty members from BRCC as well as staff from the LSU Office of Strategic Initiatives. During the Spring of 2011, LSU completed a successful selection of five new students for entry into the LSU / HHMI Professors Program at Baton Rouge Community College and facilitated the placement of these bright, young scientists into laboratory settings for LSU's Summer Research Experience. The selected students received tuition assistance and other support while participating in the summer program.



## ANNUAL RESEARCH CONFERENCES &amp; PRESENTATIONS



John Shu presents "Illustration on Longitudinal and Transverse Waves" during weekly Timbuktu Academy and LS-LAMP seminar.



LS-LAMP/ Timbuktu Academy Scholar Zephra Bell presents "Developing Focal Plane Alignment Mechanisms for the Large Synoptic Survey Telescope" at the 2009 HBCU-UP National Research Conference in Washington, D.C.



18th Annual Science and Engineering Alliance (SEA) Student Technical Conference, Gaithersburg, MD, October 8-10, 2008. L to R: Janaé Miller, LS-LAMP Scholar; Deirdra Boley, Timbuktu Academy Scholar; Michelle Millican Hammond, Former Timbuktu Academy Scholar; Alrica Joe, LS-LAMP Graduate and Research Recruiter; and Frank Alexander, Timbuktu Academy Scholar.

## INTERNATIONAL RESEARCH

- As part of Southern University's HBCU-UP Achieving Competitive Excellence (ACE) Implementation Project and the International Science and Education (ISE) Project, seven undergraduate and graduate students from Southern University travelled to China in May 2011. The students were Ryan Mallery, mechanical engineering major; Denita Walker, civil engineering major; Robert Chambers, urban forestry Ph.D. student; Brian Mims, urban forestry graduate student; Antwon Wooten, mechanical engineering major; Devin Carls, mechanical engineering major; and Chelsea Janice an urban forestry graduate student. This two-week research experience afforded students the opportunity to visit Beijing, Nanning, and Guiyang and engage in several sustainable energy research activities including studying the ecosystems of the DeTain Waterfalls in Nanning and the Huangguoshu PuBu and Tianxing Qiao in Guiyang. The students were accompanied by several SU administrators.

- In 2010, SUBR LS-LAMP Scholar Erin Rogers was among several students selected to participate in the Tropical Pathology and Infectious Disease Association TM, Inc. medical internship in the jungles of Peru and Hospital Iquitos in Peru. During this internship, Rogers treated natives of Peru for HIV, STDs and other tropical diseases.

- In December of 2009, eight students and administrators from Southern University's HBCU-UP Program travelled to China to establish relationships with business leaders at four companies in energy conservation. It was reported that these Chinese executives were so impressed with the students that they all left China with job offers. This trip served as a mechanism to build collaborative relationships between officials in China and Southern University.



- University of Louisiana at Lafayette Scholar Eric Decuir was a visiting researcher at the University of Paderborn in Germany. Decuir participated in epitaxial growth of cubic III-nitrides heterostructures (c-AlGaIn/c-GaN) utilizing a riber 32 MBE growth system.

## BRIDGE TO THE DOCTORATE



### LOUIS STOKES LOUISIANA ALLIANCE FOR MINORITY PARTICIPATION

The Louis Stokes Louisiana Alliance for Minority Participation (LS-LAMP) Bridge to the Doctorate (BD) is an activity of LSAMP. Louisiana State University (LSU) serves as the doctoral institution for the Bridge to Doctorate of LS-LAMP. By leveraging funds from its Office of Strategic Initiatives, BD scholars are insured four years of continuous support at the graduate level. The project is a direct and logical extension of LS-LAMP whose primary goal is to increase the participation of under-representative minorities in STEM disciplines and to ease the transition of these graduates into graduate school. The activity is an implementation and institutionalization of the 10-Strand Systemic Model of LS-LAMP at the graduate level. As of 2011, 48 graduate students have successfully participated in this activity.

To date, seven doctoral degrees have been conferred to participants of LS-LAMP BD. Two of the BD Ph.D. students currently have faculty positions; three have post-doctoral positions; and the remaining are employed in various STEM research and educational positions. The list of LS-LAMP BD scholars who have earned a STEM Ph.D. is given below.

LS-LAMP Scholar Name	LS-AMP Undergraduate Institution	Graduate Degree/Discipline	Graduation Date
Ursula White+	Louisiana State University	Ph.D., Biological Sciences	August 2009
Wakeel Idewu*	University of Louisiana at Lafayette	Ph.D., Civil Engineering	May 2009
Raphyel Rosby+	Louisiana State University	Ph.D., Biological Sciences	May 2010
Latoya T. Paul+	Southern University and A&M College	Ph.D., Biological Sciences	May 2010
Adeyaba Abera	Virginia Polytechnic Institute and State University	Ph.D., Electrical Engineering	December 2010
Monica Sylvain*	Howard University	Ph.D., Chemistry	December 2010
Kandace Thomas	Southern University and A&M College	Ph.D., Chemistry	December 2010

\* BD Scholars currently in faculty positions, + BD Scholars with postdoctoral positions.





