

*Washington/ Baltimore/
Hampton Roads*

Louis Stokes

*Alliance for Minority
Participation*

*BRIDGE TO THE
Doctorate Program*

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

Howard University

2008



BRIDGE TO THE DOCTORATE (BD) PROGRAM

Meeting the Need:

Under the leadership of the Washington-Baltimore Hampton Roads- Louis Stokes Alliance for the Minority Participation (WBHR-LSAMP), Howard University has enroll forty-nine (49) Bridge to the Doctorate(BD) students in the first four 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.

Over the past decade, Howard University has continued to be the national leader in the production of African Americans in all fields as documented in our WBHR-LSAMP annual report of October 31, 2006. Howard University continues to lead in the production of African Americans with degrees in STEM fields. The NSF publication "Women, Minorities, and Persons with Disabilities in Science and Engineering 2004 is the source for the statistics that Howard University is the leading producer of African American baccalaureate recipients who go on to receive Ph.D. degrees; <http://www.nsf.gov/statistics/wmpd/>

Twenty-five years after significant national, state, and university efforts to increase participation of minorities in graduate school and the professoriate, the numbers of students receiving Ph.D.s in the STEM areas have grown, only very slowly. Minorities still constitute a small number of Ph.D recipients(a detailed presentation of the survey results can be found in the annual Doctorate Recipients from United States Universities: Summary Report at <http://www.norc.uchicago.edu/issues/docdata.htm>; National Science Board, Science and Engineering Indicators, 2008).

According to a recent publication of Building Engineering & Science Talent (BEST), The talent Imperative: Diversifying America's Science and Engineering Workforce, the national interest lies in producing a pool of homegrown technical talent that can reliably meet the long-term needs of the U.S. innovation enterprise by cultivating a much larger share of talent from underrepresented groups(women, African Americans, Hispanics, Native Americans and persons with disabilities). The National Science Board publication, Science and Engineering Indicators 2008 reflected that the increase in the percentage of foreign born S & E doctorate level workers rose from 24% in 1990 to 38% in 2000. In addition, a growing proportion of S&E doctoral faculty members are also foreign born. The proportional percentage for the latter group increased from 21% in 1992 to 28% in 2003. The "Bridge to Doctorate" Program was initiated to address this crisis. In addition, we already know that because of the "graying" of the scientific and engineering workforces in universities and national laboratories, many new jobs will become available over the next decade. The critical issues now facing the United States, are where the new S&E work force will come from and whether they will be U.S. citizens. We believe that the Bridge to the Doctorate Program is one response to such issues.

Clarence M. Lee, Ph.D
Executive Director,
WBHR-LSAMP Program

Highlights of the WBHR-LSAMP Bridge to the Doctorate Program

In May 2004, the National Science Foundation (NSF) notified the WBHR-LSAMP that the Alliance would be funded for Phase III of the AMP program. As a part of Phase III, the Alliance was allowed to submit a supplement/proposal for the Bridge to the Doctorate (BD) Program.

Howard University, a Carnegie Doctoral Research Extensive Institution, is the lead school for the BD Program. Howard, in addition to being a Research Extensive Institution, offers Doctoral degrees in 16 STEM fields.

Subject to fund availability, the BD program supports twelve (12) students a year. The students receive full tuition support and a stipend of \$30,000 per year for the first two years of graduate study from the NSF. Students are not permitted to hold a separate job during this time. The job of the BD student is to obtain a Ph.D. in a STEM discipline.

Since 2004, Howard University has hosted 49 Bridge to the Doctorate 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 to include pharmacology, biology, microbiology, physiology/biophysics, anatomy, and genetics.

The following qualifications requirements apply to the Howard University Bridge to the Doctorate Program:

- The student **must be a U.S. citizen or a permanent resident** of the U.S. or its possessions. Applicant must provide proof of citizenship at the time of application. ***Student is required to submit a copy of birth certificate or US passport or permanent resident card.***
- The student must have participated directly or indirectly in the LSAMP program at the undergraduate level and **must provide certification of this participation.**
- Must be a **first-time** graduate student. We are prohibited from accepting students who have already begun matriculating in graduate studies.
- The student must meet requirements for and be accepted to or have applied to the Howard University Graduate School in a STEM discipline. **Application to the Howard graduate school is separate from application to the BD program.**
- The student must be **recommended by two faculty members** from his/her home school or from the Howard University graduate program.

Any BS graduate with a degree in one of the STEM disciplines who meets the above criteria is eligible to apply. However, students who meet the above criteria and have majored in and intend to do graduate study in chemistry, physics, engineering, mathematics, and atmospheric sciences are particularly sought.

Specific Activities of the BD Program

All the current and future BD students participate in the following activities:

- **One-On-One Individualized Mentoring of Fellows and Seminars:** Monthly-prearranged individual mentoring sessions are conducted with Doctoral Scholars as part of our continuous mentoring commitment.
- **Peer Mentoring:** Doctoral Scholars serve as peer mentors to new graduate students facilitating their successful adjustment to life in graduate school. This experience is beneficial to the Doctoral Scholars as well, particularly in that it allows them to feel a sense of accomplishment by giving back to others and aiding others in overcoming some of the obstacles they may face as new graduate student.
- **Faculty Mentoring:** In addition to the faculty's continuous academic advising and mentoring roles, the Office of Retention and Mentoring continues to solicit the support and cooperation of the academic departments in enhancing the mentoring experiences of graduate students. Faculty members serve as presenters at the various workshops and seminars organized by the Office of Retention and Mentoring from ensuring success in graduate school to securing external funding and developing a teaching portfolio.
- **The Responsible Conduct of Research (RCR) Workshop** is held to provide students and faculty with pertinent federal and University guidelines and regulations pertaining to the responsible conduct of research as well as a method of utilizing moral reasoning skills in responding to ethical dilemma in research.
- **Expository Writing Program.** All entering graduate students are required to take the English Proficiency Examination in Expository Writing, including students who have GRE Analytical Writing scores.

