

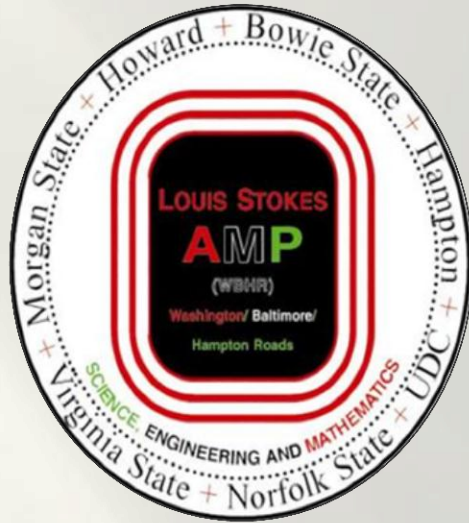
Washington Baltimore Hampton Roads
Louis Stokes
Alliance for Minority Participation



**Impact on National Science
Policy and STEM Workforce**

*Building a Network of Leaders in Science, Technology,
Engineering, and Mathematics.*





WASHINGTON BALTIMORE HAMPTON ROADS
LOUIS STOKES
ALLIANCE FOR MINORITY PARTICIPATION
18TH YEAR IMPACT



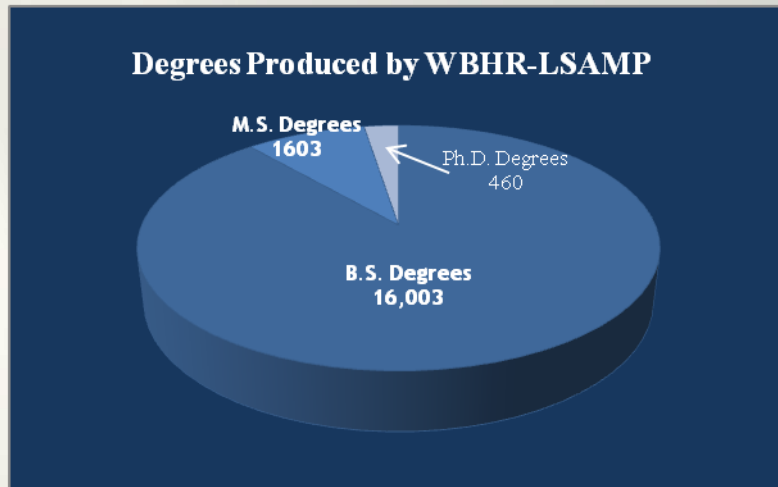
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The Washington Baltimore Hampton Roads - Louis Stokes Alliance for Minority Participation (WBHR-LSAMP) was established in 1993 under a cooperative agreement through the Directorate for Education and Human Resources (EHR) of the National Science Foundation (NSF). Four HBCU partner institutions in the middle-Atlantic region of the nation formed a working alliance. These institutions included the University of the District of Columbia (UDC), Hampton University (HaU), Morgan State University (MSU), and Howard University (HU) serving as the lead institution. At the end of the first five years in 1999, the alliance had produced almost 3600 B.S. degrees in STEM fields. In 2000, an expanded alliance was formed with three additional HBCU partners including Bowie State University (BSU), Norfolk State University (NSU), and Virginia State University (VSU). This expanded alliance continued to focus on seeking to increase the number of underrepresented minorities who choose careers in STEM fields and to substantially increase the number of minority students earning B.S. degrees, and subsequently continue their education by pursuing M.S. and Ph.D. degrees in STEM disciplines. The Alliance continued to foster these goals and added an emphasis on working with community colleges and accommodating community college graduates as the expanded Alliance continued to operate through 2012.

From 2000-2012, the WBHR-LSAMP activities continued to build on the successes over the previous years to ensure: 1) a substantial impact on the rate of attendance in STEM graduate programs by program participants(Bridge to the Doctorate fellowship activity, graduate symposia, seminars and workshops, and research); 2) increased rate of graduation of underrepresented minorities at the baccalaureate and at Alliance member institutions; 3) institutionalizing best practices(peer mentorship, tutoring, and preparation for the GRE, tutoring in gate-keeping courses, curriculum development, increased faculty mentored research, facilitate the transfer of community college students into STEM areas, presentations at state, regional and national conferences); 4) increased emphasis on collaboration(partnerships with other NSF projects, partnerships with other sponsored programs, partnerships with national laboratories, private corporations; and 4) expanding opportunities for student engagement in international activities.



Based on the trend line data presented since 2000 (baseline year), there have been more than 16,000 minority students awarded the BS degree in STEM fields, 1603 MS degrees in STEM fields and 460 Ph.D. degrees by the WBHR-LSAMP Institutions making the WBHR-Alliance the largest producers of STEM degrees in the nation. Data collection and analysis of student performance and STEM-related activities have been institutionalized at all of the WBHR-LSAMP partner institutions. One of the lessons learned throughout the WBHR- Alliance has been the importance of implementing a comprehensive evaluation plan inclusive of qualitative and quantitative methodologies. We have improved our efforts to more accurately track STEM students once they graduate or leave the WBHR-LSAMP institutions. Previous efforts to track STEM students have been limited to their matriculation through undergraduate and graduate programs at respective institutions. We continue to enhance these efforts and institutionalize an online tracking system of STEM graduates from the WBHR-LSAMP Alliance Institutions. The potential uses of this information include the development of a database to promote networking and research collaboration among WBHR-LSAMP faculty, students, and alumni; a mechanism for disseminating information related to faculty openings at WBHR-LSAMP institutions; and, a resource for STEM students interested in identifying research mentors both within and outside of the WBHR-LSAMP Alliance.

Over the next five years, we expect to 1) increase research support and collaboration with other research institutions and thereby increase the percentage of STEM students going to graduate school from the current 30% to 40%; 2) improve retention of STEM students; 3) double the number of students matriculating in the WBHR-Alliance from community colleges; and 4) increase the number of WBHR-Alliance students participating in undergraduate international research experiences from the current approximately 20 students/year to more than 50 students/year by 2015. The WBHR-LSAMP will focus on program sustainability and intensified LSAMP activities to raise the graduation rate to 1,600 degrees per year in the STEM disciplines by 2015 (approximately 5% per year).



WBHR-LSAMP Participants Highlights and Contributions to Postsecondary STEM Education



Introduction

Since 1993, the Washington Baltimore Hampton Roads-Louis Stokes Alliance for Minority Participation (WBHR-LSAMP) Program, there has been significant research and teaching infrastructure building at all of the Alliance institutions; strategic expansion of STEM degree offerings at the BS, MS, and Ph.D. levels; new courses in STEM; increased degree production at all levels; improved retention; significant increase in the number of technical publications in refereed journals; progression and graduation rate increases at all institutions; awards of nationally recognized fellowships including the Rhodes Scholarship, Hewlett Packard Fellowship, NSF graduate fellowship; and increased collaboration with major research institutions, national laboratories, and industry. In fact, the WBHR-LSAMP Program or WBHR-Alliance, which includes Howard University (HU) as the lead institution, and Morgan State University (MSU), Bowie State University (BSU), the University of the District of Columbia (UDC), Virginia State University (VSU), Hampton University (HaU) and Norfolk State University (NSU), ranks in the top producers of all STEM degrees for African Americans in the nation at the BS, MS, and Ph.D. levels. Furthermore, four of the seven institutions rank in the top 50 producers of African Americans with Ph.D. degrees in STEM fields in the nation. The WBHR- Alliance serves one of the largest potential STEM populations among all of the NSF LSAMP Programs. Further, all of the WBHR-Alliance members were founded on the principle of serving our nation by producing a diverse population of Americans previously underserved by higher education.

Undergraduate Programs

- ▶ During the last five years of the WBHR-LSAMP Program, every member institution within the WBHR-LSAMP received an institutional grant from the NSF HBCU-UP program for the improvement of retention strategies (including improved pedagogy, tutoring support, and increased undergraduate research) and STEM course improvement for STEM students typically in the lower divisions. Many of the WBHR-LSAMP activities are co-sponsored by the HBCU-UP Programs.
- ▶ Two Alliance members, Norfolk State University and Virginia State University received ABET accreditation (Accreditation Board of Engineering and Technology) for their new engineering programs in electronics engineering, optical engineering, and manufacturing engineering.
- ▶ More than 350 students participate in the summer symposia sponsored by the WBHR- Alliance each year. Furthermore, there has been an increase in the number of students participating in undergraduate research at the Alliance member institutions as well as at other major universities and national laboratories. Many of the top prizes awarded are won by WBHR-LSAMP students
- ▶ The calculus reform effort at all of the WBHR- Alliance partner institutions, which allows students to work in small groups and solve problems using calculators and computers, has been institutionalized.

▶ Bowie State University's Science, Engineering, and Mathematics Education (BSEME) Reform, grouped under the Model Institutions for Excellence (MIE) Initiative, is a joint partnership between the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). In concert with the goal of the WBHR-LSAMP Program, the main goal of BSEME is to ensure that a higher number of students seek and complete advanced degrees in the STEM areas. Many of activities of BSEME are co-sponsored with WBHR-LSAMP Program

▶ Howard University with the University of Wisconsin as a partner has just received a National Security Education Program grant for teaching less frequently taught African Languages including Swahili and Yoruba. Students travel to African countries as a part of this grant. STEM students are encouraged to participate in this program.

Graduate Program

▶ The Ph.D. Program in Atmospheric Sciences at Howard University, that started as a summer workshop through the WBHR-LSAMP Program, has graduated ten students with Ph.D.s in Atmospheric Sciences.

▶ Morgan State University now has three doctoral programs in Engineering, Environmental Sciences, and Mathematics. A new Ph.D. program in Materials Science and Engineering was started at Norfolk State University in fall, 2008; and a new Ph.D. degree program in Computer Sciences at Bowie State University was initiated in 2007.

▶ New MS degree programs in computer science, optical engineering, and electronic engineering were established at Norfolk State University in fall 2004.

▶ Morgan State University received an NSF Research Infrastructure in Science and Engineering (RISE) grant that will advance fundamental scientific and technological knowledge necessary for the development of new biological and chemical sensors. This program provides funding for developing an integrative undergraduate/graduate research infrastructure.

▶ Howard and the University of Texas at El Paso have formed a unique partnership in graduate education. As the nation's leading predominantly HBCU and Hispanic Serving Institutions, the two universities have joined forces to increase the number of underrepresented individuals in the science, technology, engineering, and mathematics fields who will join the professoriate. Approximately 220 students from universities and colleges from across the nation participated in the Annual Howard University (HU)/ University of Texas at El Paso (UTEP) Post doctorate Preparation Institute, on the campus of Howard University.

▶ Howard University has hosted 60 Bridge to the Doctorate (BD) students. These students earned bachelors degrees in engineering, mathematics, computer science, physics, chemistry, and the biological sciences and are matriculating toward Ph.D. degrees in mathematics, engineering,

chemistry, physics, computer science, and the biological sciences (pharmacology, biology, microbiology, physiology/biophysics, anatomy, and genetics). The BD Program is strongly linked to Howard's Alliance for Graduate Education and the Professoriate (AGEP) and other funded programs.

Collaborative Programs with other Major Research Institutions ▶ Howard University is a partner with Georgetown University in the NSF funded project Partnership for International Research and Education (PIRE).

▶ Howard University has worked collaboratively on research projects with Brookhaven and Argonne National Laboratories for students enrolled the WBHR-LSAMP Program. We plan to continue these collaborations.

▶ The Massachusetts Institute of Technology (MIT) and Hampton University (HaU) Physics groups are key players in the development of the Electron Ion Collider. Summer research opportunities are offered to undergraduate students to participate in these studies.

▶ Norfolk State University serves as a partner in the NSF- funded Engineering Research Center on fiber-optics and communications networks with the University of Arizona @ Tucson serving as the lead institution. Other partner institutions include Caltech, University of California @ San Diego, Stanford, Columbia and Tuskegee University. Industrial partners, as well as international companies, are involved in this research.

▶ Howard University and Morgan State University were selected as two of seven minority institutions to receive NASA's Minority University Research and Education Program grants. The goal of NASA's education program is to establish significant, multi-disciplinary scientific, engineering and commercial research centers at the host universities that contribute substantially to NASA programs. The goals of the center include improving weather, climate, and air quality prediction and analysis through collaborative research in atmospheric observations with NASA and producing more minorities with Ph.D.s in the science fields. The WBHR-LSAMP students, majoring in selective STEM areas (physics, computer sciences and engineering), will work closely with the NASA Program.

▶ The Water Resources Research Institute (WRRI) of the University of the District of Columbia (UDC) is one of a network of 54 Institutes at land-grant universities, partly funded by the US Geological Survey (USGS) through the US Department of Interior, under the National Water Resources Research Institutes Program. The Institute coordinates and facilitates water resources related research projects through seed grants provided to faculty members from the consortium of universities in the District. Presently, these universities include UDC, Howard University, George Washington University, The Catholic University, Georgetown University, George Mason University, and American University. The opportunity to train students through development and implementation of practical applications of water science in Biological, Environmental, Urban Development and Engineering Programs is a major accomplishment of the Institute.