## DILLARD UNIVERSITY | NEW ORLEANS, LA

### Positively Impacting STEM Research in the 'BIG Easy'

*Abdalla Darwish, Ph.D., Campus Coordinator*

Dillard University (DU) LS-LAMP is the only recruitment program for all STEM departments in their Division of National Sciences. Resources from LS-LAMP are used to facilitate the implementation of instructional and academic support services for LS-LAMP students to increase the preparedness of these students for graduate studies. The STEM Learning Center exists because of LS-LAMP. Moreover, this has also resulted in increasing the number of Dillard graduates who go on to pursue STEM graduate degrees.

Dillard has established a Center for Teaching and Academic Excellence through the Mellon Foundation. This center will provide faculty with encouragement and support and will facilitate faculty release time. Abdalla Darwish, Ph.D., is a co-director of this initiative and it will ensure the systemic replication of the academic excellence fostered by LS-LAMP throughout the University. An improvement of Dillard's STEM infrastructure with major equipment acquisitions has continued under Darwish's leadership. Dillard's LS-LAMP program has been instrumental in the institutionalization of systemic mentoring for all entering freshmen.

Dillard has also experienced an increase in faculty grant writing. The importance of grant writing is now reflected in the DU faculty handbook. Dillard University has incorporated external funding awards into its formula for merit pay. Since the implementation of this measure, the number of DU faculty grant submissions has increased.



## DILLARD UNIVERSITY | STUDENT PROFILES



**NAME:** KIM MICHELLE LEWIS, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Physics, Dillard University*

*M.S., Electrical Engineering, University of Michigan,  
Ann Arbor, MI*

*Ph.D., Applied Physics, University of Michigan, Ann Arbor, MI*

Kim Michelle Lewis, assistant professor of physics at Rensselaer Polytechnic Institute, has an extensive list of research accomplishments including a \$10,000 National Nanotechnology Infrastructure Network Fellowship, \$7,000 Rensselaer RAMP-IP Campaign Award and a number of other prestigious awards and achievements.

"The LS-LAMP program gave me the confidence that I needed to pursue advance degrees," says Lewis. "...the program increased my visibility in my profession and helped me to acquire additional fellowships and awards."

In addition to her Dillard research experiences, Lewis also participated in a number of research projects at other universities and national labs including Louisiana State University, University of Michigan and Argonne National Laboratory.

"The undergraduate research opportunities set me apart from other undergraduates applying for graduate school," says Lewis. "This gave me a competitive edge and it helped me to be more focused on my research goals as a graduate student."

**NAME:** KELLY L. NASH, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Physics and Mathematics,  
Dillard University, New Orleans, LA*

*M.S., Applied Physics,  
University of Michigan, Ann Arbor, MI*

*Ph.D., Physics, University of Texas  
at San Antonio, San Antonio, TX*



Kelly L. Nash credits LS-LAMP's individualized mentoring program for her professional success. Her mentorship experience has also motivated her to be a mentor and help students on their path to academic success.

"I often find myself contacting my LS-LAMP mentors for advice and I can still count on the same level of enthusiasm and encouragement that I received from them as an undergraduate student," says Nash.

While at Dillard, Nash was given the opportunity to participate in a number of research activities including Applied Nuclear Magnetic Resonance Spectroscopy Techniques, which are techniques used to evaluate pollution levels in Lake Ponchartrain. Nash was also an undergraduate research assistant at the REU/Summer Research Opportunity Program at the University of Michigan. She has also participated in research experiences at the REU/Data Systems Center (DSSC) in Pittsburgh, Pennsylvania and the Summer Research Experience Program at the University of Iowa, Iowa City, Iowa.

In planning for her graduate studies, Nash was accepted to four out of the five graduate schools to which she applied. Her research experiences gave her an edge on the competition to be accepted to an exceptional graduate program.

Currently, Nash is an assistant professor of physics at the University of San Antonio.



## GRAMBLING STATE UNIVERSITY | GRAMBLING, LA TAKING STEM EDUCATION TO THE NEXT LEVEL IN NORTH LOUISIANA

*Pia Albuquerque, Ph.D., and Olusegun Adeyemi, Ph.D., Campus Coordinators*

Grambling State University (GSU) continues to expand and to reinforce systemic mentoring infrastructure and LS-LAMP activities. LS-LAMP students participate in academic year and summer research in Faculty and Student Teams (FaST) programs. The faculty at Grambling LS-LAMP conducts GRE workshops as one of the activities for preparing its students for graduate school. LS-LAMP funding is utilized to provide book awards and CADET awards to minimize off campus employment and allow the students more time to devote to academics.

## GRAMBLING STATE UNIVERSITY | STUDENT PROFILES



**NAME:** WENDELL GRIFFITH, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Chemistry, Grambling State University*

*Ph.D., University of Massachusetts*

*Postdoctoral Studies, Johns Hopkins University*

Wendell Griffith has journeyed a long way from the red clay of Grambling, Louisiana where he started as a Grambling State University LS-LAMP scholar. Currently, Griffith is an assistant professor at the University of Toledo in Toledo, Ohio. His research interest is in applications of mass spectrometry to understand the structure/function relationships of proteins of clinical and biomolecules. Griffith hopes that his research will exploit the knowledge gained from these protein systems in order to improve the quality of human life.