Degree Requirements

The degree of Doctor of Philosophy is awarded upon the student's demonstration of mastery of certain fields of knowledge, ability to conduct independent research and ability to organize research into an acceptable dissertation that represents a significant contribution to the student's field of study. The specific requirements in addition to those listed in the GSAS document, "Rules and Regulations for the Pursuit of Academic Degrees," are:

1. a minimum of 72 semester hours of graduate work, inclusive of the dissertation, 36 of which must be earned within the department
2. an approved program of study including all such courses and requirements specified by the Graduate Faculty
3. successful completion of Qualifying Examinations specified by the Guidance Committee
4. an approved dissertation proposal
5. a minimum of four semesters of research, and
6. successful defense of the dissertation.

BRIDGE TO THE DOCTORATE FELLOWS Howard University

COHORT 2



Aleya Ashburn. BS. Electrical Engineering, Howard University 2004. Graduate program: Ph.D program in Mathematics.



Micah Ballton, BS, Physics, Spellman College, 2004. Graduate Program: Ph.D in Physics. MS obtained from Howard. Plans to continue in the field of biophysics in Atlanta.



Peter Chery, BS, Mathematics and Computer Science, Bowie State University, 2004. Graduate program, MS in Computer Science obtained from Howard. Continuing at George Mason University.



Sandra Dillahunt, BS, Molecular Biology, Winston Salem State University, 2003. Graduate Program: Ph.D in Microbiology.



Toye Doggett Reddick, BS, Biology, Hampton University, 2001. Graduate Program: Ph.D in Physiology.



Mellissa Fletcher, BS, Chemistry, Howard University, 2004. Graduate Program: Ph.D in Chemistry.



Kourtney Fulton, BS, Mathematics, South Carolina State University, 2004. Graduate Program: Ph.D in Mathematics. MS obtained from Howard.



Sandra Gunn, BS, Biology, Bowie State University, 2001. Graduate Program: Ph.D in Pharmacology.



Maya Holcombe, BS, Biology, Voorhees College, 2004. Graduate Program ; Ph.D in Plant Biology.



Durrell Jones, BS, Mathematics, University of Maryland - Eastern Shore, 2004. Graduate Program: Ph.D in Mathematics.



Adana Llanos, BS, Biology, Howard University, 2004. Graduate Program: Ph.D in Genetics.



April McLaughlin, BS, Biology, University of North Carolina – Chapel Hill, 2003. Graduate Program: Ph.D in Genetics.



Jocelyn Myers, BS, Biology, Johnson C. Smith University, 2003. Graduate Program: Ph.D in Molecular Parasitology.

COHORT 3



Kevin Belgrave, BS, Biology, Howard University, 2005. Graduate Program: Ph.D in Genetics. Completed MS and entered the MD/Ph.D Program.



Vic Boddie, BS, Biology, Hampton University, 2005. Graduate Program: Ph.D in Microbiology.



Dia Evans, BS, Biology, Virginia State University, 2005. Graduate Program: Ph.D in Microbiology.



Isabelle Garcia-Ramos, BS, Biology, University of Puerto Rico at Humacao, 2005. Graduate Program: Ph.D in Anatomy.



Thomas Hardy, BS, Biology, Howard University, 2004. Graduate Program: Ph.D in Environmental Ecology.



Lakisha Hawkins, BS, Biology, North Carolina A&T University, 2004. Graduate Program: Ph.D in Genetics. MS obtained form Howard.



Christine Jackson, BS, Biology, Howard University, 2004. Graduate Program: Ph.D in Developmental Biology.



Shantelle Lucas, BS, Biology, North Carolina State University, 2004. Graduate Program: Ph.D in Microbiology.



Lynda Perry, BS, Morgan State University, 2002. Graduate Program: Ph.D in Developmental Biology.



Sulman Rahmat, BS, Biology, Howard University, 2004. Graduate Program: Ph.D in Anatomy.



Alicia Richardson, BS, Mathematics, Morgan State University, 2004. Graduate Program: Ph.D in Mathematics.



Kendall Williams, BS, Mathematics, Howard University, 2005. Graduate Program: Ph.D in Mathematics.

----- **COHORT 4** -----



Ashley Comer, BS, Biology, University of Maryland – Eastern Shore, 2006. Graduate Program: MS in Nutritional Sciences with planned application to Ph.D program upon completion.



Duane Doles, BS, Physics, University of the District of Columbia, 2006. Graduate Program: Ph.D in Physics.



Tia Feaster, BS, University of Maryland – Baltimore Campus, 2003. Graduate program: Ph.D in Anatomy.



Belinda Hauser, BS, Biology, University of Maryland – Eastern Shore, 2006. Graduate Program: Ph.D in Genetics.



John Johnson, BS, Mathematics, Texas A&M University, 2005. Graduate Program: Ph.D in Mathematics.



Chiamaka Kalu, BS, Biology, Claflin University, 2004. Graduate Program: Ph.D in Environmental Ecology.



Peter McCalla, BS, Physics, Morgan State University, 2006. Graduate Program: Ph.D in Mathematics.



Headley Murray, BS, Computer Science, Howard University, 2006. Graduate Program: MS in computer Science and planned continuation of Ph.D at University of Texas.



Moses Ukaoma, BS, Chemical Engineering, Howard University, 2006. Graduate Program: MS in Chemical Engineering with planned continuation at another institution upon attainment of MS.



Eniolorunda Rotimi, BS, Chemical Engineering, Howard University, 2005. Graduate Program: MS in Chemical Engineering with planned continuation at another institution upon attainment of MS.



Joseph Williams, Jr, BS, Chemistry, Miles College, 2006. Graduate Program: Ph.D in Chemistry.



Justin Wilson, BS, Biology, Howard University, 2005. Graduate Program: Ph.D in Physiology.