Enrollment/ Degree Production

STEM enrollment in the 1993/1994 was 5052. By 2000/2001, the enrollment had increased by 55% and by 2009/2010, the enrollment had increased by 64% (Figure 1). Within the Alliance, it is encouraging to note that 8295 students enrolled in STEM courses in the 2009/2010 term. This represents the highest level of STEM enrollments since the Alliance was formed. The Alliance continues to concentrate on improving enrollment of minority students into the STEM disciplines and is actively working with community colleges to pursue and enroll STEM students.

As shown in Figure 2, the total number of degrees produced by the WBHR-LSAMP Program has shown dramatic increases over 18 years (16003 B.S. degrees; 1603 M.S. degrees; 460 Ph.D. degrees). All of the schools produced sharp increases in the number of STEM graduates.

In Figure 3, Bowie State University increased the number of B.S. degrees by 49% (51 to 76). The number of M.S. degrees increased by 29% during the period of 1999/2000 to 2009/2010 (Figure 4).

Hampton University increased the number of B.S. degrees by 25% (Figure 5). In Figure 6, the number of M.S. degrees increased from 10 to 41(310%). The number of Ph.D.s showed an increase of 200% (Figure 7).

At Howard University, the lead school, the number of B.S. degrees produced increased by 114% (Figure 8). The number of M.S. degrees increased by 52% (Figure 9) and the number of Ph.D. degrees increased by 152% (Figure 10).

Morgan State University increased the number of B.S. degrees by 39%. Since the 1999/2000 academic year (Figure 11), the number of M.S. degrees increased by 290 % (Figure 12) and the number of Ph.D.s increased by 300% (Figure 13).

Norfolk State University showed only a 3% increase in the B.S .degrees over the ten year period (Figure 14). However, the number of M.S. degrees showed an increase of 400% (Figure 15).

In Figure 16, the University of the District of Columbia showed an increase in the number of B.S. degrees from 124 to 139 (12%). The number of M.S. degrees showed an increase of 310% (Figure 17).

Virginia State University showed an increase of 57% in the number of B.S. degrees produced (Figure 18). At the M.S. level, the number of degrees increased by 75% (Figure 19).

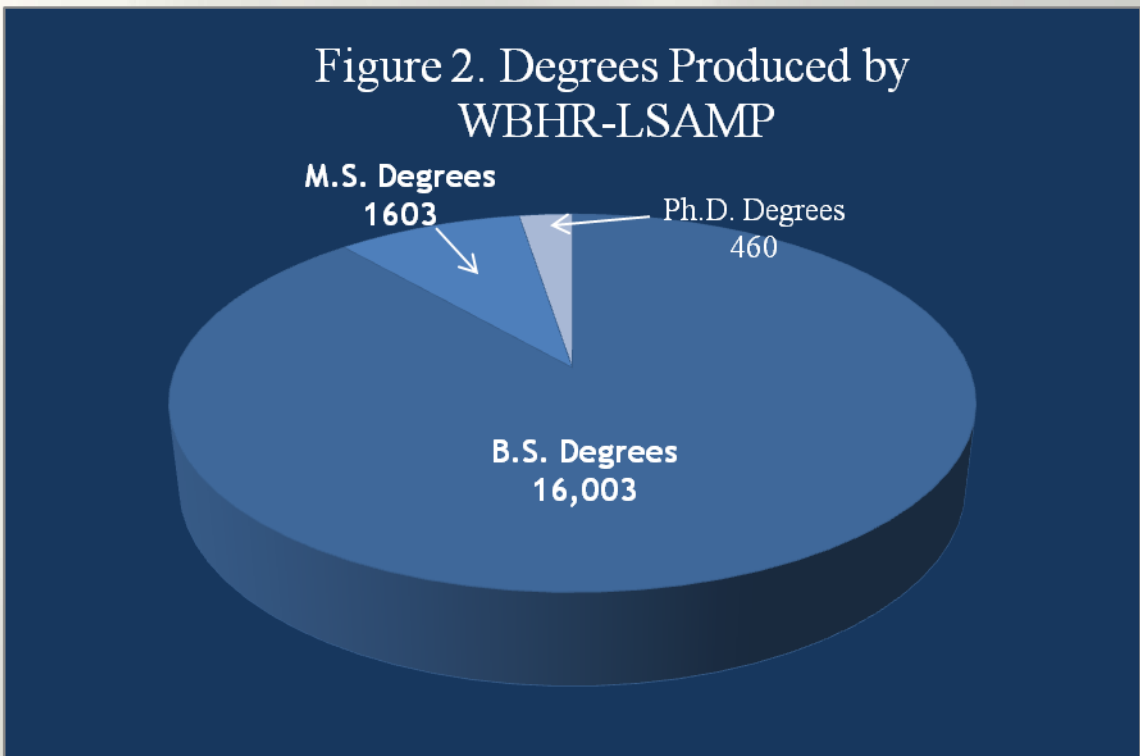
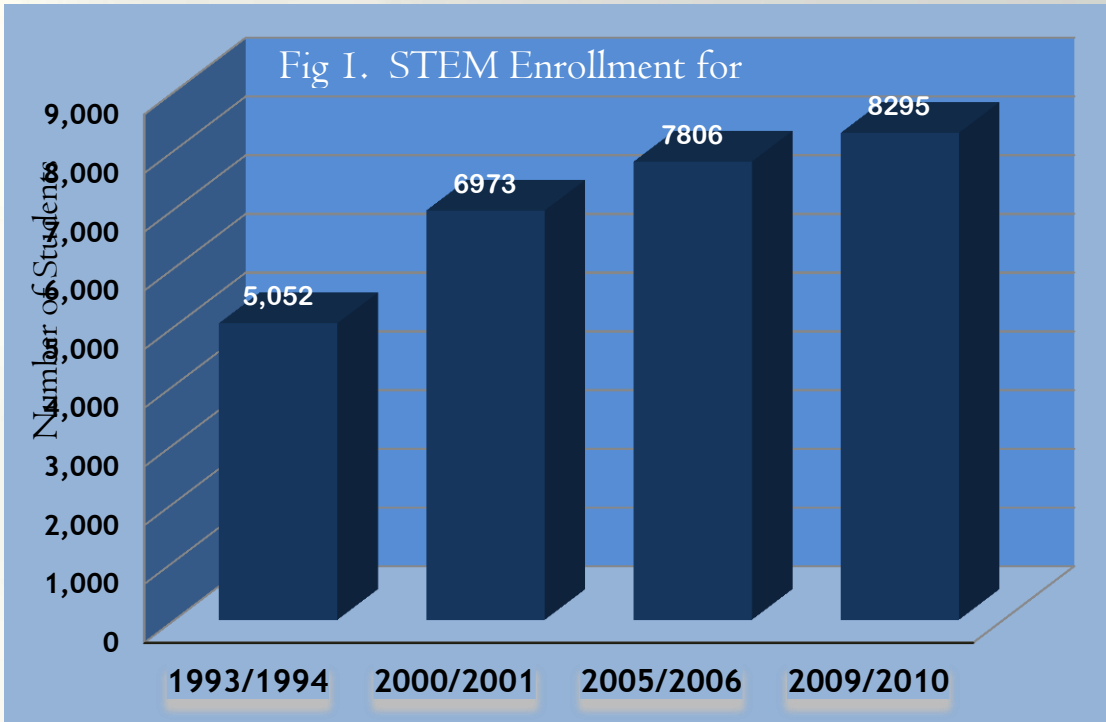


Fig. 3 Bowie State University B.S. Degrees

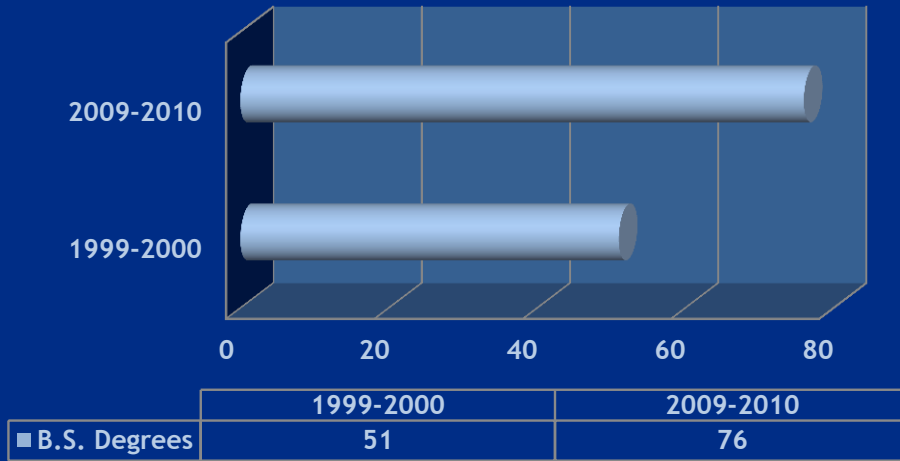


Fig. 4 Bowie State University M.S. Degrees

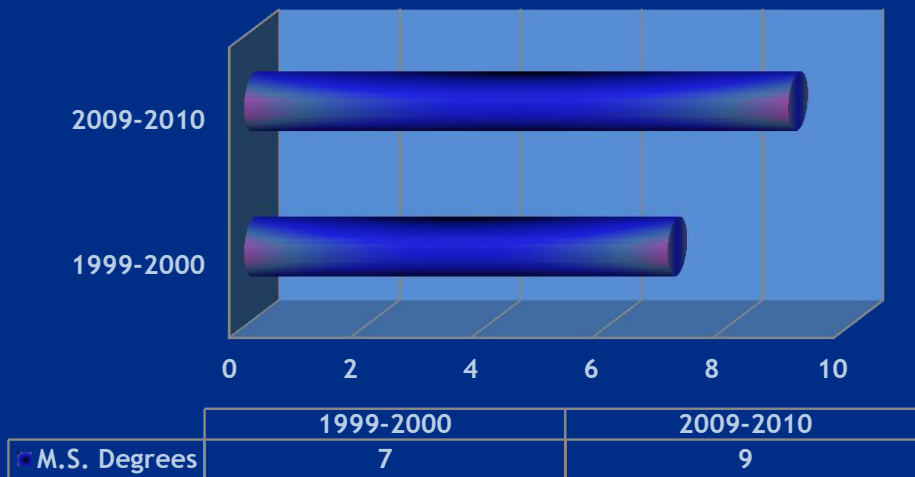
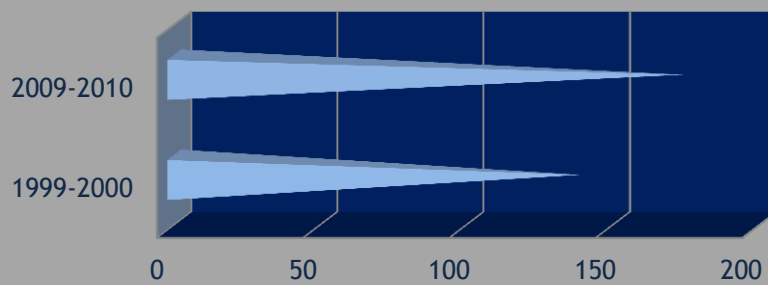
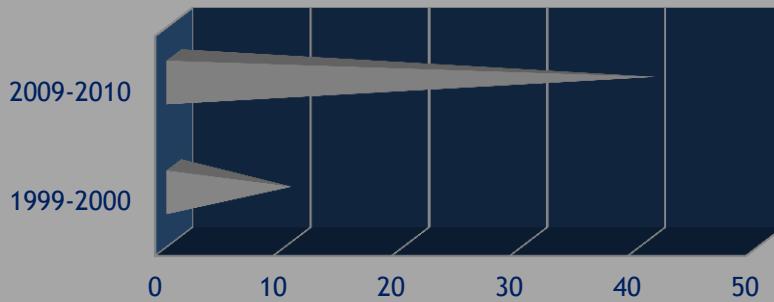


Fig. 5 Hampton University B.S. Degrees



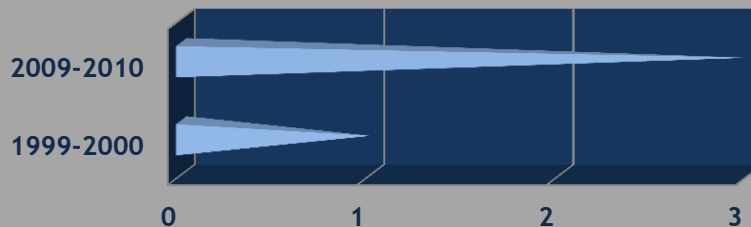
	1999-2000	2009-2010
■ B.S. Degrees	139	174

Fig. 6 Hampton University M.S. Degrees



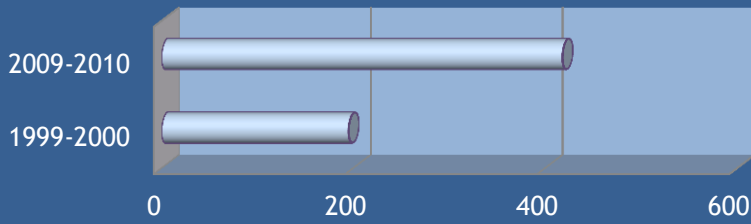
	1999-2000	2009-2010
■ M.S. Degrees	10	41

