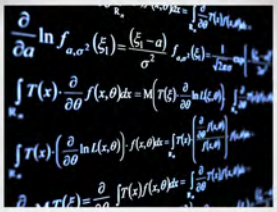
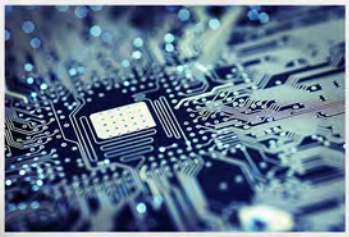
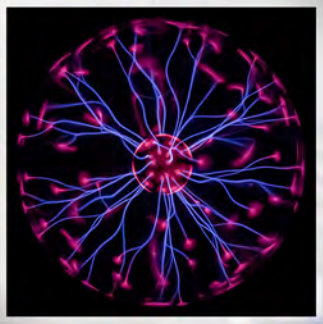
THE STEM CLARION

UNIVERSITY of ARKANSAS AT PINE BLUFF







Helping to Build a Stronger Community and Nation through Science, Technology, Engineering and Mathematics Careers

STEM

FALL 2015

UAPB UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

THE STEM CLARION

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PURPOSE OF UAPB STEM SCHOLARS ACADEMY

The UAPB STEM Academy is a well-integrated set of enrichment programs designed to help meet local, state and national human resource needs in STEM areas. As an HBCU with a land grant mission, the University of Arkansas at Pine Bluff (UAPB) has a legacy of service to underserved, rural and minority populations. The STEM Academy reflects this mission and has a particular emphasis on helping to increase the pool of well-prepared underrepresented minorities in STEM majors and careers.

Currently, there are three enrichment initiatives, including the NSF-funded HBCU-UP Comprehensive Implementation grant which is foundational to the STEM Academy; the NSF-funded Arkansas Louis Stokes Alliance for Minority Participation grant which is reflective of best practices learned in the HBCU-UP STEM Academy; and the U.S. Department of Education funded M.Ed. Degree in Science and Mathematics Education Program. All are designed to help meet research, teaching, and industry needs in science areas, with a particular emphasis on diversity in these critical area. The Arkansas Science and Technology Authority is also a major partner in these initiatives.

Some key components of the STEM Academy initiatives include: Guest Lecture Series, advisory board, Pre-First Year Summer Institutes/Academy, hands-on research/mentoring experiences, internships, study groups, curricula and infrastructure upgrades. Currently, the STEM Academy has 229 undergraduates and six graduate students.

Disciplines include: chemistry, mathematics, physics, computer science, biology, plant and animal sciences, and industrial technology.

STEM Scholars Academy

UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

Office of the Chancellor

Greetings:

It is with great pleasure and "Golden Lion" pride that I share with you the excitement and success of our Science, Technology, Engineering, and Mathematics (STEM) Academy at the University of Arkansas at Pine Bluff (UAPB). As one of our premier programs at UAPB, the STEM Academy is designed to increase the number and diversity of well-prepared graduates who will be among the nation's leading professionals in the U.S. and global scientific workforce. While STEM is the driving force that will move this country forward, it is vital to the future of our community that we educate and prepare our students to advance in global leadership and contribute to the economic prosperity of this community, state, and nation through STEM careers. The STEM Academy continues to provide students the opportunity to thrive in a professional STEM community as well as provide a unique experience and connection with scholastic resources that help create relevance to classroom learning and fosters personal development. Our STEM majors reflect the diversity present at UAPB, breaking stereotypes about women and minorities in STEM fields.

Last year was a very productive year that included a new partnership with Bell Community Services, a new grant with the National Science Foundation HBCU-UP Program, a 100% first to second year retention rate, and much more. Needless to say, we are well on track to achieving the gold standard in overall academics. Our faculty members are devoted to high quality instruction and student preparation. They are enthusiastic about collectively engaging in research and instruction that addresses energy, environment, education, health care, and other grand challenges with our students.

As we look forward to growth and improvement in our STEM disciplines, the experience of the student is paramount. Increasing the breadth and depth of our programs, upgrading lab equipment, and improving learning spaces are all important steps in providing a holistic learning environment that stimulates excitement for discovery.