**NAME:** MELVINIA MARTIN, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Biological Sciences, Grambling State University*

*M.S., Toxicology, Tulane University*

*Ph.D., Molecular & Cellular Biology, Brown University*

*Postdoctoral Studies, NIH National Cancer Institute*



Martin is a 1997 graduate of the Biological Science program at Grambling State University. In addition to Martin's research efforts as a research associate at Brown University, she has made a conscious effort to give back, by mentoring and motivating STEM students to work hard and excel in their respective disciplines.



**NAME:** ANDRE' A. ADAMS, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Chemistry, Grambling State University*

*Ph.D., Biological Analytical Chemistry,*

*Louisiana State University*

Adams is an established analytical scientist with extensive biosensor engineering/manufacturing experience. His expertise in the development of micro/nanofluidic immunossay platforms is directed towards analytes ranging from trace explosives to low abundance biological targets. According to Adams, the confidence that he displays in his research endeavors, were born out of his academic and research experiences at Grambling State University. He is also grateful to LS-LAMP for the financial support that he received as an undergraduate student.

"Without those funds, I'm sure my family life and matriculation would have suffered dearly," says Adams.



**LOUISIANA STATE UNIVERSITY** | Baton Rouge, LA  
 Strengthening Minority Access to STEM Education from Bachelor's to Ph.D.

*Su-Seng Pang, Ph.D., and Zakiya Wilson, Ph.D., Campus Coordinators*

The impact of LS-LAMP at Louisiana State University (LSU) has resulted in a significant number of students pursuing B.S. STEM degrees. Over the past 16 years, LS-LAMP minority STEM B.S. degrees have steadily increased and is second only to Southern University, Baton Rouge in the production of minority STEM baccalaureates. LS-LAMP at LSU has made outstanding achievements particularly in the area of external funding. LSU used its status as a LS-LAMP partner institution to obtain an NSF Bridge to the Doctorate (BD).

**LOUISIANA STATE UNIVERSITY** | *STUDENT PROFILES*

NAME: BRANDON PITTS

ACADEMIC CREDENTIALS:  
 B.S., Industrial Engineering,  
 Louisiana State University  
 Ph.D. Candidate, Industrial and  
 Operations Engineering,  
 University of Michigan



The research experiences and academic support provided by the LSU LS-LAMP program has impacted Pitts personal and professional life introducing him to a lifetime of learning. Pitts is also thankful for the academic standards set by LS-LAMP.

"The standards set by the program to maintain high academic achievement motivated me to continue to work hard and graduate with Latin honors," says Pitt.

For Pitt, attending graduate school was a dream and the LS-LAMP program gave him the preparation, experience, knowledge and confidence to make his dream a reality.

As an LS-LAMP scholar, Pitt was exposed to research in state-of-the-art research facilities around the nation, including the National Advanced Driving Simulator and the LSU Agricultural Center's LA HOUSE. Pitt is an NSF Graduate Research Fellowship recipient and is pursuing a Ph.D. in Industrial and Operations Engineering at the University of Michigan-Ann Arbor.



NAME: UTIBE BICKHAM, Ph.D.

ACADEMIC CREDENTIALS:  
 B.S., Chemistry and Psychology,  
 Louisiana State University  
 Ph.D., Pathology, University of Wisconsin

Utibe Bickham enjoyed the interdisciplinary networking that she experienced as an LS-LAMP scholar at LSU. The networking offered students a place to "interact with other young bright minds," says Bickham.

While in the LS-LAMP program, Bickman conducted research at the University of Tennessee, LSU Veterinary School and the University of Wisconsin where she is currently pursuing her Ph.D. in Pathology.

As Bickham underwent the graduate school application process, she was confident that she was more than ready for the graduate school experience. She knew that her LS-LAMP research experiences allowed her application to stand out above the rest. During her graduate school interview, she was thrilled to see that the majority of the questions asked during her interview were centered on her research experience.





## McNEESE STATE UNIVERSITY | LAKE CHARLES, LA

### Excellence in STEM Education with a Personal Touch

*George Mead, Ph.D., and Harold Stevenson, Ph.D., Campus Coordinators*

Several key science, technology, engineering, and mathematics (STEM) retention programs and activities at McNeese enjoy institutional status as a direct result of LS-LAMP. Systemic mentoring, tutoring, and evaluation are institutionalized within McNeese State University (MSU) to improve the academic quality of the undergraduate experience for all McNeese students. Institutionalization of programs at the University include (1) the Freshman Foundation course, University 101, required of all incoming freshmen; (2) the College of Science testing center; (3) the College of Science tutoring center; (4) a University writing center; and (5) University funded research with \$1,000 for each of the 27 different departments within the University. McNeese offers a summer bridge program which prepares incoming freshmen for entering STEM BS degree programs and plays an important role in introducing students to MSU. The McNeese Summer Bridge Program is a summer semester Academic Support program where participants earn seven hours of college credit (College Algebra Pre-Calculus, College Trigonometry, and Computer Studies) and become acclimated to campus life and university services by living in campus housing.