Fig. 7 Hampton University Ph.D. Degrees



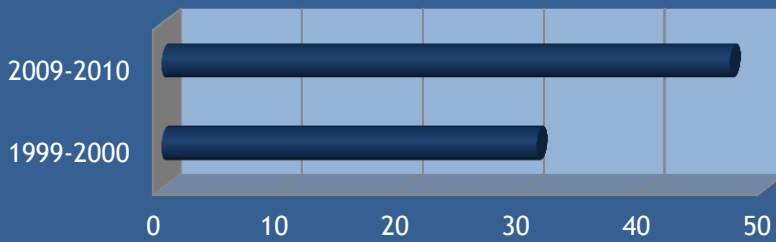
	1999-2000	2009-2010
■ Ph.D. Degrees	1	3

Fig 8. Howard University B.S. Degrees



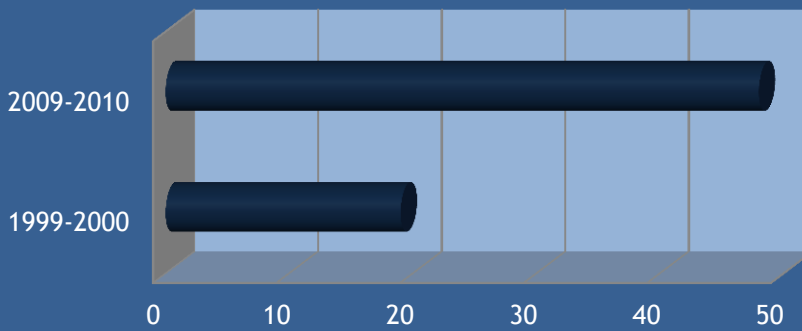
	1999-2000	2009-2010
■ B.S. Degrees	195	418

Fig 9. Howard University M.S. Degrees



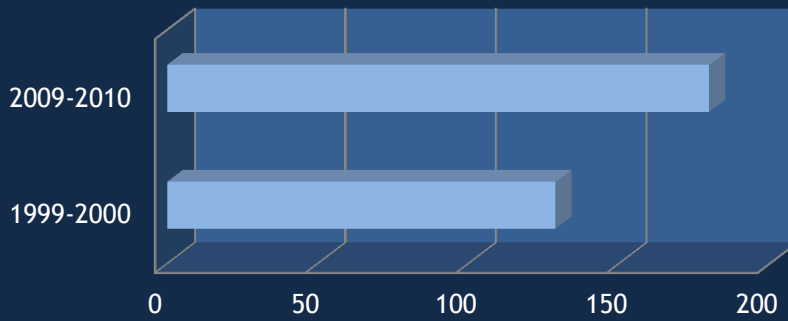
	1999-2000	2009-2010
■ M.S. Degrees	31	47

Fig 10. Howard University Ph.D. Degrees



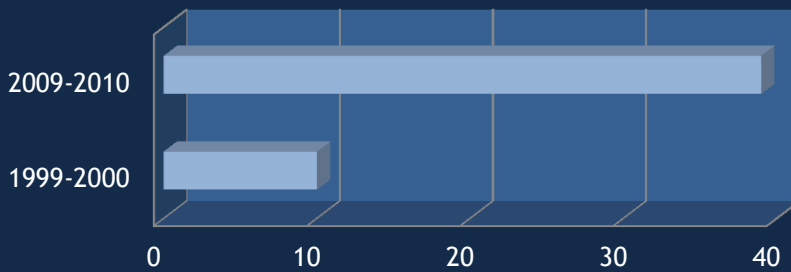
	1999-2000	2009-2010
■ Ph.D. Degrees	19	48

Fig I1. Morgan State University B.S. Degrees



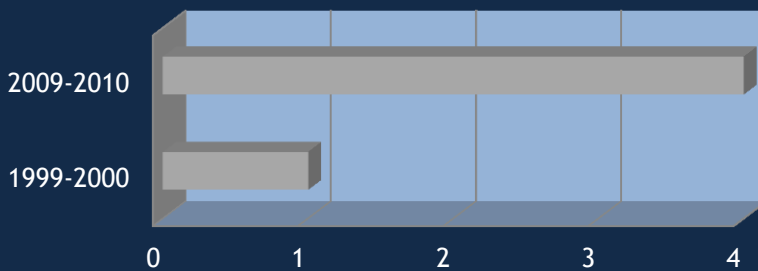
	1999-2000	2009-2010
■ B.S. Degrees	129	180

Fig I2. Morgan State University M.S. Degrees



	1999-2000	2009-2010
■ M.S. Degrees	10	39

Fig I3. Morgan State University Ph.D. Degrees



	1999-2000	2009-2010
■ Ph.D. Degrees	1	4

Fig. 14 Norfolk State University B.S. Degrees

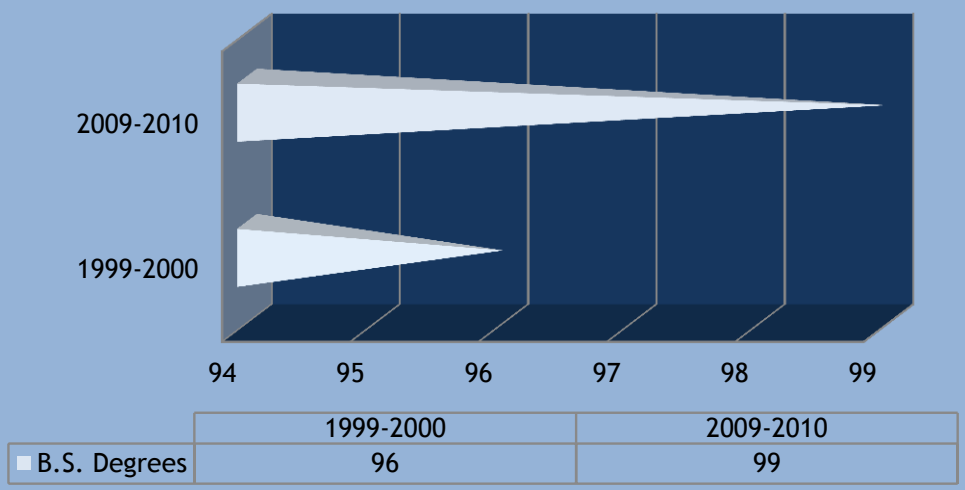


Fig. 15 Norfolk State University M.S. Degrees

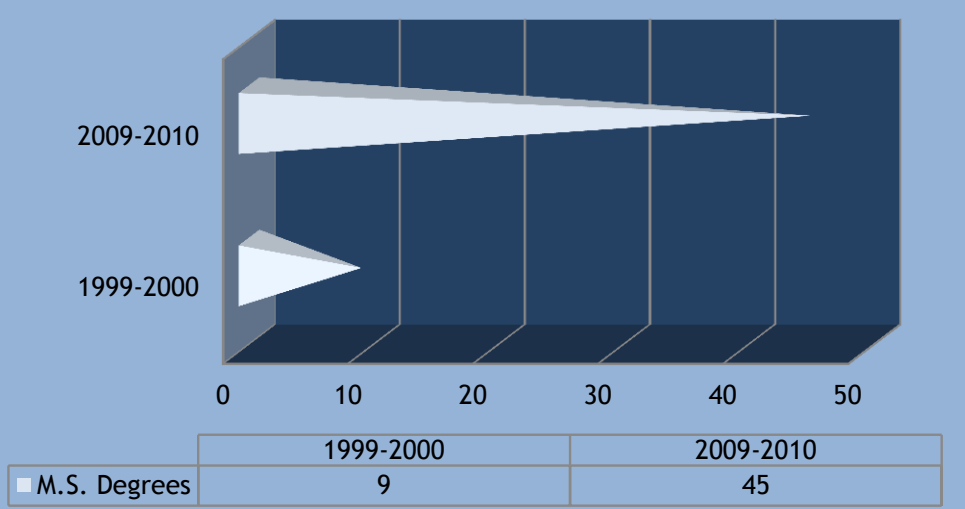


Fig. 16 University of the District of Columbia
B.S. Degrees

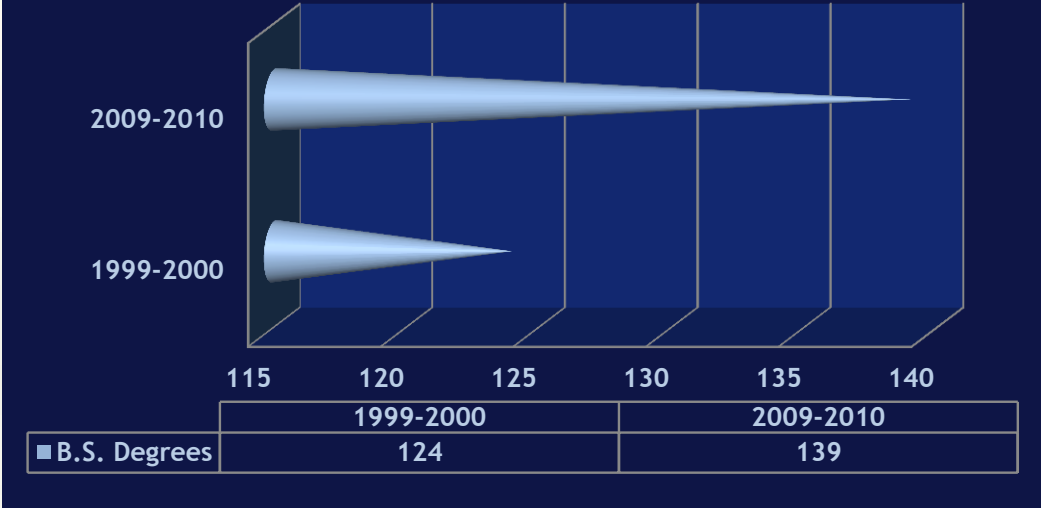


Fig. 17 University of the District of Columbia M.S.
Degrees

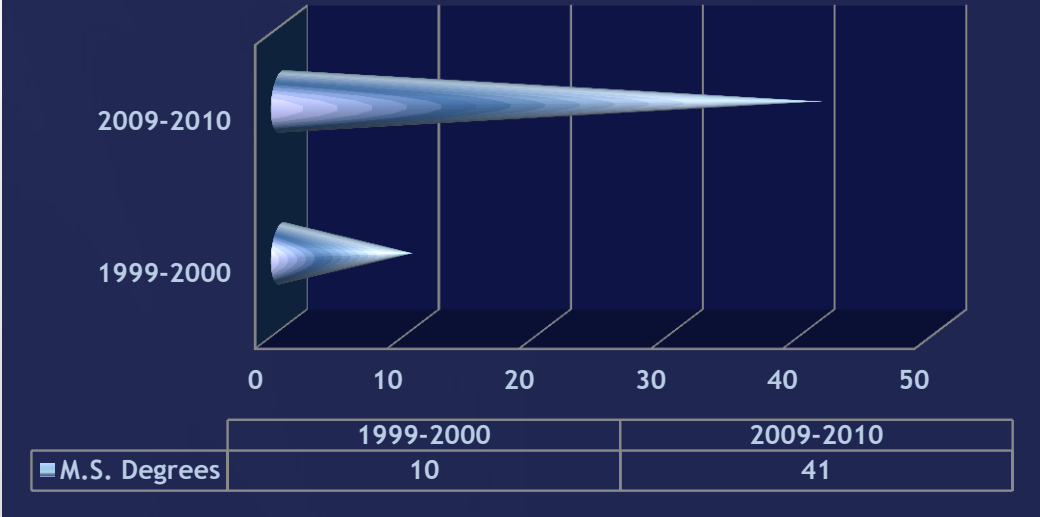
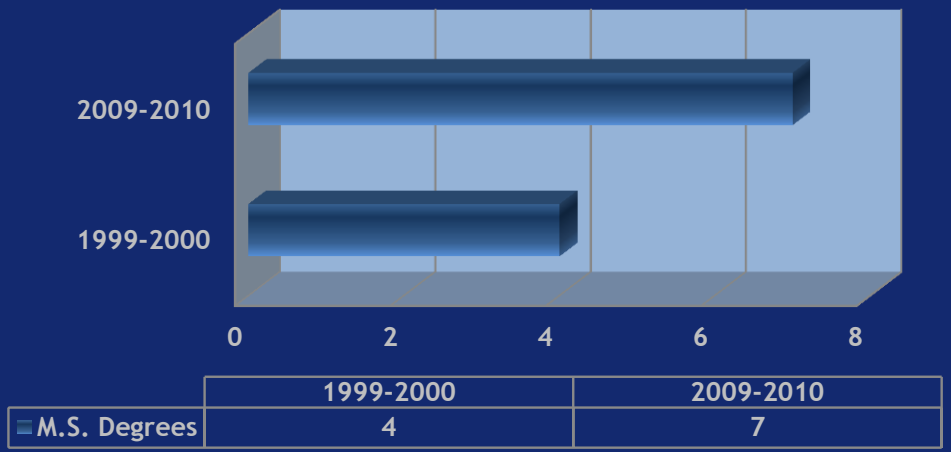


Fig. 18 Virginia State University B.S. Degrees



Fig. 19 Virginia State University M.S. Degrees

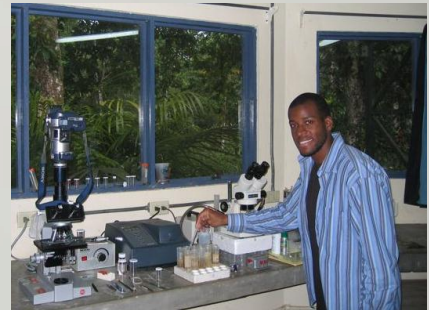


Outreach Activities of the WBHR-LSAMP Program



Dr. Justin Wilson, a recent Bridge to the Doctorate Physiology student visited Johannesburg and Capetown, South Africa with 20 other young leaders from Howard University and the University of Maryland. He worked in the village of Diesploot. Justin reports he experienced a life-changing event when the smiling faces of 200 young, innocent, beautiful, children greeted him in song and dance. He experienced first hand the impact of HIV/AIDS on an international setting and learned of many relief efforts and public health initiatives.