It is with sincere gratitude that we recognize our administrators, stakeholders, and supporters who have displayed extraordinary zeal and commitment to the success of our STEM Academy. I am confident that through our collaborative endeavors, we can help build a stronger state and nation through Science, Technology, Engineering, and Mathematics as we continue to shape the minds that one day will reshape the world!

Sincerely,

Laurence B. Alexander, J.D., Ph.D.
Chancellor

1200 North University Drive, Mail Slot 4982 · Pine Bluff, AR 71601
Office: (870) 575-8470 · Fax: (870) 575-4645 · Email: chancellor@uapb.edu
www.uapb.edu/chancellor

Letter from the Principal Investigator

2015 was a very productive year for the University of Arkansas at Pine Bluff (UAPB) STEM Academy. This was evidenced in the 100% first to second year retention rate; a new funding partner, Bell Community Services; a new 5-year grant for the National Science Foundation HBCU-UP Program; and occupancy of the administrative suite in the new STEM Academy and Conference Center.

Fall 2015 was a landmark! A member of our first HBCU STEM cohort received the PH.D. in Chemistry from Oklahoma University and returned to his alma mater (UAPB) as an assistant professor in the Chemistry Department. Business and industries continued to hire our graduates, especially the Computer Science and the Industrial Technology Management and Applied Engineering majors. Among the employers are Proctor and Gamble, John Deere, General Electric and Georgica Pacific.

The NSF-funded HBCU-UP and ARK-LSAMP students reported very enriching summer internship outcomes at sites including Kennedy Space Center (NASA) Merritt Island, FL, Climb Up Summer Research, Buffalo, NY, National Institute of Health, Bethesda, MD; Stant,, Pine Bluff, AR; Toyota Corporation, Erlanger, KY; University of Texas Health Science Center, San Antonio, TX.

UAPB STEM Scholars represented the university and the STEM Academy at campus, state and national conferences. Aliyah Glover presented a poster in the Social and Behavioral Sciences Mathematics Education Category at the UAPB Legislative Day and has been invited to give the same presentation to the Arkansas 15% Set-A-Side Advisory Board on Tobacco Prevention and Cessation. She also presented a poster at the 2015 ERN Conference. Andra Bates gave an oral presentation at the 2015 ERN Conference on "Does HIV-I Manipulate Cellular Stress Responses" and won a first place award. He is now enrolled at the University of Texas Health Science Center-San Antonio in the Virology and Immunology Program.

Bell Community Services: (Pictured L-R: *Mr. Ellis Bell, Ms. Catherine Coleman, Mr. Maleek Ware, Ms. Azia Pugh-Thomas, Ms. Ashlyn Carlton, Chancellor Laurence B. Alexander* and *Dr. Mary E. Benjamin*

A delegation of STEM Scholars attended and presented posters at the Arkansas INBRE State Conference in Fayetteville, Arkansas in November 2015. The P.I. is a member of the Arkansas INBRE Management Committee.

The STEM Academy continues to partner with other university/college STEM Enrichment Initiatives. Dr. Anissa Buckner, Chair for Biology is Co-PI with Dr. Malatha Srivatson who is P.I. for the NSF funded "Bridging the Divide" grant at Arkansas State University (A-State). Another STEM faculty member, Dr. Joy Jackson received funding, through the Carl D. Perkins Technical Education and the Arkansas Department of Career Education to offer a STEM Conference for girls. Fifteen young women (10th -12th grade, college freshman and sophomores) attended and received workshops and experiential learning on forensic science, chemistry, coding/computer science and electronic technology.

Through the NSF-ASSET II grant to the Arkansas Science and Technology Authority, the University of Arkansas at Pine Bluff STEM Academy is the recipient of a green mobile, valued at $139,000. It was transferred from the University of Arkansas ASSET II Project. The Green Mobile was a unit in the 2015 UAPB Homecoming Parade. A group of UAPB STEM Scholars walked in front of the unit in the parade which attracted more than 5,000 families, students and individuals. The green mobile was also displayed for Rotary in Little Rock. On campus visits to the Green Mobile included the Pine Bluff Boys and Girls Club and participants in the UAPB STEM Summer Academy.