**NUNEZ COMMUNITY COLLEGE** (Two-Year Institution) | CHALMETTE, LA

Opening Doors of Opportunity through Science, Technology, Engineering and Math

*Christine Thomas and Carly Gervais, Campus Coordinators*

Minority STEM enrollment continues to increase at Nunez Community College. Nunez conducts once-a-month LS-LAMP Workshops for LS-LAMP students and affiliated students. Workshop presentations include those of invited scientists speaking to students about research and research opportunities, study skills, and the use of the EXCEL Center. The LS-LAMP program has great potential for serving as an entry point that matriculates into STEM BS degree programs. Nunez Community College presently has college articulation agreements with the University of New Orleans, Nicholls State University, Dillard University, University of Southern Mississippi, and Southeastern Louisiana University.

**NUNEZ COMMUNITY COLLEGE** |

## STUDENT PROFILES

NAME: CARL BURKE

ACADEMIC CLASSIFICATION:

*Sophomore, Computer Science Major*



The LS-LAMP program gave Carl Burke the opportunity and support he needed to complete a two-year computer science program at Nunez Community College and transfer to the Southern College of Art and Design in Atlanta, Georgia.

"LS-LAMP's financial support helped me to achieve my academic goals," says Burke.



NAME: SIERRA MCKEE

ACADEMIC CLASSIFICATION:

*Associate of Science (Louisiana Transfer),  
Nunez Community College*

The LS-LAMP program helped Sierra McKee to take her academic experience to the next level. While in the Nunez Community College LS-LAMP program, McKee conducted research at the University of New Orleans.

The purpose of her research project, "Evidence for Non-Conventional Intramolecular Hydrogen Bonds in the Molecular Structure of B-Thymine," was to discover how electrons move around in certain types of materials.

"I would not have received the opportunity to complete the summer research project without the help of LS-LAMP," says McKee. "The program also helped me to realize that there are more opportunities for transfer students."

The Nunez LS-LAMP program scheduled campus tours for LS-LAMP scholars aspiring to transfer to four-year colleges or universities. "During the tours, I realized that there were more transfer opportunities that better suited my academic and career goals," says McKee.



## SOUTHERN UNIVERSITY AND A&M COLLEGE | BATON ROUGE, LA

### Achieving Academic Excellence through Research and Systemic Mentoring

*Diola Bagayoko, Ph.D. and Ella L. Kelley, Ph.D., Campus Coordinators*

SUBR LS-LAMP has continued to immerse its students in the 10-Strand Systemic Mentoring Model described in detail in the “Impact of LS-LAMP” section of this publication. From 2000 to 2011, 28 former SUBR-LS-LAMP Scholars received the Ph.D. These students were all awarded STEM BS degrees from Southern University and A&M College. The excellent and comprehensive implementation of the 10-Strand Systemic Mentoring Model has been illustrated in the following areas. From 2000-2011, a total of nine-hundred and fifty-eight (958) scholars have been immersed in a professional culture by attending at least 30 weekly seminars per academic year, which do not include additional meetings with visiting professors and undergraduate and graduate school recruitment sessions. The weekly seminars primarily consist of (1) GRE preparation topics, (2) short-courses, (3) presentations by eminent guest speakers, (4) oral presentations by scholars, (5) guidance to graduate school, and (6) the dissemination of fellowship and research opportunities. During the seminars, Diola Bagayoko, LS-LAMP Project Director, gives short-courses on topics such as the “Power Law of Human Performance,” “Accuracy, Precision, Completeness, Coherence, and Clarity (APC<sup>3</sup>),” “Key Elements in Professional Conduct,” and “Ethics in Science.” Additionally, in line with the implementation of the 10-Strand Systemic Mentoring Model, six-hundred and seventy-four (674) scholars have engaged in peer tutoring and volunteerism efforts at the University and in their communities.

From 2000 to 2011, 428 scholars were selected to conduct summer research at laboratories around the country. The summer research sites include the University of South Alabama Mitchell Cancer Institute, Iowa State University, Louisiana State University, Morgan State University, Arkansas Center for Space and Planetary Sciences at the University of Arkansas, University of Chicago, California Institute of Technology, University of Kentucky, and Johns Hopkins University, just to name a few. Each summer, SUBR LS-LAMP has been awarded funds to send at least three (3) Faculty and Student Teams (FaST) to conduct research at the Department of Energy (DOE) Laboratories [Los Alamos National Laboratory, Brookhaven National Laboratory, and Fermi National Laboratory]. As a result, one thousand three-hundred and twenty nine (1329) scholars have attended conferences around the country from 2000 to 2011. Four-hundred and forty (440) students gave oral or poster presentations.

For the last eleven years, 548 scholars have been provided with financial support which allowed them to focus on their studies. Our comprehensive monitoring of current and former scholars includes the maintenance and updating of a mentoring portfolio. This portfolio is a pivotal factor in ensuring the comprehensiveness of our exemplary implementation of systemic mentoring. It is a needed tool for follow-up and for writing substantive letters of recommendation.



## SOUTHERN UNIVERSITY AND A&amp;M COLLEGE | STUDENT PROFILES



NAME: KANDACE THOMAS, Ph.D.