Dr. Thomas Hardy, a Bridge to the Doctorate Ph.D. student majoring in environmental ecology spent two years in the southern Talamancan mountain range of Costa Rica researching the invertebrate communities of tropical phytotelmata. The research uncovered many new findings. In addition to his research, he assisted undergraduate students in learning many new research techniques. As a new Assistant Professor at Virginia Union, Dr. Hardy intends to further support these findings with future research.



A Functional Alternative Spring Break (ASB) of Volunteerism

Last year, more than 300 Howard students passed up vacations in Florida or the Caribbean during their Spring Break and instead rolled up their sleeves to help families across America. Two of those students were members of the LSAMP program. They worked in five cities -- New Orleans, where thousands are still recovering from the devastation of Hurricane Katrina; Chicago, where gun violence haunts the footsteps of the city's children; Detroit, where nearly a quarter of the city's adults are functionally illiterate, and Washington, D.C., where many young people's dreams of a brighter future are clouded by despair. This year, they returned to those locations where they provided tutoring, cooked and served lunches and dinners, cleaned up lots and painted houses, provided legal assistance and other needed help.

"It is programs such as this one that serve multi-dimensional purposes and achieve multi-faceted goals which span the gamut of elementary children, communities of all ages, and lastly, students like myself who otherwise would only have had a view of the other side of the coin. The benefits of my mission to New Orleans were multi-faceted. First of all, being given the opportunity and distinct honor to participate in 2011's Alternative Spring Break, by assisting in the recovery of my New Orleanean compatriots, was time valuably spent. I utilized my practical and theoretical experiences in interior design and photography, especially, in my contribution to the astounding success of this ASB project. Apart from having the rewarding personal experience of self-growth and development, the entire dynamic of group cooperation, group living, and group travel, were indispensable. I will be able to reminisce upon the similarities to lessons learned, in addition to detecting and realizing growth from the differences" Omar Tulloch

New Orleans, Louisiana 2011: A Functional Alternative Spring Break (ASB)of Volunteerism - The Before and After (Fait Accompli)---- Omar Tulloch

“Our days were jam packed and each person’s schedule was air tight. We aimed to accomplish three different goals which called for the placement of three groups. Before leaving for Chicago, we chose to be in one of three groups: advocacy, tutoring, or creative arts. I was naturally inclined to choose advocacy where we would be petitioning for a Federal Assault Weapons ban.

The tutoring group would be interacting with middle school and high school students, while the creative arts group would be constructing a mural at Saint Sabina’s school. To stress the importance of the graveness and severity of the gun violence issue in Chicago, we were presented with multiple opportunities to interact with victims and victims’ families. As we arrived at the center named “Kidz Off the Block,” we could not help but notice a large memorial across the street from the building. We were greeted excitedly by the director of the program, Diane Latiker. She was almost in tears for the mere fact that Howard University cared enough about the gun violence issue to send students to Chicago to help. The “Kidz Off the Block” program does exactly what the name suggests. This non-profit organization provides at risk low income youth with alternatives to gangs, drugs, violence, truancy, and the juvenile justice system.

Our goal was the beautification of the block and the revamping of the memorial across the street. Due to the substantial amount of youth deaths, Ms. Latiker felt it was necessary for there to be tangible evidence of these lost lives to serve as a reminder of the brutality and savageness of the community. What started out as a few gardening bricks with names of fallen youth, became a memorial with over 200 names, we were told they “ran out of bricks” and the list is ever growing. The Chicago odyssey was more than I expected and its indelible memories will reside with me always” **Ryan Brown**





Ms. Kourtney Fulton, a fifth year Bridge to the Doctorate student majoring in mathematics was recently highlighted in a television news report on the impact of mentoring minority students in her hometown of Columbia, South Carolina. The video and following abstract can be viewed at the WLTX website <http://www.wltx.com/news/story.aspx?storyid=51668>

The Columbia Urban League's "Defy the Odds" Summer Camp (Columbia) - It's part of their Violence Prevention and Sex Education Camp.

"Give me an instance where you may have to hurt someone's feelings?" Instructor Kourtney Fulton asks her class. Thursday's lesson is refusal and no one knows that word better than 13 year old Angel Street. The Fulmer Middle School honor student has turned down unhealthy people and places to break her family cycle. "My parents were average, now my brother and I are honor students, doing things no one thought anyone in our family could do," Street says. Angel Street is convinced this camp will help her reach even higher. "It's teaching me the consequences of bad things and how I can make good choices," she adds. "She's very focused," adds Instructor Kourtney Fulton. Besides Sex Education and Violence Prevention, Fulton is teaching students job skills, planning, budgeting and more. The Howard University Graduate Student and Columbia native returns home from Washington D.C. every summer to set an example that otherwise may not be set. "I think it's important to come back and work with students that went to the same school I went to so they know they can defy the odds,"

Other Outreach Activities

▶ Howard University hosted the 50th Anniversary of Sigma Xi at the Blackburn Center in April, 2007. Sixty-five presenters attended this event and the national president of Sigma Xi was in attendance. At the annual meeting, many of the LSAMP and BD students are initiated into this national society.

▶ Howard University served as the host for the Annual District of Columbia Citywide Mathematics, Science and Technology Fair. Yearly, over one thousand students (1000) grades 6 through 12 in the public, charter, parochial and private schools participate in this annual citywide Mathematics, Science and Engineering Technology Fair. Students from the WBHR-LSAMP Program participate in this activity as judges.

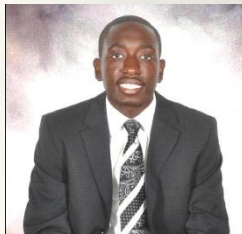
▶ Since the beginning of the WBHR-LSAMP program, over thirty students participated in the High School/ College Internship Program (HI/SCIP) at Howard University. The students had completed their junior year in high school and based upon their PSAT met the requirements for early admission to Howard University. This program is aimed at accelerating the admission of talented high school students into the STEM pipeline. Two of the HI/SCIP participants (Abena Brown and Aris Winger) entered Howard University as seniors in high school and successfully completed their Ph.D.s. in clinical psychology and mathematics.

▶ The WBHR-LSAMP program took the lead in organizing a Poster on the Hill Session for the members of Congress. Twenty six alliances participated in this poster session. The details of this session are discussed later in this publication.

WBHR-LSAMP Community College Activities

It is a primary goal of WBHR-LSAMP to create pathways to a STEM baccalaureate for students at community colleges, by including them in WBHR-LSAMP summer programs and academic-year courses. This serves to facilitate the community college student's transfer into STEM B.S. programs at WBHR-LSAMP institutions. There are a number of avenues by which WBHR-LSAMP Alliance Partners work to achieve this goal. They sponsor programs for students and employ assistance from other institutions including establishing Memorandums of Understanding, Articulation Agreements, and STEM Transfer Agreements with schools to aid students from community colleges in their transition to baccalaureate studies. Further, participation with community groups in college fairs allows Alliance Partners to further facilitate attainment of this goal.

The WBHR-LSAMP Community College Transfer Scholarship Program was developed in support of this ambition. This program selects students that show great potential in their studies as WBHR-LSAMP Community College Scholars. This program provides them with a \$1,000 scholarship during their first year in the WBHR-LSAMP Alliance. Students are afforded the opportunity to participate in a program of activities during their first year. This program has been developed in conjunction with the LSAMP coordinator.



Michael Ongele is a senior at Howard University in Washington, D.C., where he is pursuing a Bachelor of Science degree in Biology. Michael transferred from Prince George's County Community College, and is currently a LSAMP scholar working in the Howard University College of Medicine on DOCA-salt induced hypertension and the role of pro-inflammatory cytokines in rats. Upon graduation, Michael plans on matriculating into medical school where he will pursue a MD/Ph.D. and looks forward to becoming a critical care internist in the Washington, D.C. area.

Michael is a Summer Medical and Dental Education Program (SMDEP) alumni of the Duke University School of Medicine site in Durham, North Carolina where he participated in a rigorous six-week summer program, which exposed him to the field of medicine and provided him with a substantial amount of laboratory experience.

In consideration of the primary goals, Alliance partners plan and host activities designed to increase transfer rates of URM (underrepresented minorities as defined by the National Science Foundation) students from the WBHR-LSAMP Community Colleges into STEM majors at the alliance schools.

Virginia State University (VSU) sponsors the Summer Transitions and Enhancement Program (STEP). This program provides a smooth transition for participants from community college to four year universities. The participants are enrolled in one math and freshman English courses. The students receive scholarships as long as their GPA remains above 3.0 and they pursue a STEM discipline as their major. Hampton University offers community college STEM

Scholarships of \$1500. The scholarships are awarded to community college students who have completed at least one semester of coursework and are pursuing a program of study in STEM and indicate an interest in aerospace. In the same connection, Morgan State University had a total of 527 transfer students (most from community colleges) in the fall 2011 semester. Honors Program data indicates that a total of 190 honor students transferred into Morgan's Honors Program last year. They received \$1,566,595 in scholarships and \$88,500 in book scholarships.

Norfolk State University (NSU) has innovative approaches to achieving program goals; these include the FIRST Tech Challenge and the STARS Summer Research Program.

FIRST Tech Challenge



NSU hosted the Eastern Virginia Qualifying Tournament for the FIRST Tech Challenge (FTC) Tournament, Saturday, January 14, 2012. This event brought over 200 high school students, parents, and high school teachers to NSU. Many of the students had a strong interest in STEM careers. It also provided a wonderful opportunity to positively influence potential science, engineering, technology, and mathematics (STEM) students, including their

parents and teachers. Its mission is to "Inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership." NSU invited 18 students from Tidewater Community College to serve as FIRST volunteers where they played an important role in making FIRST's vision a reality to its participants.

STARS Summer Research Program

NSU students are actively involved in conducting undergraduate research to advance their STEM knowledge beyond the scope of classroom material. This program provides intellectual challenges, and experiences in the scientific methods of investigation, problem solving, and state-of-the-art experimental procedures,



independent as well as teamwork. Student requirements include: 1) working collaboratively with a faculty research mentor during the academic year or summer, 2) participating in bimonthly technical oral presentations; presenting weekly progress reports during the summer session, 3) delivering technical presentations at regional and/or national symposiums, and 4) preparing oral/poster presentations and final technical reports. The STARS-Plus Summer Research Experience serves as an umbrella program to several research programs within CSET at NSU. Students performed research in Creative Gaming and Simulation Laboratory, Center for Biotechnology, Clean Room/Engineering, Electronics/Optical Labs, and Center for

Materials Research, and NASA Langley Research Center. Students are invited from Tidewater Community College yearly to work collaboratively with a research advisor and attend summer research competitions.

All of the WBHR-LSAMP partners are seeking to establish more articulation agreements and Memoranda of Understandings (MOU). We are proud to report that Norfolk State University (NSU) established articulation agreements with the following community colleges:

Thomas Nelson Community College	Patrick Henry Community College
Community College of the D.C.	Tidewater Community College
Eastern Shore Community College	Lansing Community College
Paul D. Camp Community College	Richard Bland College

Six STEM transfer program agreements were signed with Thomas Nelson Community College which are listed below:

Applied Mathematics	Biology
Chemistry	Computer Science
Electronics Engineering	Physics

NSU also signed 2 formal Memorandum of Understandings (MOU) with Tidewater Community College and Paul D. Camp Community College.

LSAMP Pilot Bridge the Gap Computer Science Program

The students at University of the District of Columbia (UDC) Community College are fully integrated into the UDC LSAMP program. These students participate in summer programs; this participation often encourages them to take courses at the main UDC campus. Some UDC Community College students participated in the summer LSAMP Pilot Bridge the Gap Computer Science Program, this program has been designed for students progressing from a Spring semester Introduction to Programming course to a Fall semester Computer Science I course who showed difficulty in completing the course.