----- COHORT 5 -----



Christopher Agard, BS, Biology, Howard University, 2007. Graduate Program: Ph.D in Environmental Ecology.



Louis Antoine, BS, Mechanical Engineering Technology, Northeastern University, 2007. Graduate Program: MS in Mechanical Engineering with planned application to the Ph. D. program upon completion of MS.



Monique Calhoun, BS, Physics, Hampton University, 2007. Graduate Program: Ph.D in Physics.



Daniel Casimir, BS, Physics, Morgan State University, 2002. Graduate Program: Ph.D in Physics.



Kasey Davis, BS, Biology, Morgan State University, 2006. Graduate Program: Ph.D in Anatomy.



Denetra Evans Breuer, BS Biochemistry, North Carolina State University, 2004. Graduate Program: Ph.D in Microbiology.



Ezra Hackett, BS, Biomedical Engineering, New Jersey Institute of Technology, 2004. Graduate Program: Ph.D in Microbiology.



Kimberly Mason, BS, Biology, St. Augustines College, 2004. Graduate Program: Ph.D in Microbiology.



Rhonda McCoy, BS, Chemistry, North Carolina A&T University, 2004. Graduate Program: Ph.D in Chemistry.



Frajovon Talley, BS, Chemistry, Howard University, 2007. Graduate Program: Ph.D in Chemistry.



Jorge Velez-Juarbe, BS, Biology, University of Puerto Rico – Mayaguez, 2007. Graduate Program: Ph.D in Anatomy.



Danyelle Winchester, BS, Biology, University of Maryland – Eastern shore, 2006. Graduate Program: Ph.D in Genetics.

Class 1, Cohort 2



Sandra Dillahunt, Microbiology. BS, 2003, Winston Salem College. Sandra 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. The advantages of short hairpin RNA over siRNA are that it allows for the activation of endogenous dicer to generate siRNA, as well as allows for stable expression in cells. The cells will be used to characterize functional attributes of each of the kinases such as degranulation, cytokine production, and calcium responses. In addition, a genetic analysis of the cells' genome are done to find any variations that may be caused by the loss of kinase gene expression. Taken together, the data from the project will characterize each kinase based upon species and explain differences in reported studies. Sandra has presented this research at Howard University and on the campus of NIH. She has completed all of her courses for the Ph.D degree and will be admitted to candidacy in May 2009 The Ph.D degree should be awarded in May 2011.



Mellissa Fletcher, Chemistry. BS, 2004, Howard University. Mellissa 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. The results indicate that MALDI is capable of detecting two other DNA benzopyrene adducts, which are trace products formed during the synthesis of BPDE-d guanosine. This MALDI-TOFMS method offers the potential for the detection of DNA adducts in human tissue using very limited sample purification and preparation. In addition to a major publication, Mellissa has presented her research locally and at national meetings. She has completed all of her courses for the Ph.D degree and has been admitted to candidacy. She should be awarded the Ph.D degree by May, 2009.



Kourtney Fulton, Mathematics. BS, 2004, South Carolina State University. When Kourtney was interviewed for the Bridge to the Doctorate Program, she immediately indicated that she plans to teach mathematics at the college level and to become President of a University. All of her plans are in order. In addition to tutoring students in mathematics, over the past three years she has attended and presented in the Joint Mathematics Conference. Her research is dealing with the topic of Algebra in the Stone-Cech Compactification. Her advisor, Dr. Neil Hindman (an expert in this aspect of mathematics), has provided the mathematical world with findings in both Ramsey Theory and the algebraic structure of $\beta\mathbb{N}$. These areas involve the study of the algebraic properties of compact right topological semigroups in general and the Stone-Cech compactification of a discrete semigroup. There are numerous applications to combinatorics, primarily to the branch of combinatorics known as Ramsey Theory. Connections with topological dynamics and ergodic theory are also presented in the study of Algebra in the Stone-Cech compactification. Kourtney research deals with some application of the Stone-Cech compactification. She has completed all of her course work and will be admitted to candidacy by May, 2009. She hopes to complete the Ph.D degree by May, 2012.



Adana Llanos, Genetics. BS, 2004, Howard University. Adana is studying the associations among plasma adiponectin, leptin, folate, and IGF-1 and age and BMI in women undergoing reduction mammoplasty. This study investigates 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. In several of her presentations, Adana reported that Insulin-like growth factors (IGFs) play a role in the normal development of the human breast and potentially increase breast cancer risk. Adipokines, specifically adiponectin and leptin may also increase breast cancer risk. Plasma as well as age and BMI data were available for 143 study participants. Plasma adiponectin and leptin concentrations were quantified using commercially available enzyme-linked immunosorbent assays. Plasma folate and IGF-1 concentrations were quantified using the Immulite 1000 system. Assay results were highly reproducible and intra-assay variation was minimal. This is a major study and Adana has made major strides in solving a major scientific problem. Adana has attended and presented in the following conferences: JAM Meeting- Washington, DC – National Science Foundation; AACR Annual Meeting- April 12-16, 2008, San Diego, CA - American Association for Cancer Research; ASPO Annual Meeting- Bethesda, MD - American Society for Preventive Oncology ;AACR-TREC-NCI Conference on Energy Balance and Cancer: Mediators and Mechanisms- Lansdowne, VA- American Association for Cancer Research ;Cancer Health Disparities Summit Bethesda, MD -National Cancer Institute AACR Annual Meeting- Washington, DC- American Association for Cancer Research; Frontiers in Cancer Prevention, Baltimore, MD -American Association for Cancer Research; ASBH Annual Meeting- October 20-23, 2005, Washington, DC-American Society for Bioethics & Humanities. Adana has passed both written and oral comprehensive exams in her department. She is currently in candidacy and will be defending her dissertation by Summer 2009.