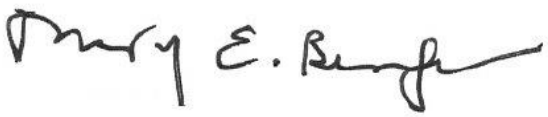
The best practices of the STEM Academy are being integrated in campus wide initiatives such the UAPB Quality Initiative (QI) for its continuing accreditation by the Higher Learning Commission. The quality initiative is focused on retention and graduation of black males. The STEM Academy is included as a campus organization that can help to ensure the success of the initiative based on some of the lessons learned by the STEM Academy.

A signal honor, in term of public notice and dissemination, was the November 2015 issue of SEA LIFE magazine which featured the P.I. As the cover story entitled “STEM Vision that became reality.” This news magazine is circulated to 10,000 in the Arkansas Delta.

We extend special thanks to all who helped to ensure a productive year for the STEM Academy. Included, not exhaustively, are the National Science Foundation, Arkansas Science and Technology Authority, Bell Community Services, the U.S. Department of Education, Chancellor Lawrence B. Alexander and the cabinet, the External and Internal Advisory Boards, Dr. Akbar Saba, (the evaluator), the STEM Scholars, the Office of Grant Accounts, the Co-PIs (Dr. Charles Colen and Dr. Anissa Buckner) and a very dedicated staff.

Our hope is that the UAPB STEM Academy will continue on this productive path in 2016 and beyond.

Sincerely,



UAPB UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

Mary E. Benjamin, P.I., UAPB STEM Academy

Vice Chancellor for Research, Innovation and Economic Development

UAPB STEM ACADEMY LEADERSHIP

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Dr. Jessie Walker, Ph.D
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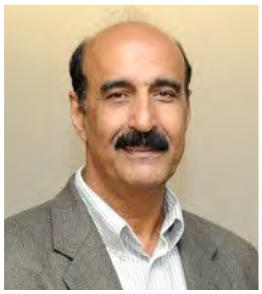

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Mrs. Genevia Kelsey Thomas, MBA
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Jasmine Johnson
Major: Chemistry
President

Aliyah Glover
Major: Biology
Vice President

Saige Davis
Major: Biology
Treasurer

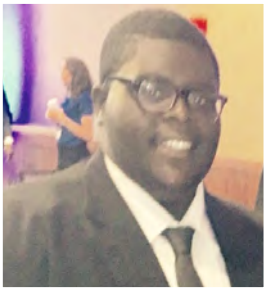
Joshua Byrd
Major: Biology
Sargent At Arms