Bridge the Gap Computer Science student Justin Bradley



Bridge the Gap Computer Science Student (L-R) Aldrin Peralta, Justin Bradley, Ashenafi Lambedo, Morgaga Timbo, and Kafayat Olayinka



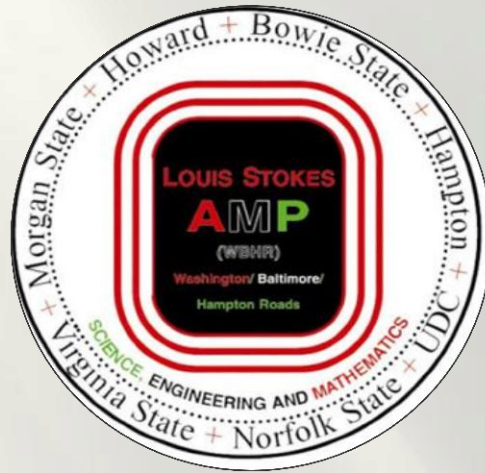
UDC CC student Morgana Timbo attending a lecture on Cryptography at UDC, jointly sponsored by LSAMP and "the robotics club"

UDC Community College students also attended two Fall 2011 colloquia jointly sponsored by LSAMP, the STEM center and the Office of Research and Graduate Studies, and three presentations sponsored by LSAMP and "the robotics club" at UDC. The students who attended included those who had participated in the summer program, and friends that they encouraged to join them.

WBHR-LSAMP Alliance partner Bowie State University (BSU) is proud to announce their participation in the new Math Science Partnership Minority Student Pipeline program. The Math Science Partnership Minority Student Pipeline (MSP) 2 is a five year, \$12.4 million grant funded by the National Science Foundation. BSU will serve as the Lead Institution with Dr. Anisha Campbell as the Principal Investigator. Participating partners include University of Maryland, College Park (UMCP), Prince George's Community College (PGCC), Towson University (TU), and the Prince George's County Public School System (PGCPS). The goal of the grant is to create a pipeline for bringing more minority students into STEM fields of study via a four-fold approach that includes:

- Professional development programs created by University of Maryland, College Park (UMCP) and Prince George's Community College (PGCC) for teachers in grades 4-8 designed around principles of teaching and learning through inquiry science.
- Summer research experiences for Prince George's County Public School System (PGCPS) high school science teachers with BSU, TU, and UMCP faculty.
- Mentored teaching experiences for 100 undergraduate underrepresented minority students coordinated by UMCP and 50 undergraduate research experiences through BSU.
- Early college/dual enrollment science courses through BSU and PGCC for at least 250 PGCPS high school students over five years.

WBHR-LSAMP STUDENTS



RESEARCH PARTICIPATION, SYMPOSIA, AND OTHER ACTIVITIES

More than 350 students participate in the summer symposia sponsored by the WBHR- Alliance each year. Furthermore, there has been an increase in the number of students participating in undergraduate research at the Alliance member institutions as well as at other major universities and national laboratories. Many of the top prizes awarded are won by WBHR-LSAMP students.



Dr. Christian d'Orgeix and Nakeshia Bridges



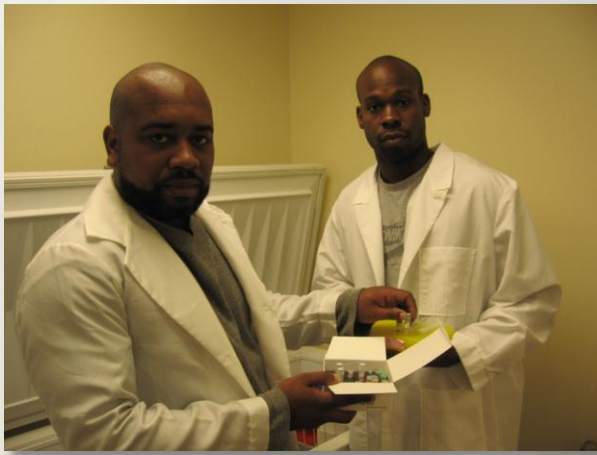
Dr. Nasser and A. Hassan



Dr. Colleen Taylor and Sharon Francis



Dr. M Omar Faison and Dwight Parrish



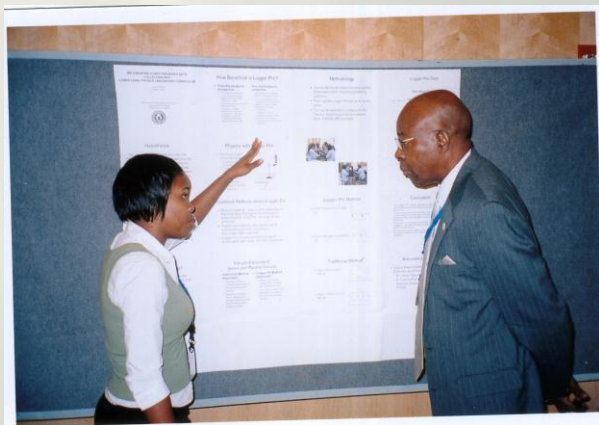
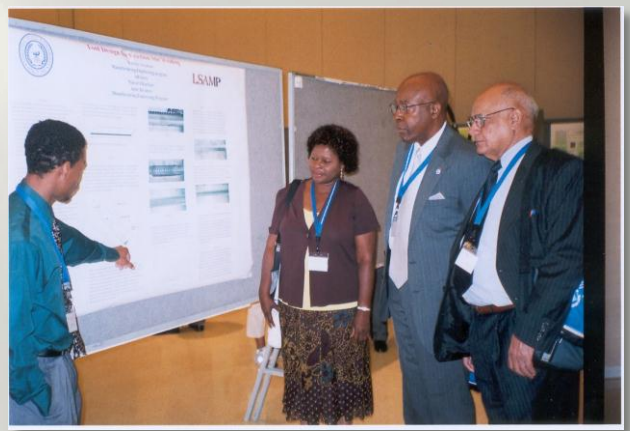
Dr. M Omar Faison and Dwight Parrish

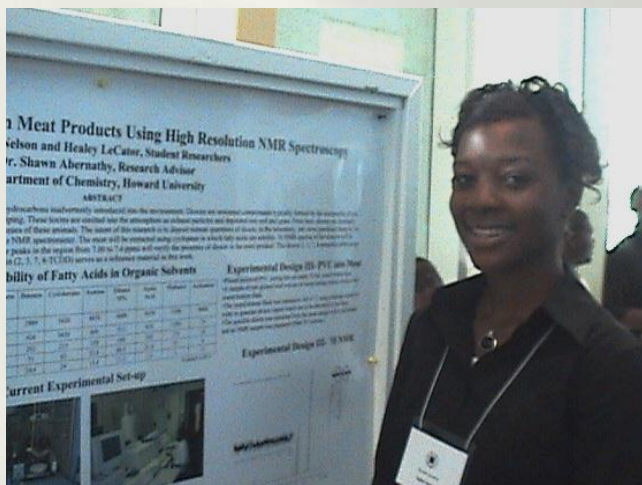


Dr. M Omar Faison and Jaidalyn Rand

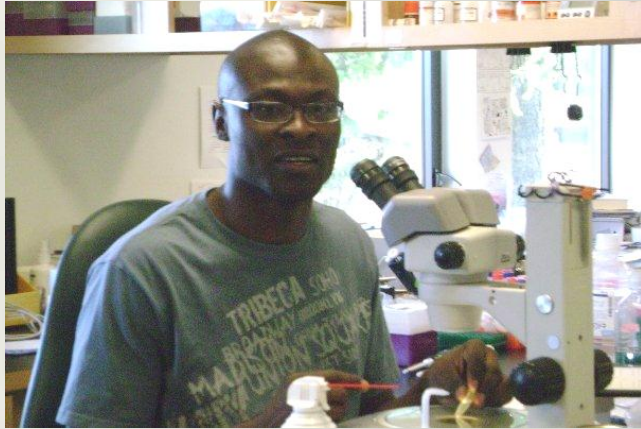


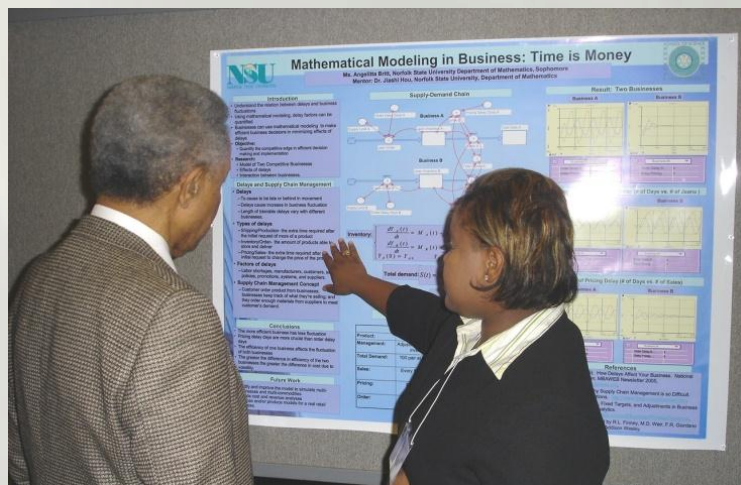
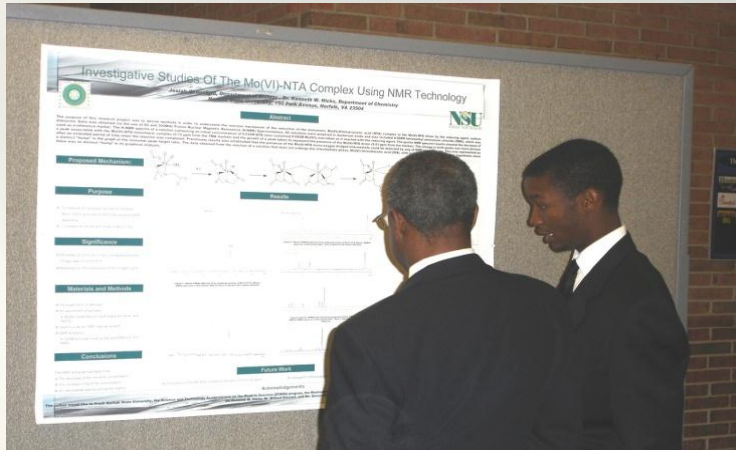
Dr. Clarence M. Lee, Executive Director of Washington Baltimore Hampton Roads Louis Stokes Alliance for Minority Participation Interacting with Students at various symposiums and other events.











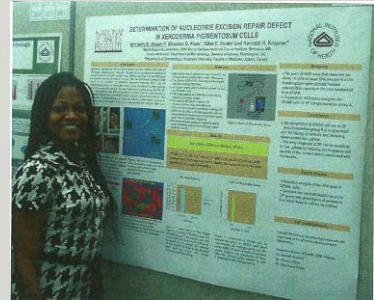
Under the leadership of the Washington Baltimore Hampton Roads-Louis Stokes Alliance for the Minority Participation (WBHR-LSAMP), Howard University has enrolled sixty (60) Bridge to the Doctorate (BD) students in the first five classes in various STEM disciplines. We are pleased to report that these students are meeting our high expectations and making satisfactory progress toward the completion of their doctoral degrees.

Bridge to Doctorate Statistics

Admitted to the BD Program	60
Admitted to the Ph.D. Program	50
Admitted to the M.S. Program	10
Earned M.S. degrees	10
Earned M.S. degrees and entered Ph.D. Program	7
Earned Ph.D. degrees	13
Expecting Ph.D.s in 2013	10
Left Ph.D. and entered workforce	4

Some of the cutting edge research studies undertaken by our BD students are detailed below:

1. Sandra Dillahunt is working on functional characterization of human and mouse sphingosine kinase 1 and 2 using short hairpin RNA. Sphingosine-1-phosphate (S1P) is a lipid second messenger and a autocrine/paracrine mediator generated by two sphingosine kinase isoforms: sphingosine kinase 1 and 2 (SphK1 and SphK2). Upon mast cell activation, SphK1 and SphK2 are translocated to the plasma membrane where they are able to phosphorylate sphingosine to produce S1P. Studies using mouse models with genetic deletions in SphK1 or SphK2 have shown that SphK2 is critical in influencing mast cell degranulation, cytokine production, and calcium responses, but showed no role for SphK1. However, studies using siRNA for SphK1 and SphK2 in cord blood derived human mast cells and human LAD2 cells have shown a predominant role of SphK1 in the degranulation response and chemotaxis towards antigen, while SphK2 is important for cytokine production. To further elucidate the individual roles of each kinase in mast cell responses, and to determine whether SphK1 and SphK2 differ in their functional roles depending on the mast cell population, the experimental conditions, or the species of origin, short hairpin RNA (shRNA) constructs are used to knockdown expression of SphK1 and SphK2 in CD34+ human mast cells and bone-marrow derived mouse mast cells.



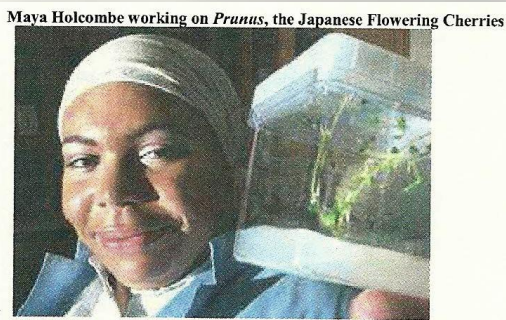
Kimberly Mason presenting her Ph.D research at National Conference at NIH

2. Mellissa Fletcher's research is on the detection of benzopyrene-deoxyguanosine adducts by matrix assisted laser desorption/ionization time of flight mass spectrometry. In this research, a method for the detection of BPDE-d guanosine adducts using matrix-assisted laser desorption/ ionization time-of-flight mass spectrometry (MALDI-TOFMS) is described and illustrated.