April McLaughlin, Genetics. BS, 2003, University of NC, Chapel Hill. April has taken 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 times 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. The role that the immune system plays in prostate cancer progression is a topic of debate. In this research, increased numbers of nTreg cells have already been linked to prostate cancer progression with FOXP3 as the master regulator of their suppressive activity. However, information about the role of FOXP3 and its target CTLA-4 in prostate tumor progression is still needed. Specifically, there have been no studies analyzing the effect of tumor cells expressing FoxP3 on proliferation. Also, while CTLA-4 haplotypes have been associated with tumor progression in other cancers, there have been no studies of the variants' effect on naïve T cell proliferation. Few variants have been described in FOXP3, and of these, no studies have analyzed their association with prostate cancer, and possible contribution to prostate tumor escape and progression. April has been admitted to candidacy and should be awarded the Ph.D in May, 2009.



Jocelyn Myers, Biology. BS, 2003, Johnson C. Smith University. Jocelyn Myers received a NIH- Bridging the Career Gap for Underrepresented Minority Scientist. This funding will allow her to complete her Ph.D degree. Jocelyn is working on cysteine protease activity in *Schistosoma mansoni*. Due to her excellent research, she was invited to become a member of Sigma Xi. She has presented her research at several meetings (American Society for Tropical Medicine and Hygiene Annual Meeting, November 2007 Philadelphia PA; NSF- JAM June 2008 Washington DC) Jocelyn has passed her Ph.D Qualifying examination and should be admitted to candidacy in the fall semester, 2008. She should receive her Ph.D in May, 2010.

Jocelyn research was recently published in the Journal of Parasitology (Differences in cysteine protease activity in *Schistosoma mansoni*-resistant and -susceptible *Biomphalaria glabrata* and characterization of the hepatopancreas cathepsin B Full-length cDNA. Journal for Parasitology. 94(3): 659-668).



Maya Holcombe. BS, 2004, Voorhees College. Plant Molecular Biology has become very important in recent years. Maya 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 true-to-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 AlphaImager 2000 system (Alpha Innotech, San Leandro, CA). AFLP separation and analysis kit (Invitrogen, Carlsbad, CA), supplemented with IRD-800 fluorescent dye (Li-Cor, Lincoln, NE) were used to amplify DNA markers from all accessions. The AFLP profiles are being analyzed on a 6%-poly-acrylamide sequencing gel using Li-Cor DNA Analyzer (Li-Cor, Lincoln, NE). AFLP markers (DNA fingerprints) are to be scored and analyzed using Saga™ Generation 2 Version 3.1 (Li-Cor, Lincoln, NE) and TreeCon Dendrogram Version 1.38 Software (Scanalytics Inc., Fairfax, VA). Currently, AFLP primers pairs that produce ample polymorphic bands for true-to-type identification of cherry accessions are being selected. Maya has completed all of her academic requirements for the M.S. degree. She will be completing her Ph.D degree at Vanderbilt University.

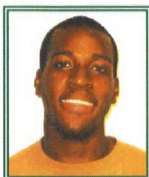
Class 2, Cohort 3



Vic Boddie, Microbiology. BS from Hampton University. Vic Boddie is currently working on his Ph.D degree in Microbiology. He is studying bacterial isolates in ready to eat salads. He is very interested in the development and evaluation of a 16S ribosomal DNA array-based approach for describing complex microbial communities in ready-to-eat vegetable salads packed in a modified atmosphere. FDA is very interested in his project. Owing to this research, Vic was recently awarded the GK-12 fellowship. This will allow him funding to complete his Ph.D degree. Vic has attended and presented at two workshops (NSF Conference in Washington, D.C. for the Bridge to the Doctorate Program and the 2008 GK-12 Conference in Washington, D.C.). Vic should be admitted to candidacy in 2009 and expects to complete his Ph.D degree in 2011.



Isabelle Garcia-Ramos, Anatomy. BS, 2005, University of Puerto Rico at Hamacao. The limbic system-associated membrane protein (LAMP) is a 64-68 x 10(3) M(r) glycoprotein that is expressed by subsets of neurons that are functionally interconnected. LAMP exhibits characteristics that are indicative of a developmentally significant protein, such as an early and restricted pattern of expression and the ability to mediate specific fiber-target interactions. A potential, selective adhesive mechanism by which LAMP may regulate the formation of specific circuits is currently under investigation by the Neurophysiology Department at Howard University under the direction of Dr. Thomas Heinbockel. Isabel worked with him on one of these projects. In addition to this research, Isabel has worked with Dr. John Young on muscle regeneration in diabetic mice. One of the exciting areas that Dr. Young is investigating involves coordinated patterns of gene expression for substrate and energy metabolism in skeletal muscle of diabetic mice. Isabel will work on one of these topics for her Ph.D degree. In addition to her research activity, Isabel has been involved in several community projects: Anatomy Department Open House for High School students; Independent Histology Tutor; Anatomy Department Open House for undergraduate students. Isabel will complete her qualifying exam for Ph.D in October, 2008. She hopes to complete the Ph.D degree by May, 2012.



Thomas Hardy, Biology. BS, 2004, Howard University. Community ecology 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 is to focus on small systems with discrete boundaries. Thomas is 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. Previous work that Thomas has been involved in has shown differences in community structure not only between plants, but within plants as well. While some initial surveys of diversity have been published little work has been done on the community dynamics within these pools. Thomas wants to investigate what kinds of competition are going on within the pools, and how the communities are assembled. He is also interested in applying the theory of island biogeography to the interactions between pools. Since they are isolated, these pools are essentially reverse archipelagos, islands of water surrounded by a sea of land, and thus this theory could easily be applied to this system. Thomas has been admitted to candidacy for the Ph.D degree. The degree should be awarded by May, 2009.