ACADEMIC CREDENTIALS:

*B.S., Chemistry, Southern University and A&M College  
Ph.D., Chemistry, Louisiana State University*

In fall 2010 Kandace Thomas, joined the growing number of LS-LAMP scholars to earn a Ph.D. Thomas completed her dissertation at Louisiana State University under Professor Julia Chan.

An avid proponent for community outreach, Thomas plans to support and conduct research in the development of scientific outreach programs to widen the pipeline of K-12 students interested in science, as well as promote science education reform through the training and mentorship of secondary school teachers.

During the 2009-2010 academic year, Thomas was awarded an LSU GK-12 fellowship and as part of her fellowship activities, she assisted in the implementation of a new scientific subject area. The subject was implemented into three 8th through 10th grade classrooms.

Thomas plans to pursue an alternative teaching certification, certifying her to teach at the secondary level.

NAME: ANTHONY PULLEN, Ph.D.

ACADEMIC CREDENTIALS:

*B.S., Physics, Southern University and A&M College  
Ph.D., Theoretical Astrophysics, California Institute  
of Technology (CalTech)*



In May 2004, LS-LAMP Scholar Anthony Pullen led Southern University's spring commencement ceremony as the chief student marshal of the spring 2004 graduating class. As if his top scholar status was not enough, Pullen received more great news. He did not have to worry about graduate studies because he had received acceptance letters from four of the nation's top research universities—Stanford, Berkeley, MIT and Princeton.

Pullen's research interests include cosmic microwave background radiation and astrophysical constraints to dark matter and dark energy. While at SUBR, Pullen received the Student of the Year Natural Sciences Award and was a NASA scholar from 2001 until he graduated in 2004. At Caltech, he received the Minority Undergraduate Research Fellowship and the National Science Foundation Graduate Research Fellowship.

## SOUTHERN UNIVERSITY AND A&M COLLEGE | STUDENT PROFILES *continued*

NAME: KINESHA HARRIS, Ph.D.

ACADEMIC CREDENTIALS:

*B.S., Chemistry, Southern University and A&M College  
Ph.D., Bio-Inorganic Chemistry, University of Iowa*



Kinesha Harris has returned to Southern University to give STEM students the same quality education and mentoring she received as an undergraduate LS-LAMP scholar at Southern University-Baton Rouge. Today, Harris is an assistant professor in the Department of Chemistry at SUBR. She earned her bachelor of science degree with honors in Chemistry from Southern University in 1999 and her Ph.D. in bio-inorganic chemistry from the University of Iowa in 2006. During her undergraduate matriculation at SUBR, Dr. Harris was a recipient of the Science and Engineering Alliance (SEA) Undergraduate Award and the American Chemical Society Organic Chemistry Award. Harris currently teaches general chemistry and biochemistry at SUBR and conducts research in the areas of natural products and protein chemistry. She is a member of a number of professional scientific organizations including the American Chemical Society, National Association of Black Chemists and Chemical Engineers (NOBCChE), and AAAS. She is also a lifetime member of the Girl Scouts of the USA and currently serves as a Girl Scout Leader. She is faculty senator for the College of Sciences at Southern and has served on many university and departmental committees. Harris is also a recent inductee inducted into the Southern University NSF HBCU-UP STEM Hall of Fame as both a student and a young professor.



NAME: GLORIA THOMAS, Ph.D.

ACADEMIC CREDENTIALS:

*B.S., Chemistry, Southern University  
and A&M College  
Ph.D., Analytical Chemistry,  
Louisiana State University*

Gloria Thomas has taken her LS-LAMP experience to the university classroom. Currently, she is an assistant professor of chemistry at Xavier University and has spent the last decade as a successful academician. Thomas was a National Research Council Postdoctoral Fellow at the National Institute of Standards and Technology (NIST) and later joined the faculty of Mississippi State University. Thomas is also the principal investigator for the National Science Foundation Chemistry Research Experiences for Undergraduates (REU) Leadership Group and a member of the Executive Board of the National Organization of Black Chemists and Chemical Engineers (NOBCChE). She is also involved in the American Chemical Society as a past committee subcommittee chair of the Younger Chemists Committee.

Thomas has published several research papers including bioanalytical applications of electrophoresis and microdevice technology and new technologies and strategies in chemical education. In addition to her passion for education, Thomas also enjoys photography and iEverything.



**SOUTHERN UNIVERSITY AT NEW ORLEANS** | NEW ORLEANS, LA  
 Rebuilding STEM Education After Hurricane Katrina

*Joe Omojola, Ph.D., Campus Coordinator*

In the aftermath of Hurricane Katrina, SUNO was faced with the termination of all STEM departments (except for biology and the newly reinstated mathematics program) which created significant problems not only for the students, faculty, and staff but also LS-LAMP. Although, optimally better in previous years, for two consecutive years SUNO matriculated more underrepresented minority students to graduate programs. SUNO remains positive and appears to have the appropriate faculty and students to maintain and indeed excel in the education and training of minority STEM students. The mathematics department at SUNO established a fully staffed Math laboratory operated by student tutors and LS-LAMP students. SUNO continues to increase outreach activities with the pre-college community emphasizing to minority students to enroll in baccalaureate STEM degrees.