3. Adana Llanos studied the associations among plasma adiponectin, leptin, folate, and IGF-1 and age and BMI in women undergoing reduction mammoplasty. This study investigated the associations among plasma concentrations of adiponectin, leptin, and IGF-1 and their associations with age and BMI. These associations were investigated in a population of women (who have never been diagnosed with breast cancer) undergoing reduction mammoplasty at Georgetown University Medical Center.

4. April McLaughlin took on a significant project involving FoxP3 and CTLA-4 Expression in Tumor and Natural T Regulatory Cells as a Mechanism of Prostate Tumor Escape and Progression. The reason for this research is stimulated by the fact that prostate cancer is the most common cancer in men in Europe, North American and parts of Africa, and is a leading cause of death among men in the United States and Western Europe. Overall the incidence of prostate cancer in the U.S. between 1997 and 2001 was 175.5 per 100,000 persons, with African Americans having the highest incidence (274.3 per 100,000 persons). For that same period of time, the death rate for African American men was almost three time that of white men. Some studies suggest a more aggressive cancer in African American men than in white men. The reason for the disparity is not completely known, however there may be several biological factors involved including variation in immune system activity.

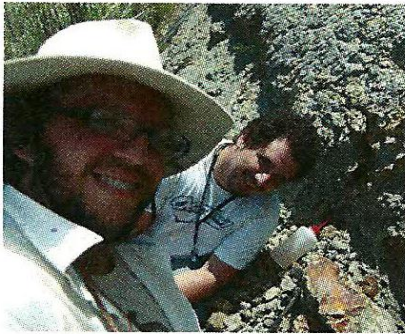
5. Thomas Hardy seeks to understand how abiotic and biotic factors influence species diversity within a given temporal and spatial domain. This can be particularly challenging in the tropics, where high species density (and limited taxonomic information) make biologically relevant changes in species richness difficult to detect or interpret. One way to overcome this problem while still testing interesting and relevant hypotheses was to focus on small systems with discrete boundaries. Thomas was interested in *Phytotelmata*, the faunal communities found within water-retaining structures of plants. Common *Phytotelmata* are commonly found in bromeliads, which retain large amounts of water in the center of their rosettes, and heliconia, which hold pools of water in their bracts. These small pools can be home to a number of small arthropods and aquatic plants. *Heliconia* can have numerous such pools per inflorescence and numerous inflorescences per plant, so they can have many different communities in each plant.



6. Maya Holcombe is working on the comparative DNA- fingerprinting of Japanese Flowering Cherries. Flowering cherries have pink and/or white blossoms and a delicate sweet scent. These ornamental trees possess over 200 species belonging to the genus *Prunus*. There is a great confusion over their naming and identification due to the abundance in species. Amplified Fragment Length Polymorphism (AFLP) markers are used for type identification of these important nursery plants. Tissue samples of flowering cherries were collected and maintained at -20°C. Genomic DNA extractions from frozen tissues were conducted by utilizing DNeasy Plant Mini Kit (Qiagen, Santa Clara, CA) and grinding matrix along with Bio Fast Prep System (Q. Biogene, Irvine, CA). Quantifications of the pure DNA samples obtained were done by using a spectrophotometer (Eppendorf, Hamburg, Germany). AFLP analyses require restriction digest, ligation of adaptors, pre-amplification, and amplification of the plant genomic DNA samples. DNA extractions and samples from all AFLP analyses steps were confirmed by agarose (1%) gel analyses and photographed using Alphamager 2000 system (Alpha Innotech, San Leandro, CA).

7. Monique Calhoun is currently doing research on the absolute calibration of the Howard University LIDAR system using a lamp calibration technique. In the fall of 2009 she had the opportunity to participate in a MOHAVE research field campaign at the NASA Jet Propulsion Lab in Table Mountain California. This campaign consisted of research of the water vapor behavior in the troposphere using Radiosonde, LIDAR and other instruments.

8. Samelia Okpodu joined Neurobiology-Neurodegeneration Repair Laboratory in the National Eye Institute and is investigating the role of planar and epithelia polarity in photoreceptor development, structure, and function. Her training and dissertation work will be completed under the supervision of Dr. Anand Swaroop. She has traveled to France and Germany on several occasions as an invited presenter and as a Partnership for International Research and Education Fellow.



At left, Alvin Bonilla(on the rocks) (University of Kansas) and Velez-Juarbe work on a sirenian mandible that they found in north central Puerto Rico.

Though the original partners; Howard University, Morgan State University, and the University of the District of Columbia have long standing study abroad programs, no formal records were kept to document the participation of STEM majors in these activities. This changed in 1998, when one of Howard's Civil Engineering students was awarded the Rhodes Scholarship, having so great an honor bestowed to one of our own, Principles gave greater attention to the work being accomplished.



Commissioner Carla Peterman

Carla Peterman, a Howard University Graduate in Civil Engineering and Rhodes Scholar in 1998 from Howard University

"Thinking Outside the Module: Innovations in Climate Change Policy and PV Technology" April 2011 Carla Peterman's primary research interests are renewable energy technology innovation and climate change mitigation policy. Her dissertation research focuses on market transformation activities in the U.S. Solar Photovoltaic (PV)

market. She conducts economic and policy analysis on factors such as government financial incentives and endogenous learning that are intended to lower the cost, and increase the deployment, of PV. Her dissertation research focuses in particular on non-solar panel price drivers for residential solar power systems. These Balance-of-System components and costs such as inverters, other hardware, installation labor, permitting and documentation, contribute to over half of the final solar PV system price faced by customers. These costs are key and under-researched areas that state and local renewable energy policies can influence. Drawing upon the fields of Innovation Theory, Energy Markets, and Distributed Generation Technology and Policy, Carla aims to better identify the complex value chain for solar PV and expand upon the existing conceptualization of the innovation process.

Carla currently serves as a Commissioner at the California Energy Commission. She was appointed for a five year term by Governor Jerry Brown in January 2011 to this position. She fills the Public Member position on the five-member Commission where four of the five members by law are required to have professional training in specific areas - engineering or physical science, environmental protection, economics, and law. Commissioner Peterman currently presides over the Energy Commission's Renewable Committee, is the Associate Member on the Electricity and Natural Gas Committee, and represents the Commission and state on a variety of west-wide energy planning initiatives.



ERG PhD candidate, Carla Peterman
at the CPUC

2000, as a Rhodes Scholar, Carla developed an interest in renewable energy and policy mechanisms to mitigate climate change while pursuing a Msc. in Environmental Change and Management and a Masters' of Business Administration at Oxford University. She expanded her business skills and knowledge of the electricity sector by working as an investment banker for the Power group at Lehman Brothers and as a business analyst for Isles, a community development non-profit

Carla has a long-standing interest in environmental, consumer protection, and environmental justice issues beginning during her undergraduate education at Howard University where she studied environmental studies and founded the Howard University Environmental Society. She continued her work on specific environmental issues and consumer protection as a board member for TURN, a California utility watchdog and consumer advocacy non-profit from 2008-2011 and as a current member of Howard University's Environmental and Sustainability Council.

Carla values ERG and UC-Berkeley for their first-class expertise in a range of fields, supportive and incredibly bright classmates, and numerous opportunities for applied work. As an ERG doctoral student, Carla has co-authored reports for the government, assisted with writing testimony for the U.S. Congress House Committee on Oversight and Government Reform, interned at the California Public Utilities Commission, and co-authored a paper on California climate change policy for the University of California Energy Institute CISM working paper series. Carla is thankful for the mentorship from a host of faculty including her qualifying exam committee: Alex Farrell, Dan Kammen, Margaret Taylor, and Catherine Wolfram; her dissertation committee, Catherine Wolfram, Dan Kammen, and Severin Borenstein; the Energy Institute at Haas; and Ryan Wiser of the Lawrence Berkeley National Laboratory.

Ms. Peterman has benefited from a number of funding and work opportunities available through the University of California Berkeley. She is the recipient of a Chancellor's Fellowship, and received support through her positions as a research assistant at the University of California Energy Institute and with the Electricity Markets and Policy Group at the Lawrence Berkeley National Laboratory.

Tamara L. Battle, a 2nd-year fellow with the NSF GK-12 Fellowship and graduate student in the Howard University Program in Atmospheric Sciences (HUPAS), worked in conjunction with several national and international scientists during the 2006 NASA-African Monsoon Multidisciplinary Analyses (AMMA) field campaign. The international research experience occurred from July – September 2006 and was based in Senegal, West Africa and Sal, Cape Verde. The mission was designed to study several areas of the atmospheric sciences, including hurricane genesis, the Saharan air layer, and precipitation processes over West Africa during the monsoon season. Dr. Gregory Jenkins, Associate Professor at Howard University, is a Co-PI with the NSF GK-12 Fellowship and participated in the campaign as a coordinator for the ground measurements in Senegal, Africa, researching differences in precipitation processes over West Africa.

Meteorological measurements, including radiosonde deployment, radar reflectivity, and assessment of the rain gauge network were also part of the campaign. During the 2006-2007 academic year, Ms. Battle was able to develop presentations for middle school students on research activities conducted in Africa. Ms. Battle and Dr. Jenkins returned to Senegal in June 2007, with the goal of identifying and engaging local primary and middle schools to work with colleagues at Cheikh Anta Diop University, Dakar, Senegal teaching research skills in atmospheric sciences to students. The next phase will include bringing teachers from the United States to Senegal next year to share in the research and teaching experience, as well as to address various issues such as long-term drought, precipitation characteristics in a coastal environment, linkages to hurricanes and other studies, and differences in cultural and societal needs regarding K-12 students in Senegal vs. the United States.

Despite the challenges faced during the field campaign, including lack of equipment and resources for follow-up and continuing long-term measurements, outcomes from this research experience included determining linkages between Saharan dust and tropical cyclone formation (hurricane formation); identifying the vertical structure of the Saharan air layer, and identifying precipitation characteristics in Senegal. Most importantly, these measurements are the first of their kind for West Africa and the extreme eastern tropical Atlantic. Dr. Jenkins and Ms. Battle were also able to present some of this work at national meetings including the 86th Annual Meeting of the American Meteorological Society, and are currently working with Dr. Jenkins on several publications of their findings. The GK-12 program at Howard University is just another way that the LSAMP Program collaborates with other NSF programs on campus.

International Interdisciplinary Research Facilities in a Scientific US-Senegal Partnership- Hampton University has led an International Partnership with Senegal since 1999 with support for LSAMP Student Research.

There is an international partnership of more than 70 countries that aims at constructing two international research facilities located in the United States and Africa. The US-based facility will host a multi-ultra fast laser system and the African-based facility two proton accelerators.

A partial list of the participants include: Drs. Paul Guèye (Hampton University, Virginia), Oumar Ka (University Cheikh Anta Diop, Senegal), Wendell Hill (University of Maryland College Park, Maryland), Keith Jackson (Florida A&M University, Florida and now at Morgan State University), Anthony Johnson (University of Maryland Baltimore County, Maryland), Lawrence Norris (National Society of Black Physicists, Virginia) and Quinton Williams (Jackson State University, Mississippi).

Background

Initiated in 1993 in Senegal (West Africa), this project had spun off to the US in 1999. Since then, three meetings were held (American Physical Society in 2002, National Science Foundation in 2003 and Senegalese Government in 2003), and four workshops were organized (three in the US - Hampton University in 2004, Jackson State University in 2005, and during the National Society of Black Physicists in 2006 -- and one at the World Congress on Medical Physics and Biomedical Engineering in Seoul, also in 2006). The current development of this partnership includes drafts for a full design of all systems at each facility, as well as the physics and educational programs to be implemented.



Front view of the international research facilities (courtesy of Archi Design).

Both facilities were developed to provide multi-disciplinary research centered on a common technology, ultra fast laser for the US and proton accelerators for Senegal. The project aims at providing a tool for scientists where interdisciplinary aspects could be shared to answer fundamental issues in science.

Similarly, the Senegal facility was conceived for scientific capacity building and equally to act as a focal point aimed at using the local scientific expertise. An anticipated outcome would be a contribution to the reduction of an ever-growing brain drain process suffered by the country, and the African continent in general. The past few years has seen the involvement in the project of a group of highly qualified scientists from various fields (e.g., materials science, atomic physics, physical chemistry, and medical physics). The eventual development of the idea led also to a strong African orientation of the facility, much in the philosophy of the New Partnership for Africa's Development (NEPAD). Indeed, although built for international collaboration, it is to be a pan-African endeavor (i.e., located in Senegal but to serve primarily African countries).

The US facility will host a complex ultrafast laser system. These types of lasers have typically a micron spot size, a few tens or hundreds of femto seconds in time duration and can have up to Peta Watts of power. Applications of such ultrafast lasers range from astrophysics and nuclear/high energy physics to plasma physics, optical sciences, biology/medical applications, and materials science. The proposed facility will have four primary beamlines: a low power line [0.1 Tera Watts, 1 kHz], a medium power line [10 Tera Watts, 9 kHz], a high power line [100 Tera Watts, 10 Hz] and an ultra-high power line [500 Tera Watts, 10 Hz]. Each line will comprise five experimental rooms to conduct this multidisciplinary physics research program. This facility will be the first ever of its kind in the world and dedicated to elevate the scientific community to a level never achieved before.