Shantelle Lucas, Microbiology. BS, 2004 North Carolina State University. Shantelle has been isolating primary cultures of fetal derived mast cells from mouse neonates. She has been using various transfection methods (transient, stable, and amaxa) in order to transfect sphingosine kinase 2 protein into the mast cells. Using PCR site directed mutagenesis; sphingosine kinase two constructs were successfully mutated. Having both non-mutated and mutated constructs has allowed Shantelle to reconstitute cells from mice that were deficient in the protein, and compare the results to wild type cells (cells with the functional protein), and cells that were deficient in the protein, but were not reconstituted with the protein. The reason for the later was to assess this particular protein role in regulating mast cell effector functions during allergic and asthmatic episodes. Studies using confocal microscopy, mast cell degranulation assays, FceRI/ckit receptor expression, cytokine release assays are being used to give Shantelle a better understanding of the function of the protein in mast cells system. Shantelle plans to be admitted to candidacy in 2009 and should complete the Ph.D degree in May, 2010.



Sulman Rahmat, Anatomy. BS, 2004, Howard University. Sulman is working with Dr. Edwin H. Gilland on the evolutionary origins for social vocalization in a vertebrate hindbrain–spinal compartment. The macroevolutionary events leading to neural innovations for social communication, such as vocalization, are essentially unexplored. Many fish vocalize during female courtship and territorial defense, as do amphibians, birds, and mammals. Taxonomic analysis demonstrates a highly conserved pattern between fish and all major lineages of vocal tetrapods. Dr. Gilland proposes that the vocal basis for acoustic communication among vertebrates evolved from an ancestrally shared developmental compartment already present in the early fishes. Sulman is attempting to understand the mechanism of the action related to the vocalization in the hindbrain. Sulman has completed all of his coursework. He is making progress in writing his proposal and should be admitted to candidacy by May, 2009. He is expected to complete his Ph.D by May, 2012.



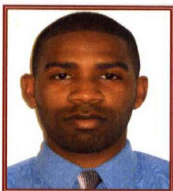
Alicia Richardson, Mathematics. BS, 2004, Morgan State University. Alicia attended the 2006 Joint Mathematics Meetings in San Antonio, Texas, January 12-15, the 2007 Joint Mathematics Meetings in New Orleans, Louisiana, January 5-8, and the 2008 Joint Mathematics Meetings in San Diego, California, January 6-9. She has passed one qualifying exam in Partial Differential Equations. She plans to take a second qualifying exam in Number Theory in January 2009, and the third qualifying exam in either Statistics or Cryptology the following May or August. She plans to apply for candidacy in the Fall of 2009.



Kendall Williams, Mathematics. BS, 2005, Howard University. Since entering the Ph.D program, Kendall Williams has attended a numerous seminars and conferences(August 2005 Joint Statistical Meetings (JSM) in Minneapolis, MN;

January 2006 Joint Math Meetings in San Antonio, TX; 2006 Bridge to Doctorate Meetings in Washington, DC; Summer 2006 GEM Conference in Chicago, IL; January 2007 Joint Math Meetings in New Orleans, LA; 2007 Bridge to Doctorate Meetings in Washington, DC; January 2008 Joint Math Meetings in San Diego, CA; Fall 2007 NAM conference in Atlanta, GA; July 2008 Beta N Conference in Oxford, OH). Kendall has conducted the following studies: Using Support Vector Machines to classify microarray data; while serving as an intern at the NSF in the Department of Graduate Education (DGE), conducted a study on the progress of Mathematics majors being funded by the DGE; separating Miliken-Taylor Systems at Howard University. Kendall has completed the required coursework as well as the two written qualifying exams. He is currently working on his research and plans to enter candidacy by May, 2009. After entering candidacy, Kendall can take his third and final oral qualifying exam before defending his dissertation in May, 2010.

Class 3, Cohort 4



Duane Doles, Physics. BS, 2006, University of the District of Columbia. Duane has worked with Supernova Acceleration Probe(SNAP) at Fermilab. Duane participated in analyses extracting statistics of the large scale structure in the universe.

The Theory Group has been instrumental in pushing forward with a new optical survey in the Southern Hemisphere. The proposed survey is designed to measure the properties of galaxy clusters. This information can then be used to learn about dark energy. SNAP exposed Duane to satellite mission, which is advocated by both NASA and the Department of Energy. The satellite will enable scientists to detect thousands of distant supernovae and measure the shapes of very distant galaxies. Any of these projects can be used for a Ph.D project in Physics. Duane has reached the stage of writing and defining a research proposal for his Ph.D. He hopes to complete this exercise by May, 2009. He should be admitted to candidacy by December, 2009 and the Ph.D degree should be completed by May, 2012.



Belinda Hauser, Genetics. BS, 2006, U of MD, Eastern Shore. Since entering Howard University, Belinda has been working on the detection of a gene copy of epidermal growth in established head and neck squamous cell carcinomas cell lines. This research has been presented at the American Association for Cancer Research(AACR) in San Diego, California. In June 2008, Belinda attended a workshop in clinical oncology in Aspen Colorado. Belinda is planning to defend her M.S. degree in the Fall of 2008. She will continue some aspect of this study for her Ph.D degree.

She is expecting to complete the Ph.D degree by May, 2012. She was recently inducted into the Society of Sigma Xi.



John Johnson, Mathematics. BS, 2005, Texas A&M University. John is making progress in the Ph.D program in Mathematics. He is working with Dr. Neil Hindman, a mathematical genius, who have trained more Ph.Ds in mathematics than anyone in the country. His research area and that of John deal with the topological semigroups. They are interested in studying the algebraic structure of the Stone-Cech compactification of a discrete semigroup and its applications to Ramsey Theory. The

latter field is a branch of combinatorics which deals with structures that are guaranteed to be present in one cell of a finite partition of specified sets, or often in any suitably large subset thereof. In this connection, John has attended several national conferences. During the Fall semester, 2007, John organized G-delta, a math seminar where graduate students can present their research and improve their communication skills. Except for his foreign language requirements, John has completed all of his courses for the Ph.D. He should be admitted to candidacy by May, 2009. He hopes to complete the Ph.D degree by May, 2012.