**SOUTHERN UNIVERSITY AT NEW ORLEANS** | *STUDENT PROFILES*



**NAME:** IFEANYI CHUKWU ONOR, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Biology, Southern University  
 at New Orleans*

*Pharm.D., Xavier University of Louisiana*

Ifeanyi Chukwu Onor began his studies at Southern University at New Orleans as a Biology major and LS-LAMP scholar. Today, Onor is a PharmD graduate from Xavier University.

Onor has participated in a number of research experiences including serving as a research assistant at Xavier's Center for Nanomedicine and Drug Delivery and a research intern for the Department of Biology at Southern University New Orleans.

Onor was also the class president of Xavier's fourth year pharmacy students (class of 2011). Awards received include the Mother M. Agatha Ryan Award, the Albert P. Lauve Hospital Pharmacy Award, the Xavier University College of Pharmacy Award for Excellence and numerous other awards and accolades.

**NAME:** PAULETTE N. WILLIS, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Physics, Southern University at New Orleans*

*B.S., Mathematics, Southern University  
 at New Orleans*

*M.S., Mathematics, University of Iowa,  
 Iowa City, IA*

*Ph.D., Mathematics, University of Iowa,  
 Iowa City, IA*



SUNO LS-LAMP Scholar Paulette N. Willis is an NSF Postdoctoral Research Fellow at the University of Houston. Her current research, as part of the U of H Analysis Research Group, is Functional Analysis (46L) and Dynamical Systems (37B).

Willis has extensive education experience including serving as an algebra instructor for the BEST CHESS program for gifted second and third graders, teaching basic algebra and mathematics concepts for the Upward Bound Summer Program and Topology instructor for the WINGS program for gifted third and fourth graders.



## SOUTHERN UNIVERSITY AT SHREVEPORT (Two-Year Institution) | SHREVEPORT, LA Improving Access to STEM Education

*Robert Hudson, Ph.D., Campus Coordinator*

This institution has been a major supporter of LS-LAMP. Systemic mentoring plays a crucial role for all STEM student support activities at SUSLA. Former LS-LAMP Coordinator Warner Brown's excellent work resulted in steady increases of LS-LAMP budget allocations to SUSLA. These increases were based on tangible systemic mentoring activities and their results, including the transfer of SUSLA students to four-year STEM programs. In 2010-11, 15 students transferred to four-year programs. The SUSLA LS-LAMP program continues to be a model for systemic reform and academic excellence at this two-year institution.



**Warner K. Brown**, served as campus Coordinator (deceased): LS-LAMP Senior Alliance would like to commend Mr. Brown for his admirable leadership, dedication and commitment to SUSLA LS-LAMP over the years (2003 – 2010). He will be truly missed.



## Empowering Minority Students through STEM Education and Research

*Michael Cunningham, Ph.D., Campus Coordinator*

*Hank Bart, Ph.D., Former Campus Coordinator (2005-2010)*

Prior to LS-LAMP, there were no systemic programs that had a direct focus on minority STEM students at Tulane University. Because of LS-LAMP, Tulane has initiated a Systemic Planning Committee that has developed a plan to increase minority STEM graduation rates. In addition, the committee proposed establishing an Office of Science Education that is devoted to increasing access and success in STEM education and practice for all Tulane students. Tulane also implemented a team approach to mentoring. The teams consist of faculty from Tulane, Dillard and Southern at New Orleans.

Additionally, Tulane continues to contribute to LS-LAMP by offering research experiences for minority STEM undergraduates in summer research. From the inception of LS-LAMP, Tulane and LSU, the two Research 1 universities, have worked to provide summer research opportunities to LS-LAMP students from partner institutions. Tulane and Xavier Universities have formed an undergraduate training partnership in engineering called 3+2=2°, which allows Xavier students to receive two Bachelor degrees in five years: one in science from Xavier and one in engineering from Tulane. In addition, a new partnership called the Pipeline Program was established which provides opportunities for outstanding undergraduate students to gain admission to doctoral programs at Tulane.

Tulane's Office of Multicultural Affairs has developed two mentoring programs: Big Brothers/Big Sisters Multi-ethnic Peer Support and AGAPE. The Big Brothers/Big Sister program assists incoming students with the adjustment process. The goal of AGAPE is to establish an instant support network between freshmen and faculty/staff members.







**NAME:** *DANNIELLE SOLOMON-FIGUEROA*

**ACADEMIC CREDENTIALS:**

*B.S., Biomedical Engineering, Tulane University*

*Ph.D. Candidate, Biomedical Engineering,  
Drexel University, Philadelphia, PA*

Dannielle Figueroa amassed a wide range of research experiences and awards as a scholar in Tulane's LS-LAMP program. Summer 2003, Figueroa was an undergraduate research assistant in the Tulane University Cartilage Tissue Laboratory. What began as just a summer project culminated as her undergraduate honors thesis. Figueroa has also conducted research at the University of Texas Health Science Center in San Antonio and is currently a graduate research assistant in the Vascular Kinetics Lab at Drexel University in Philadelphia, Pennsylvania.

"As I completed my undergraduate studies, I found that my research experience led to more interviews than my classmates," said Figuero, who also credits her LS-LAMP mentors for helping her to select the best graduate school and graduate fellowship.