The Senegal facility, which received a presidential approval in a 2003 meeting, will develop an activity driven by an interdisciplinary program. The research program has been built around the on-site expertise, with the involvement of a dozen of scientists with broad international experience (Japan, France, US, Germany, Italy, etc). The facility will also address specific environmental issues for African countries through a devoted component. A major part of the activity of the facility will be centered on state-of-the art accelerator mass spectrometry and cyclotron systems. The type of physics research to be carried out in this facility will consist of material sciences, Rutherford backscattering spectrometry, particle induced X-ray emission, ^{14}C dating, cancer and ophthalmology treatments, as well as strangeness nuclear physics. The cyclotron will provide the tool for not only an accurate technique for staging and therapeutic monitoring in oncology, but also to help with diagnosing and staging of various diseases, especially in the area of cancer.

Both facilities are committed to providing strong educational training facilities for pre-college (K-12) and college students, as well as various outreach and collaborative programs (including exchange of students and faculty, local and international, to establish and sustain a strong research collaboration). These science-related activities are necessary to contribute in solving the important need for national education of young scientists. In particular, these facilities will continue to foster the need for underrepresented scientists in certain fields by creating a pipeline between K-12 students and colleges.

The economic and political impact of such facilities will be unprecedented in providing a unique tool for establishing partnerships in these areas. A multicultural exchange would now be possible between all continents involved at a level never attained before. Not only would international exchange of both students and faculty permit the implementation of dual or joint degrees, but also allow access to highly qualified personnel for the workforce.

Morgan State University worked as part of the “ Growing the Future, Leading the World” initiative to enhance and diversify the learning experiences to better prepare students to respond to the needs of our diverse global society. In working to conquer this challenge, Dr. Arlene Maclin, Adjunct Professor of Physics secured a planning grant from NSF in 2010. The report of the results of that planning trip to Finland and the follow-on activities are discussed below:



During the period of October 10- 16, 2010 a group of six people including three people from Morgan State University (MSU) : Dr. Joseph Whittaker, Dean of the School of Computer, Mathematical & Natural Sciences (SCMNS), Dr. Arlene Maclin, PI and Dr. Gregory Wilkins, co-PI and from the University of Arizona: Dr. Meredith Kupinski, co-PI and Adam Jones, graduate student and Oscar Herrera, graduate student from the NSF –funded Engineering Research Center for Integrated Access Networks (CIAN) went on the trip to Helsinki, Finland. The members were graciously hosted by Distinguished Professor Seppo Honkanen at Aalto University in Helsinki, Finland for the entire week.

The team received numerous briefings by researchers at MicroNova, the National Laboratory-VTT, and other professors at Aalto University. The team also visited many business owners in the village called Otaniemi, which is where the National Laboratory, Aalto University and more than 800 corporate centers are located. Within the Otaniemi Village, there are more than 16000 undergraduate and graduate students and another 16000 professionals in a 4 km² area. This close proximity of businesses, the university and a national laboratory is a living laboratory for technology innovation and creativity.

Though most of the Department of Energy Laboratories are administered by universities in the United States, there is no region that resembles this organizational arrangement, where students, faculty, business owners and corporate headquarter and scientists and engineers interact on an almost daily basis. Most of the students at Aalto University in Finland participate early in their college careers in cooperative work experiences with businesses and the national laboratory. This is common for students in all majors, not just those with majors in STEM areas. This may lead to the fact that many students in Finland make decisions about interdisciplinary careers. In addition, there is a center for entrepreneurs or a business incubator that any student may participate in for starting a company. Additionally, there is informal space where students, faculty and scientists and engineers can sit for coffee, tea or just for informal conversation.

As a follow-on to the trip to Finland, Morgan State University and Aalto University submitted companion proposals to establish research collaborations to the National Science Foundation and the Academy of Finland respectively. The PI presented a paper on this trip at the American Physical Society International session in Dallas, Texas in March, 2011.

Adam Jones, a final year PhD. student at the University of Arizona and Ronald McNair Scholar thought that “As we move forward, we find that science and engineering is becoming an increasingly global enterprise. As such, the ability to interface with foreign cultures quickly in an amiable way becomes increasingly important. A significant benefit to this experience comes from the fact that the planning meeting was held in Finland. Being on foreign soil and adapting to a foreign culture can be difficult and becomes easier with experience. I feel that this was one of the few opportunities where a student could participate in such an event in a somewhat observational position”. Additionally, Oscar Herrera, a 3rd year graduate student at the University of Arizona and Ronald McNair Scholar stated that “My expectation for the trip was that I would observe the facilities available at Micronova and tour the beautiful historic Helsinki. However, after listening to the devotion and passion the faculty and administrators had, it inspired my further involvement. The focus of the project was to increase the involvement of undergraduate and graduate students in international collaboration. It is good to see how dedicated the faculty are towards their students, which is not always evident in a classroom environment. This is the type of attitude needed to initiate and encourage relationships between foreign universities”.

In addition, a presentation on the International Activity on behalf of CIAN was presented at the site visit for the three –year NSF-funded Engineering Research Center at the University of Arizona. In that presentation, we proposed that one possibility to fund follow-on collaborative research among MSU, Aalto University and CIAN would be an NSF Partnership for International Research and Education (PIRE) grant.



This planning visit allowed Morgan State University an opportunity to begin establishing international opportunities for research for a whole new generation of students. A memorandum of understanding is pending for the establishment of international exchange for faculty and students between Morgan State University and Aalto University. We gratefully acknowledge the support of the NSF and all of the collaborators for this opportunity.

At the University of the District of Columbia, Assistant Professor Nian Zhang, Ph.D, Department of Electrical and Computer Engineering, is well-connected to the international community in electrical engineering and computer science.

Dr. Zhang's research interests and expertise are neural networks, fuzzy logic and their applications in autonomous robot navigation, signal processing, and renewable energy.

Dr. Nian Zhang received her B.S. in Electrical Engineering at the Wuhan University of Technology in 1996, M.S. in Electrical Engineering from Huazhong University of Science and Technology in 1999, and Ph.D. in Computer Engineering from Missouri University of Science and Technology in 2004. She was an Assistant Professor in the Department of Electrical and Computer Engineering at South Dakota School of Mines and Technology (SDSM&T), Rapid City, from 2004 to 2009. She is currently an Assistant Professor in the Department of Electrical and Computer Engineering at the University of the District of Columbia, Washington D.C., USA.

Dr. Zhang is an Associate Editor of IEEE Transactions on Neural Networks since 2010. She was a Co-Editor of the Advances in Neural Networks - ISNN2009, and a Guest Editor of International Journal of Systems, Control and Communication (IJSCC). She serves as the Publicity Chair of the 2011 International Symposium on Neural Networks (ISNN 2011), Publications Chair of the International Conference on Information Science and Technology (ICIST 2011), Publications Chair of the Fourth International Workshop on Advanced Computational Intelligence (IWACI2011), Publications Chair of the 2011 IEEE International Conference on Networking, Sensing and Control (ICNSC 2011), Publications Chair of the Third International Workshop on Advanced Computational Intelligence (IWACI 2010), Publications Chair of the International Conference on Intelligent Control and Information Processing (ICICIP 2010), Program Co-Chair of the Sixth International Symposium on Neural Networks (ISNN 2009), Publications Co-Chair for 2008 IEEE World Congress on Computational Intelligence (WCCI 2008), and Technical Program Committee Member for many IEEE international conferences.



Poster Presentation-From left to right: Gizaw Mulugeta, Senior Mechanical Engineering student, Dimitri Ditombi- Bamba, Senior Mechanical Engineering student.

Dr. Esther Ososanya and two LSAMP students attended the American Society of Engineering Education (ASEE) Global Conference at Cape Town, South Africa, in October. The students gave a Poster presentation on “The Design of an Experimental Anaerobic Digester for Organic Waste Processing”. The UDC-LSAMP Project Coordinator, together with three LSAMP Engineering students attended the 6th

ASEE (American Society for Engineering Education) Global Colloquium on Engineering Education Conference. The coordinator and the students were coauthors of three technical Poster Presentations in Istanbul, Turkey.

The Graduate School at Howard University is partnering with four universities in Europe: Universiteit Utrecht (the Netherlands), Central European University, Budapest (Hungary), University of Edinburgh (Scotland) and Universidade de Coimbra (Portugal). Selected students perform research abroad for one semester. In some cases, the stay can be extended to one academic year. Upon their return, the students present selective seminars to the Graduate School Students at Howard University, through the Howard Hughes Research Program, participated in parasitological research in Ethiopia every summer. More than five students from the WBHR-LSAMP program have performed research under this program.

Through an interdisciplinary major in Marine and Environmental Science, offered through the Hampton University Center for Marine and Coastal Environmental Studies, with support from the American Society of Limnology and Oceanography (ASLO) and the National Science Foundation, students present scientific papers in Nice France annually.

Norfolk State University through the Intelligence Community Center of Academic Excellence Grant provided support to students to travel to Morocco, Tunisia and China from fall, 2006- present. Students participating in this program were from Norfolk State University,



Howard University, the University of the District of Columbia and Old Dominion University. STEM students are encouraged through this program to layer their STEM degrees with a language. In most majors, the humanities requirement can be substituted by a language. This feature allows for a larger number of STEM students to participate in this type of program.

Dr. William Chang, Director of the NSF in China in 2008 meets with Dr. Arlene Maclin and STEM students from Norfolk State University while they study for eight weeks in China during the summer.



Poster Session on the Hill

On Thursday, July 22, 2010, there was a principal investigator/ project directors' meeting of the Louis Stokes Alliance for Minority Participation (LSAMP) at the Washington Hilton Hotel in Washington, DC in the morning with a poster session of exemplary research in the afternoon at the Rayburn Building on Capitol Hill. More than 26 of the 42 LSAMP Alliances from across the nation participated.

Dr. Clarence Lee, Executive Director of the Washington Baltimore Hampton Roads (WBHR)-LSAMP program, welcomed more than 75 faculty and students to the meeting. Dr. Arlene Maclin served as the moderator for the morning session. Dr. Maclin briefly summarized activities that had occurred since the Joint Annual Meeting in June 2010 and then an open discussion of conference goals and objectives of the meeting were led by Dr. Cheryl Dozier.

For the afternoon session, more than 50 students prepared posters to showcase their research to members of congress and their staff. This session was held at the Rayburn Building. Congresswoman Eddie Bernice Johnson from the Thirtieth District of Texas served as the hostess for this portion of the meeting.

During the poster session from 4:00-6:00 pm in the Rayburn Building, a number of visitors came to talk with the students presenting their posters. Notable among them included Congressman Ruben Hinojosa from the Fifteenth District of Texas and chair of the Higher Education Committee in the House, staff member Eric Hammond, legislative assistant to Congresswoman Johnson and grandson of former Congressman Louis Stokes, for whom the LSAMP program is named. Other staffers from Congressman Sheila Jackson Lee's staff in Texas as well as congressional staffers from the states of Massachusetts, Missouri, New York, and others states visited the students during the poster sessions. The students were also able to share and discuss their research results with other students from other LSAMP Alliances during the poster session.



PH.D. Graduates from the WBHR-LSAMP Program



Thomas Hardy, Ph.D

Assistant Professor
Virginia Union University

In a world faced with critically low levels of fresh drinking water, escalating global temperatures, and diminishing energy reserves there is no time more challenging and relevant to engage in the study of ecology. Spectacular advances in technology and knowledge bases have significantly transformed this area.

The sequencing of full genomes of many plants and animals has led to a clearer distinction between taxonomic relationships. The various ways alterations in climate and biodiversity can affect populations and communities of organisms is now routinely studied within laboratories. My research focuses specifically on the impact declining biodiversity has on ecosystem services provided by food web interactions and organism mediated nutrient cycling. I am interested in investigating how various assemblages of organisms assist in structuring the communities that foster these services and in manipulating small replicable systems from which to draw conclusions about large-scale ecosystems. The model organisms I use for these manipulations are called phytotelmata. Highly prevalent throughout Neotropical regions, these plants impound copious amounts of fluid that support “miniature ecosystems” that are readily available for study. They are also great tools for the study of metapopulations. Within my research construct, you will have the opportunity to study both plants and animals and learn of the enormous biodiversity offered by the tropics. Considerable attention is devoted to the impact these alterations will have on the future of human populations in terms of health and disease, including how to mobilize conservation efforts.

I currently reside in Richmond, Virginia and I am an Assistant Professor at Virginia Union University. I earned my Ph.D. in biology with a focus in tropical ecology from Howard University in 2009. I conducted my Ph.D. research at the Las Cruces Biological Station in Coto Brus, Costa Rica.



Kendall Williams, Ph.D.