Chiamaka Kalu, Biology. BS, 2004, Claflin University. Lichens accelerate the degradation of minerals by physical and chemical methods and are ideal microcosms in which to study microbially mediated mineral weathering. Chiamaka current research program includes: the study of lichen weathering of rock, lichens as biomonitors, the long-term carbon cycle and coevolution of climate and life (the Earth's "geophysiology"), biogenesis and early biospheric evolution, the uses and misuses of thermodynamic concepts in environmental science and the material prerequisites for a sustainable world. Determination of the elemental runoff fluxes from lichen-covered bedrock could potentially provide quantitative estimates of biotic enhancement of weathering over the abiotic weathering regime. Chiamaka spent her summer collecting rocks in Rock Creek Park. She is in the process of studying and characterizing the various lichens on these rock samples. Chiamaka has completed most of her course work. She is in the process of preparing a paper for publication. She should complete this research project in the next two semesters. Due to her research performance, Dr. David Schwartzman, an expert in the study of lichens, recommended her for membership into Sigma Xi.



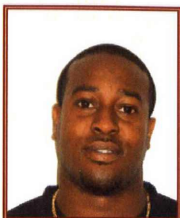
Headley Murray, Computer Science. BS 2006, Howard University. Headley Murray and two of his classmates (Edwin Andrews, Kharim Ames) from Howard University were selected as the winning team of the Sixth Annual Microsoft Windows Media Player Skins Challenge, a unique college-level competition to create original user interfaces for the Windows Media Player. The program, a collaborative effort between Howard University, the National Society of Black Engineers (NSBE) and Microsoft Corporation, was created to expose African American college students to opportunities in computer science and engineering, provide students with hands-on experience in technology, and to increase the number of African Americans who enter the IT and other related fields. Due this achievement, Headley was invited to become a member of Sigma Xi. Headley completed his M.S. degree in Computer Science during the summer, 2008. He is planning to enter the Ph.D program in Computer Science at Texas A & M University in January, 2009.



Peter McCalla, Mathematics. BS 2006, Morgan State University. Peter is working toward the Ph.D in Mathematics. His research topic is entitled *Elliptic Curves over Finite Fields*. He has completed all of his courses for the Ph.D degree. He plans to be admitted to candidacy in 2009 and should complete his Ph.D degree by May, 2011. In addition to his activity at Howard University, Peter served as a tutor in the Morgan University, Catch-Up Math Program. He was recently inducted into the Society of Sigma Xi.



Moses Ukaoma, Chemical Engineering. BS 2006, Howard University. Prior to formally joining the Howard University family, Moses' achievements were acknowledged by his desire to do research. In fact, he won several awards based upon his LSAMP undergraduate research. He was inducted into Sigma Xi as an undergraduate student. Based upon these achievements, Moses decided to pursue graduate studies after his undergraduate training. His M.S. research is on characterization and modeling of the electrophoretic deposition (EPD) of silver nanoparticles. Moses has completed all of his coursework and has been admitted to candidacy for the M.S. degree. He is scheduled to receive the degree in December 2008. He plans to continue the Ph.D degree at Johns Hopkins University. Moses' community and civic involvement are noteworthy. These involvements include mentoring junior students, serving as editor-in-chief for a local community newspaper, and volunteering in hospitals. His most recent involvement was canvassing for the campaign several local politicians.



Joseph Williams, Chemistry; BS 2006, Miles College. Joseph is in the process of learning the mechanism of drug synthesis. The drug manufacturing industry has produced a variety of medicinal and other health-related products undreamed of by even the most imaginative apothecaries of the past. These drugs have saved the lives of millions of people from various diseases, and they permit many ill people to lead reasonably normal lives. Joseph is working on several products that might have a significant impact on the virus producing AIDS. The two products will hopefully lead to the production of common intermediate core for the drugs Ritonavir and Lopinavir. During his research at Howard University, Joseph is using modern drug techniques involving screening small molecules for their ability to bind to a preselected protein target. Target-oriented syntheses of these small molecules, individually or as collections (focused libraries) are planned effectively with retrosynthetic analysis. Joseph is working with Dr. Joseph Fortunak, an expert in the production of various drugs used in the several disease conditions. Joseph is in the process of completing his coursework. He should be admitted to candidacy by May, 2009 and hopes to complete his Ph.D degree by May, 2012.



Justin Wilson, Physiology. BS 2005, Howard University.

For his Ph.D, Justin is working on the "Non-conjugate eye movement during binocular and monocular fixation in *Macaca mulatta*". Due to this research, Justin has made presentations numerous presentations: Gordon Oculomotor Research Conference: Bates College in Maine July 2006; Academy of Neurology: Boston, Massachusetts May 2007; Society for Neuroscience: San Diego, Ca November 2007; 7th Annual Specialized Neuroscience Research Program Conference: New York, NY August 2008. He is scheduled to give a presentation on his research at the Society of Neuroscience in Washington, D.C. in November, 2008. Justin is planning to be admitted to candidacy in 2009 and should complete his Ph.D degree by May, 2011. Owing to his excellent research, Justin was recently initiated in the Society of Sigma Xi