**NAME:** *MANUEL ALEJANDRO FIGUEROA*

**ACADEMIC CREDENTIALS:**

*B.S., Biomedical Engineering,  
Tulane University*

*Ph.D. Candidate,  
Biomedical Engineering,  
Drexel University, Philadelphia, PA*



The LS-LAMP Program not only prepares students for the rigors of STEM research and education, but also offers students research experiences that open the door of opportunity in a variety of areas—masters-level/doctoral research, employment in industry and national laboratories, college/university research labs, teaching opportunities and the list goes on. Manuel Figueroa experienced these opportunities after completing undergraduate studies as a LS-LAMP scholar in Tulane's Biomedical Engineering Program.

Figueroa hit the ground running conducting research in both his freshman and sophomore year. Upon graduation Figuero was accepted to the University of Rochester Biomedical Program with a full departmental fellowship. He was also offered a job with the Air Force Research Laboratory in San Antonio, Texas. Figueroa accepted the position with the Air Force and credits his LS-LAMP research experiences for the job opportunity.

During Figueroa's interview with the Air Force, he was able to describe in detail his freshman and sophomore year research projects, which focused on the development of laser treatments to remove tumors from breast tissue. Coincidentally, the Air Force was searching for qualified people to work in their Optical Radiation Branch which studies the biological effects of laser on skin and eyes.

"My freshman and sophomore year research experiences helped me get the job," said Figueroa.



**UNIVERSITY OF LOUISIANA LAFAYETTE** | LAFAYETTE, LA  
 Helping Students Move Confidently in the Direction of their Dreams

*Vijay Raghavan, Ph.D., and Bobbie Decuir, Ph.D., Campus Coordinators*

The University of Louisiana Lafayette (ULL) LS-LAMP program continues to be a strong partner in the effort of increasing the number and quality of graduates pursuing degrees in STEM. Evidence of the program’s growth is the graduates who have completed their undergraduate courses of study and have gone on to receive doctoral degrees and secure prominent positions in higher education and in industry.

**UNIVERSITY OF LOUISIANA LAFAYETTE** | **STUDENT PROFILES**



**NAME:** ERIC A. DECUIR JR., Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Electrical Engineering–Telecommunications,  
 University of Louisiana–Lafayette*

*M.S., Microelectronics–Photonics,  
 University of Arkansas, Fayetteville, AR*

*Ph.D., Microelectronics–Photonics,  
 University of Arkansas, Fayetteville, AR*

Eric Decuir’s undergraduate research experiences opened his eyes to the many opportunities available in the world of fundamental and applied research. Today, Decuir is a research scientist for the Army Research Laboratory in Adelphi, Maryland.

“The research process was instrumental in refining the efficiency and effectiveness of my ‘self education,’” said Decuir. “I was no longer bound to the classroom or my professors in my quest for knowledge or answers.”

Decuir also enjoyed the sense of camaraderie that he shared with his fellow LS-LAMP scholars. “LS-LAMP creates a sense of community by bringing together your researchers of like minds and ambitions.”



**NAME:** WAKEEL IDEWU, Ph.D.

**ACADEMIC CREDENTIALS:**

*B.S., Civil Engineering, University of Louisiana Lafayette*

*M.S. Engineering Science, Louisiana State University,  
 Baton Rouge, LA*

*Ph.D, Civil and Environmental Engineering,  
 Louisiana State University*

Just like his LS-LAMP peers, Wakeel Idewu has acquired a number of prestigious honors for his research efforts and academic work. Idewu was awarded the National Science Foundation Bridge to the Doctorate Award, the Donald W. Clayton Excellence Award, Minority Engineering program Graduate Student of the Year, the Graduate Alliance for Education in Louisiana Award and the Arthur Ashe Award.

Idewu participated in the Research Experience for Undergraduates Program at Louisiana Tech’s Institute for Micro-Manufacturing Lab. Idewu has also conducted research at the Virginia Military Institute, the Transportation Lab at Louisiana Sate University and the Department of Civil and Environmental Engineering at the University of Louisiana Lafayette. Today, Idewu teaches at the Virginia Military Institute in Lexington, Kentucky.



**UNIVERSITY OF NEW ORLEANS** | NEW ORLEANS, LA

## Taking the Next Step in Systemic Mentoring

*Ashok Puri, Ph.D., Campus Coordinator*

In 2009, the University of New Orleans freshman minority STEM enrollment increased considerably in part due to UNOs Next Step Summer Program, which enables students, in five years, to receive both a physics and an engineering degree. The successful utilization of LS-LAMP resources and the implementation of systemic mentoring practices have caused the program to expand to a year-round comprehensive systemic mentoring program. Next Step implemented institutionalized university credit courses and specialized sections that equip students with basic research skills through active research and instruction. In addition, the UNO Physics Department, under the auspices of the 3+@ dual degree program, recruits students from Dillard and SUNO. The UNO LS-LAMP program has also progressively moved toward an INCENTIVE-based program that provides support in the form of book awards for academic improvement and awards for winning research presentation competitions.

UNO LS-LAMP has also offered a week-long problem solving activity (summer 2010) to community college students needing enrichment in algebra, trigonometry, and algebra-based physics. Of which, eight (8) community college students, five (5) from Nunez and three (3) from Delgado, participated in a short pre-college experience.