Assistant Professor
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Education

- Ph.D. Mathematics, Howard University, Washington, DC, 2011
- M.S. Mathematics, Howard University, Washington, DC, 2007
- B.S. Mathematics, Howard University, Washington, DC, 2005

Research Areas/Interests

- Topological Algebra (Ultrafilters)
- Combinatorics - Ramsey Theoretic/Partition Regularity Results

Publications

- Characterization of elements of polynomials in Beta S

Courses Taught

- Fall 2011: MA205, Integral Calculus and Introduction to Differential Equations



Adana Llanos, PhD

Molecular Epidemiologist

Dr. Llanos is a Postdoctoral Fellow in the Department of Oncology and a member of the Minority Health & Health Disparities Research Program at the Georgetown Lombardi Comprehensive Cancer Center. She received her PhD in Genetics from Howard University in 2009.

She is an associate member of the American Association for Cancer Research (AACR) and a member of the AACR Molecular Epidemiology Group.

Her research interests include molecular epidemiology of breast cancer (specifically gene-environment interactions and biomarker development to improve early detection) and cancer health disparities (specifically related to the obesity and lifestyle and the way these factors contribute to disparities in cancer prognosis).

Melissa Carol Fletcher ✎ Ph.D. 2009 ✎ Chemistry

B.S., Howard University, 2004

"The Adsorption of 4'-Trimethylsilylethylsulfanyl-4,4'-di(phenyleneethynylene) benzene Thiol and AllylquinoliniumTricyanoquinodimethanides of Silver Surfaces for Use in Molecular Electronics"

Thomas Jor-El Hardy ✎ Ph.D. 2009 ✎ Biology

B.S., Howard University, 2004

"Contrasting Profiles in *Heliconia* and Bromeliad Phytotelmic Communities in Costa Rica: The Role of Physical, Chemical, and Trophic Cues in Controlling Community Structure"

Assistant Professor of Biology, Virginia Union

Adana Andrea Marcia Llanos ✎ Ph.D. 2009 ✎ Genetics and Human Genetics

B.S., Howard University, 2004

"Associations Among Tissue IGFs, Adipokines, Morphology, and Breast Cancer Susceptibilities"

Post Doctoral Fellow at Georgetown University

April Eleya McLauchlin ✎ Ph.D. 2010 ✎ Genetics and Human Genetics

B.S., University of North Carolina at Chapel Hill, 2003

"Genetic Variation and FOXP3 Expression in Prostate Tumor"

Medical Student at University of North Carolina at Chapel Hill

Jocelyn Celesté Myers ✎ Ph.D. 2010 ✎ Biology

B.S., Johnson C. Smith University, 2003

"The Differential Gene Regulation of Proteolytic Enzymes in the *Biomphalaria glabrata-Schistosoma mansoni* Relationship"

Kendall Ryan Ashford Williams ✎ Ph.D. 2011 ✎ Mathematics

B.S. Howard University, 2005

"Separating Milliken-Taylor Systems and Variations thereof in the Dyadics and the Stone-Čech Compactification of \mathbb{N} "

Assistant Professor of Mathematics, United States Military Academy

Justin Wilson ✎ Ph.D. 2011 ✎ Physiology

B.S. Howard University, 2005

"The Role of Interleukin-6, Nicotinamide Adenine Dinucleotide Phosphate Oxidase Subunit-2, and Peroxisome Proliferator Activated Receptor-alpha During Angiotensin II Induced Hypertension"

Shantelle T. Lucas ✎ Ph.D. 2011 ✎ Microbiology

B.S. North Carolina State University, 2004

"I κ B kinase Beta (IKK-Beta): Nuclear Factor kappa B (NF κ B) Signaling in the Obesity-Inflammation Relationship in Africans Americans"

Post-Doctoral Fellow, NIH

Vic Lee Boddie II ✎ Ph.D. 2012 ✎ Biology

B.S. Hampton University, 2005

"Occurrence of Antibiotic Resistance in *Pseudomonas* Species From Organic and Non-Organic Salads and the Development of a PCR Primer for the Identification of *Pseudomonas fluorescens*"

Sandra Elaine Dillahunt ✎ Ph.D. 2012 ✎ Microbiology

B.A., American University, 2000

"The Sphingosine Kinase-Sphingosine-1-Phosphate Axis in Mast Cell Regulation"

John H. Johnson ✎ Ph.D. 2012 ✎ Mathematics

B.S. Texas A&M University, 2005

"Some Differences Between an Ideal in the Stone-Čech Compactification of Commutative and Noncommutative Semigroups"

Rhonda Patrice McCoy ✎ Ph.D. 2012 ✎ Chemistry

B.S. North Carolina A&T State University, 2004

"Probing the Adsorption Behavior of 4,5-Diazafuoren-9-one and Its Schiff Base Derivatives When Self-Assembled on Ag and Au Nanoparticles Using Raman Spectroscopy, Density Functional and Potential Energy Distribution Calculations"

Sulman Javed Rahmat ✎ Ph.D. 2012 ✎ Anatomy

B.S. Howard University, 2005

"Hindbrain Neurovascular Anatomy in Goldfish and Zebrafish, With a Comparative Analysis of Brainstem Vasculature in Vertebrates"

To: The National Science Foundation
From: Shantelle Lucas
Re: Bridge to Doctorate Fellow Update
Date: April 3, 2011



On May 9th, 2005 I received my acceptance letter from the Department of Microbiology at Howard University in Washington, D.C. I was both elated and anxious because my dream of obtaining a Doctorate of Philosophy was tangible, but at the same time I did not know what to expect and had other personal issues such as financial obligations that needed to be met. About two weeks after I received my acceptance letter, I received a call from the Microbiology secretary at the time Ms. Maureen Crawford. She informed me about the Bridge to Doctorate fellowship program and that I should apply. Frantically, I completed the application as I wanted to ensure that the necessary documents were in on time. I submitted the application to Dr. Clarence M. Lee office. Then, within two weeks I received noticed that I was awarded the fellowship for two years. Hearing this news lifted the financial burdens that I did not want to experience as a graduate student. The funds that I received from the National Science Foundation allowed me to fully support myself during classes in my degree program.

After the two years, I began conducting my thesis work at the National Institutes of Health in Bethesda, MD as a pre-doctoral Intramural Research Training Award (IRTA) fellow. I was an IRTA fellow at the Center for Research on Genomics and Global Health (CRGGH) under the National Human Genome Research Institute (NHGRI). As a graduate student, I was granted the opportunity to create, design, and facilitate my thesis project. My research dissertation mentors, Drs. Charles Rotimi and Adebawale Adeyemo, were very supportive and played an integral part in my thesis project which assessed a proposed genetic mechanism that link obesity and inflammation. In my project, I proposed that single nucleotide polymorphisms (SNPs) in two immune genes inhibitor of kappa light polypeptide gene enhancer in B cells, kinase beta (*IKKB*), which codes for I κ B kinase beta (IKK- β), and v-rel reticuloendotheliosis viral oncogene homolog A (avian) (*RELA*), which codes for nuclear factor kappa b (NF κ B), play a role in inflammatory dysregulation in the context of obesity. I chose to assess these two immune genes because it is known that the IKK- β /NF κ B pathway is the primary source of inflammatory biomarkers in obesity. Using SNP genotyping, ELISA assays, gene expression (using real-time polymerase chain reaction) and genetic association studies, results from my study showed that both *IKKB* and *RELA* SNPs are associated obesity status and circulating pro and anti inflammatory cytokine levels. Hence, these SNPs contribute to the inflammatory dysregulation in obesity. I defended this work at Howard University on April 5th, 2011.

Again, I would like to thank NSF for funding me for my first and second year in graduate school. This helped me tremendously as I was able to focus solely on my studies and allowed me to search for tentative labs to conduct my PhD thesis work. I wanted to let the organization know that programs such as the Bridge to Doctorate need to be kept as students such as myself need your support. If we did not have your support, many of us would not be able to attend school, as we solely have to provide for our families and ourselves; therefore, some students would have to balance a full time job and graduate school, although doable, would be difficult. Currently, I am searching and interviewing for postdoctoral positions.

Most Sincerely,
Shantelle Lucas

Thank You letter to NSF:

Preparing The Future of STEM



President David Wilson Welcomes High Achieving 8th Grade Grads to Morgan State University MSU Class of 2015

Morgan President David Wilson surprised about 100 graduating eighth graders at the Bluford Drew Jemison Science Technology Engineering Mathematics Academy on Saturday, June 4, when he presented each with a letter of admission to attend the university. Dr. Wilson announced their acceptance into the MSU Class of 2015 during his commencement address to the graduates and their families. "If these young men will maintain a 3.0 grade point average and at least a 900 SAT score, I will reserve their space at Morgan in 2015," says Wilson.

The Bluford Drew Jemison STEM Academy, when it opened its first campus in Baltimore in 2007 was the first all-male public middle school in the State of Maryland. The school prepares young men to become high achieving scholars by focusing on a curriculum rich in science, technology, engineering and mathematics. "It was a unique way of stimulating our men to reach for higher education at an early age," said Dr. Anne Emery, Chair of the Bluford Drew Jemison STEM Academy Board of Directors. "We are very excited about the relationship between Morgan State and the Academy."

Jordan Brown, a new alum of the S.T.E.M. Academy, says he is excited to count Morgan as a future college option. "It gives us a good chance to strive for our future by challenging us to keep our grades up," said 13-year-old Brown, who plans to become an attorney. "It blew us away. It was like a gift, so unexpected," said Brown's mother Deborah Brown. Ms. Brown, who is a graduate of historically black Saint Paul's College in Lawrenceville, Va., hopes that Jordan finds value in the black college experience.

“During the past ten years, Howard University has worked closely with its Alliance partner institutions, whose leadership remains strongly supportive of the WHBR-LSAMP Project. The Project’s Board of Governor’s is committed to the WHBR-LSAMP mission to address the underrepresentation of minorities in the critical areas of science, technology, engineering and mathematics (STEM). Howard University will facilitate appropriate planning and accountability to ensure the Project’s success.” - **Dr. Sidney Ribeau, HU**

“We appreciate and applaud the efforts of the National Science Foundation in addressing the need to increase the participation of minorities in science, technology, mathematics, and engineering. We are pleased to be a part of this great Alliance and we join our partners on their commitment to increasing opportunities for minorities in science, technology, engineering, and mathematics.” - **Dr. Sandra DeLoatch, NSU**

“We can point to several noteworthy outcomes in STEM during the past LSAMP period:

- A 24% increase in undergraduate enrollment between 2003/04 and 2007/08 (912 to 1127)
- 17% growth in bachelor’s degrees awarded between 2003/04 and 2007/08 (110 to 129)
- The initiation of three new STEM master’s degree programs (in cancer biology, computer science, and applied statistics; with M.S. proposal in electrical engineering ready for Board approval); and
- Substantial increases in the number of STEM faculty engage in research, obtaining STEM grants, and mentoring student research. “ - **Dr. Allen L. Sessoms, UDC**

“The WBHR-LSAMP Program has enabled our students to be meaningfully involved in research experiences, to publish their work and foster nurturing and mentoring relationships with faculty members. This program will work well with our other student support programs from, NASA and DOD. We are also pleased to announce that we have PhD programs in Engineering, Bio-environmental Sciences and Industrial and Mathematical Sciences. This will bring further opportunities for our students and the Alliance.” -**Dr. Joan Robinson, MSU**

“Bowie State University has been working to address the problem of underrepresentation of minorities in the critical areas of science and technology for many years. Our Model Institutions for Excellence program, sponsored by NASA and NSF, speaks to Bowie’s Commitment for increasing the number of minority students in science and technology.” - **Mickey L. Burnim, BSU**

“Our campus has been working diligently to address the problem of the underrepresentation of minorities in the critical areas of science, technology, engineering, and mathematics (STEM) for many years. We are committed to the mission and goals of the project and we will do all we can to increase the number of students receiving degrees in the STEM areas.” -**W. Weldon Hill, VSU**

“The involvement of Hampton University students and faculty with WBHR-LSAMP’s network of universities has been a productive experience. The research opportunities offered by the WBHR-LSAMP Project are very attractive to our undergraduate students and will continue to play a key role in assisting us in attracting talented students in the STEM fields.” - **William Harvey, HAU**

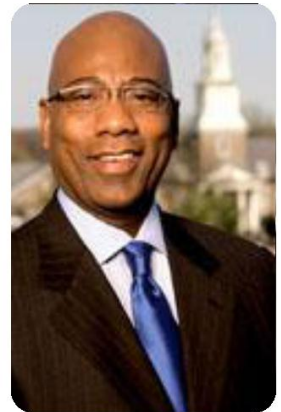
WBHR-LSAMP Leadership



Dr. William Harvey
Hampton University



Dr. Tony Atwater
Norfolk State University



Dr. David Wilson
Morgan State University



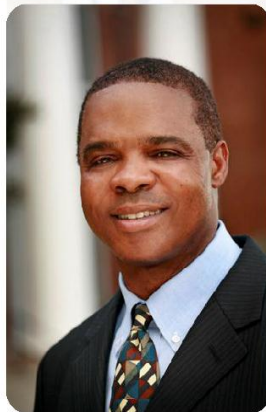
Dr. Mickey Burnim
Bowie State University



Dr. Sidney Ribeau
Howard University



Dr. Allen L. Sessom
University of the District of Columbia



Dr. Keith Miller
Virginia State University

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