Class 4, Cohort 5



Christopher Agard, Biology. BS, 2007, Howard University. Every summer, Chris Agard works with Dr. George Middendorf in a study of a proscribed (deliberately set) forest fire in Southeastern Arizona at the Chiricahua National Monument. The effects are examined in populations of Yarrow's spiny lizard, *Sceloporus jarrovi*, a species of lizard that frequents rocky canyons and sprints up the vertical canyon walls to chase rivals and mates, as well as to escape predators. Behavioral observations made during this study led to a project examining the effects of tail-loss with the hypothesis that tail-autotomy may decrease a lizard's ability to run vertically; turn corners, and right itself. These were examined for *Sceloporus jarrovi*, as well as three other sympatrically-occurring species that utilize different microhabitats (*S. clarkii*, *S. virgatus*, and *Urosaurus ornatus*). Christopher is currently examining the video recordings in order to produce more accurate times for the individual trials and has begun data analysis. Christopher has attended and presented at numerous conferences and seminars (Howard University 2008 Graduate Research Symposium and Honors Day- Washington, DC; Middle-Atlantic Ecological Society of America (MAESA) Regional Conference - Wilkes-Barre, PA; Southwestern Research Station - Portal, AZ). The presentations at these meeting focused on describing methodology and findings in an investigation into the effects of employing an evolutionarily important escape behavior on the success of secondary escape attempts in saxicolous spiny lizards (*Sceloporus jarrovi*) as well as on *Sceoporus. jarrovi*'s subsequent maneuverability. By the end of the fall semester, Christopher will have completed all the courses required by the Biology Department. He hopes to complete the process of candidacy by May, 2009. His Ph.D degree should be completed by 2012.



Monique Calhoun, Physics. BS, 2007, Hampton University. Attended NSBP (National Society of Black Physicist) at the Omni Hotel in Washington DC Feb 20-24, 2008. Monique completed LIDAR (Light Detection and Ranging) research and training at HURL (Howard University Raman Lidar) Laboratory during summer 2008. She also tutored undergraduates in Physics. Monique should take her qualifying examinations for the Ph.D in spring 2010.



Daniel Casimir, Physics. BS, 2002, Morgan State University. Daniel is working on his Ph.D degree in the area of Theoretical Physics. He is looking at a perverse sheaf approach toward a cohomology theory for string theory. In doing so, he and his major advisor(Dr. Abdul Rahman) present the construction and properties of a self-dual perverse sheaf S_0 whose cohomology fulfills some of the requirements of String theory as outlined by T. Hubsch in hep-th/9612075. Daniel has completed most of his course work. He plans to be admitted to candidacy by December, 2009 and hopes to complete the Ph.D degree by May, 2013.



Kasey Davis, Anatomy. BS, 2006, Morgan State University. Kasey has an exciting project for her Ph.D work. Axon terminals synapsing on neurons in the nucleus tractus solitarius(NTS) originates from the central nucleus of amygdala (CeA). CeA have been shown to contain Gamma aminobutyric acid(GABA) immunoreactivity. But it is unknown, whether the CeA-RVLM(Rostral ventrolateral medulla) terminal contains immunoreactivity. Also it is known that cells in the CeA are GABAergic, but it is not known which particular cells in the CeA are GABAergic. For this study, the pathway between the CeA-RVLM will be examined to see if GABA is produced. Also the cells in the CeA that produce GABA will be examined. Her hypothesis is that the central amygdala projects directly to RVLM neurons that produce GABA and these maybe involved in decreasing blood pressure. Kasey hopes to be admitted to candidacy during the next academic year. The Ph.D degree should be completed by May, 2013.



Kimberly Mason, Microbiology. BS, 2004, St Augustine College. Kimberly is currently working on her Ph.D on the characterization of a nucleotide excision repair NER Defect (NER) defect in a Xeroderma Pigmentosum Cell. She has presented this research at several conferences(National Institutes of Health, Spring Research 2008 Conference, Bethesda, MD, May,2008;National Institutes of Health Summer 2008 Conference, Bethesda, MD, August 2008). She is making excellent progress toward her Ph.D degree and should be admitted to candidacy by 2009. The Ph.D degree should be awarded by May, 2011.

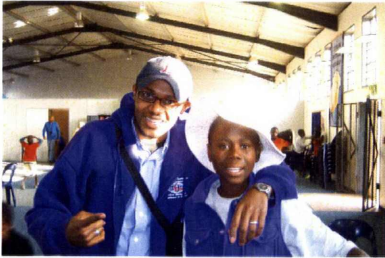


Rhonda McCoy, Chemistry. BS, 2004, NC A&T University. Rhonda is working toward the Ph.D in Chemistry. Currently, she is working on the determination of cocaine, benzoylecgonine, cocaethylene and norcocaine in human hair using solid-phase extraction and liquid chromatography with tandem mass spectrometric detection. Her project for the Ph.D involves Density Functional Theory on DYP. In addition to her many seminars at Howard University, she has also presented at the Nanoscience Conference at Howard University. In addition to her education, Rhonda directed two all girl science camps in Southern California through Education Unlimited, Sally Ride Science. Rhonda plans to complete her requirements for candidacy by 2009 and her Ph.D degree by May, 2012.



Jorge Velez-Juarbe, Anatomy. BS 2007, University of Puerto Rico, Mayaguez. With a BS in Geology, Jorge is currently a graduate student of anatomy with an emphasis in Vertebrate Paleontology. He has been involved in several projects as an undergraduate, and participated in an internship at the National Museum of Natural History in Washington, D.C. In Puerto Rico, Jorge has been involved in the organization of the paleontological collection at the Department of Geology, University of Puerto Rico, Mayaguez Campus. He is making excellent progress in the Ph.D program. In addition to publishing two papers and making presentations at national and international meetings, Jorge was recently inducted into the Society of Sigma Xi.

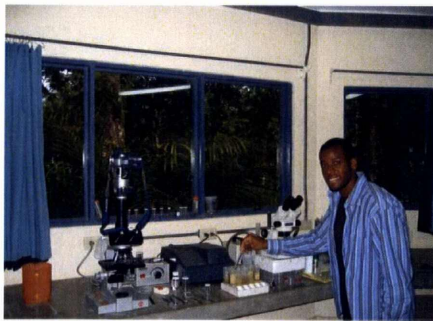
Bridge to the Doctorate Special Activities, Programs or International Events



international setting and was informed of the different relief efforts and public health initiatives that were being made.