## UNIVERSITY OF NEW ORLEANS | STUDENT PROFILES



**NAME:** *JOLENE ROBIN-McCASKILL, Ph.D.*

**ACADEMIC CREDENTIALS:**

*B.S., Electrical Engineering, University of New Orleans*

*M.S., Applied Physics, University of New Orleans*

*M.S., Geophysics, Stanford University*

*Ph.D. candidate, Geophysics, Stanford University*

Stanford Ph.D. candidate Jolene Robin-McCaskill admitted that initially she did not perform to her potential during her undergraduate studies, but the LS-LAMP program helped McCaskill to discover her talents, which also helped her to excel academically.

"LS-LAMP was the first time that I felt that my talents were recognized," said McCaskill. "My experience with LS-LAMP and LS-LAMP Campus Coordinator Ashok Puri are the sole reason that I am at Stanford University."

Puri encouraged McCaskill to take advantage of internship opportunities. McCaskill eventually began tutoring other LS-LAMP scholars. It was during her time as a tutor that McCaskill realized that she had a talent for taking difficult concepts and breaking it down where the concepts could be more easily understood. Currently, McCaskill is in her final year of Ph.D. studies at Stanford University in Geophysics.



**NAME:** *SYDEAKA WATSON, Ph.D.*

**ACADEMIC CREDENTIALS:**

*B.S., Mathematics, University of New Orleans*

*M.S., Mathematics, Michigan State University,  
East Lansing, MI*

*M.S., Statistical Science, Baylor University, Waco, TX*

*Ph.D., Statistics, Baylor University, Waco, TX*

UNO LS-LAMP Coordinator Ashok Puri describes Sydeaka Watson as "a model student, a perfect mentor and a great researcher and scientist." Watson's peer reviewed articles and conference presentations are evidence of her "star student" status.

Watson was the second place winner of the 2010 Joint Statistical Meetings (JSM) Stat Bowl. She was also named Outstanding Graduate Student (2010) by Baylor University's Department of Statistical Sciences. She has also participated in a number of research experiences including Dillard University's Summer Transition Program, University Illinois Urbana-Champaign Summer Research Opportunities Program, Michigan State University Summer Research Opportunities Program and conducted research on Theoretical Biology and Biophysics as a graduate student at Los Alamos National Laboratory.



**XAVIER UNIVERSITY** | NEW ORLEANS, LA

## Strengthening STEM Research Opportunities in the Crescent City

*Murty Akundi, Ph.D., Campus Coordinator*

In 2010, Xavier University of Louisiana joined LS-LAMP as its newest alliance partner institution. Originally, Xavier University was part of LS-LAMP, however, they were invited to lead the United Negro College Fund (UNCF) AMP. In 2009, they expressed an interest in joining LS-LAMP and have been actively participating since. Xavier has a long tradition of conducting STEM activities with particular emphasis on undergraduate research which gives the undergraduate a competitive edge for admission to STEM graduate school. In 2010-11, 123 minority students earned BS STEM degrees. In addition, as an LS-LAMP partner, eight Xavier students conducted research and reported their finding. STEM students at Xavier University are immersed in the 10-Strand Systemic Mentoring model of LS-LAMP. They are being groomed to make substantial contributions in the future to our state and to the nation.

Murty Akundi, Ph.D., chair of Xavier's Department of Physics was selected by Xavier's administration to serve as campus coordinator.





## LOUISIANA UNIVERSITIES MARINE CONSORTIUM | CHAUVIN, LA

### Enhancing Minority Participation in Marine Science

Minorities have historically been underrepresented in marine sciences. In an effort to increase minority engagement and exposure, the LS-LAMP program partnered with the Louisiana Universities Marine Consortium (LUMCON) in 1997.

LUMCON provides quality educational opportunities in marine and environmental science for undergraduate and graduate students. The LUMCON LS-LAMP program focuses on topics such as marine geology; marine sedimentology; marine geochemistry; fisheries; mariculture; and coastal wetland loss, modification and restoration.

The research facility provides opportunities for LS-LAMP scholars and faculty to conduct research that expands their knowledge of marine science.

LUMCON has the following facilities available for research:

- **The Woody J. De Felice Marine Center**, which offers 26,000 square feet of laboratory, classroom and office space, dormitory rooms, five apartments and housing with up to 88 visitors
- **The Fourschon Remote Field Station** in Port Fourchon, Louisiana
- **The Feaman Bayou Field Station**, Vermillion Bay, Louisiana
- Network of **micro-computers and peripherals**
- Multiple **running seawater systems**
- Several **aquarium rooms** with running water for experimentation
- **Culture rooms** for growing plankton
- Temperature- and light-controlled **environmental chambers**
- **Large race track flume** for hydrodynamic studies
- **Water Vessels**







**LS-LAMP:**  
**LIGHTING**  
the Path to  
**OUR FUTURE**

WITH  
**S**CIENCE,  
**T**ECHNOLOGY,  
**E**NGINEERING AND  
**M**ATHEMATICS



## LOUIS STOKES LOUISIANA ALLIANCE FOR MINORITY PARTICIPATION (LS-LAMP)

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