Mr. Justin Wilson, cohort 4, majoring in physiology visited Johannesburg and Capetown, South Africa with 20 other young leaders from Howard University and the University of Maryland. As a mission volunteer, he worked in the village of Diesploot. Justin reports that he experienced a major life-changing event when the smiling faces of 200 young children who were innocent, beautiful, and tenacious greeted him through song and dance. Justin experienced first hand knowledge of the impact of HIV/AIDS on an

Mr. Thomas Hardy, cohort 3, majoring in environmental ecology spent two months of the summer of 2007 in the southern Talamancan mountain range of Costa Rica continuing his comparison of the invertebrate communities of tropical phytotelmata. The research uncovered interesting new details led him to believe community structure is controlled by more than predation. Chemical and physical cues presented by the plants act to selectively attract insects. These data also suggest that tropical phytotelmata are benefitting from their unique associations of inquilines. He intends to further support these findings in summer 2008 research by performing colorimetric assays of radioactively labeled isotopes of nitrogen and phosphorous within the plant tissue.



Kourtney Fulton, cohort 2, 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," Fulton adds. "It makes me feel that I can do this; to know somebody like me is making it, I know I can too," Street adds.

Howard University Bridge Students Conducting Research

Mr. Jorge Velez-Juarbe, a first year student in the Department of Anatomy. Jorge spent the summer, 2008 performing research in Puerto Rico. Some of Jorge's projects involve fossils of elasmobranchs (sharks & rays), crustaceans (crabs), echinoderms (sea urchins & starfishes), crocodylians, sirenians and terrestrial vertebrates, with an emphasis on Puerto Rico and the Caribbean. He is currently collaborating with experts from other institutions in the description and publication of several papers on different subjects about fossils of Puerto Rico. Two of his publications are listed below:

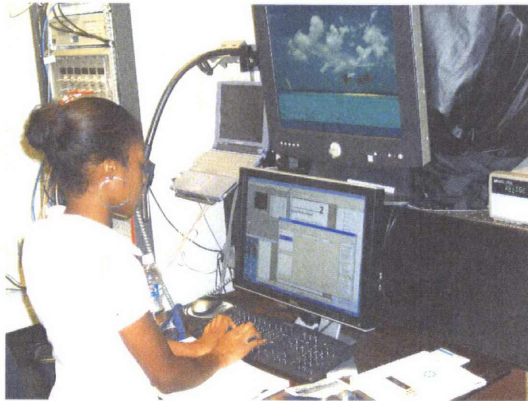
Schweitzer, C. E., J. Velez-Juarbe, M. Martinez, A. Collmar-Hull, R. M. Feldmann and H. Santos. 2008. New Cretaceous and Cenozoic decapoda (Crustacea: Thalassinidea, Brachyura) from Puerto Rico, United States Territory. *Bulletin of the Mizunami Fossil Museum* 34:1-15.

Velez-Juarbe, J. and H. Santos. 2008. Fossil Echinodermata from Puerto Rico; pp. 369-395 in W. I. Ausich and G. D. Webster (eds.), *Echinoderm Paleobiology*. Indiana University Press, Bloomington, Indiana.



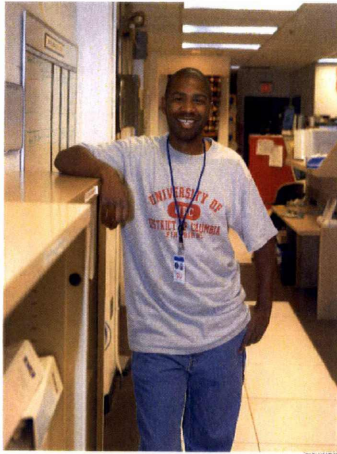
At left, Alvin Bonilla (on the rocks) (University of Kansas) and Velez-Juarbe work on a sirenian mandible that they found in north central Puerto Rico.

Above right, in the Department of Anatomy at Howard University, the sirenian mandible collected in Puerto Rico, which Jorge is holding in his hand, is now ready for measurements and description.



Monique Calhoun, a cohort 5 Physics major at LIDAR (Light Detection and Ranging) research and training at HURL (Howard University Raman Lidar) Laboratory during summer 2008

Duane Doles- Research Associate at Fermilab(FNAL)



Duane Doles



Astrophysics Group at Fermilab (FNAL)

The 15 students in Fermilab's Summer Internships in Science and Technology (SIST) program concluded their work at the lab with presentations of their projects. The SIST students, who are all majoring in physics, electrical-mechanical engineering or computer science, spent the summer making important contributions to the lab in fields ranging from beam line dynamics to wireless networking.

Interns in the SIST program spent their summer making important contributions to the laboratory. This year's SIST students are (left to right): Ayomide Odunsi, Ayodele Onebokun, Linda M'mayi, McDavis Fasugba, Trivia Frazier, Marla Singleton, Judith Odili, Dennis Lamenti, Eleonora Figueroa, Sirius Ben-Judah, Gabriel Vega, Michael Carter, Duane Doles, Michelle Alvarado, and Donovan Tooke



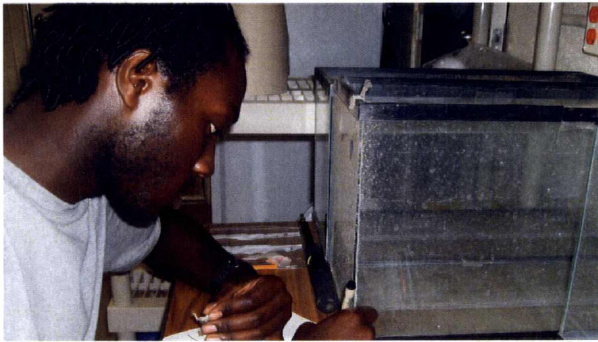
Christopher Agard (in white shirt) teaching Ecology to Students

Christopher Agard and Dr. George Middendorf



examining lizard for parasites

Christopher Agard working with his samples



Maya Holcombe working on *Prunus*, the Japanese Flowering Cherries





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