Zakiya Baruti
Major: Chemistry
Communication Liaison

Xavier Westmoreland
Major: Biology
Historian

Mamie Jennings
Major: Biology
Project Manager

Rae'Vyn Britt
Major: Biology
Ms. STEM



Zachary Fluker
Major: Mathematics
Mr. STEM

STEM ENROLLMENT DATA

University of Arkansas at Pine Bluff - STEM Enrollment Fall 2005 - Fall 2015

Undergraduate Programs Source: UAPB Office of Institution and Research

	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	FALL 2014	FALL 2015	One (1) Year % Change Fall 2014 to Fall 2015	Ten (10) Year % Change Fall 2005 to Fall 2015
Agriculture Science	126	131	137	133	160	168	100	159	162	144	134	-6.9%	6.3%
Chemistry	27	28	35	44	54	49	52	54	49	52	47	-9.6%	74.1%
Computer Science	137	110	112	121	127	136	114	100	104	106	110	3.8%	-19.7%
Industrial Technology	136	119	124	157	176	162	158	158	137	157	163	3.8%	19.9%
Biology	193	190	187	207	230	269	304	296	311	327	364	11.3%	88.6%
Mathematics	44	40	45	49	39	52	34	29	27	35	33	-5.7%	-25.0%
Physics	4	3	7	5	5	6	7	4	7	6	11	83.3%	175.0%
TOTAL - STEM	**667**	**621**	**647**	**716**	**791**	**842**	**769**	**800**	**797**	**827**	**862**	**4.2%**	**29.2%**
TOTAL - UAPB (UG)	3,132	3,051	3,099	3,388	3,651	3,283	3,063	2,724	2,521	2,401	2,545	6.0%	-18.7%
%STEM/ TOTAL UAPB	**21.3%**	**20.4%**	**20.9%**	**21.1%**	**21.7%**	**25.6%**	**25.1%**	**29.4%**	**31.6%**	**34.4%**	**33.9%**	**-1.7%**	**59.0%**

Source: UAPB Office of Institution and Research

STEM RETENTION DATA

University of Arkansas at Pine Bluff - STEM Enrollment Fall 2005 - Fall 2015

Profile of First-Time Entering STEM Students with Comparative

Fall Semester	% Arkansas Residents	% Arkansas Residents from Jefferson County	Average High School GPA	Average ACT Composite Score	All First-Time Full-Time Freshmen	STEM First-Time Full-Time Freshmen	STEM Academy Students
2005-2006	60.5%	56.4%	2.86	17	56.3%	66.2%	**65.2%**
2006-2007	56.0%	50.5%	2.82	17	54.3%	60.4%	**81.8%**
2007-2008	60.0%	54.8%	2.89	17	57.0%	64.2%	**82.1%**
2008-2009	55.7%	46.7%	2.86	17	60.4%	69.1%	**80.4%**
2009-2010	54.4%	52.4%	2.77	17	63.9%	69.8%	**80.0%**
2010-2011	54.5%	50.8%	2.77	17	57.0%	65.0%	**81.3%**
2011-2012	52.3%	45.2%	3.37	21	54.6%	63.9%	**87.0%**
2012-2013	59.6%	41.6%	3.43	22	56.2%	58.0%	**93.1%**
2013-2014	70.0%	47.6%	3.42	22	62.1%	70.3%	**93.3%**
2014-2015	**59.3%**	**43.8%**	**3.44**	**22**	**70.5%**	**79.5%**	**100.0%**

Fall	Gender	Fall Cohort Enrollment	# Retained After 1st Year	First-Year Retention Rate
2008	Male	21	18	**85.7%**
2008	Female	14	10	**71.4%**
2008	**Total**	**35**	**28**	**80.0%**
2009	Male	6	5	**83.3%**
2009	Female	10	8	**80.0%**
2009	**Total**	**16**	**13**	**81.3%**
2010	Male	13	10	**76.9%**
2010	Female	18	13	**72.2%**
2010	**Total**	**31**	**23**	**74.2%**
2011	Male	9	8	**88.9%**
2011	Female	12	12	**100.0%**
2011	**Total**	**21**	**20**	**95.2%**

Fall	Gender	Fall Cohort Enrollment	# Retained After 1st Year	First-Year Retention Rate
2012	Male	11	11	**100.0%**
2012	Female	18	16	**88.9%**
2012	**Total**	**29**	**27**	**93.1%**
2013	Male	11	10	**90.9%**
2013	Female	19	18	**94.7%**
2013	**Total**	**30**	**28**	**93.3%**
2014	Male	8	8	**100.0%**
2014	Female	19	19	**100.0%**
2014	**Total**	**27**	**27**	**100.0%**
Total	Male	79	70	**88.6%**
Total	Female	110	96	**87.3%**
	Total	**189**	**166**	**87.8%**

Source: UAPB Office of Institution and Research

UAPB SCIENCE FAIR EXPOSITION

The University of Arkansas at Pine Bluff (UAPB) held its 10th Annual Science Fair Exposition (Expo) on February 2015. The Expo was held in the arena of the Kenneth L. Johnson, Sr. HPER Complex. The date of the Expo was set to enhance the readiness and competitiveness of students for the regional fairs at Monticello, Jonesboro, Batesville, Central Arkansas and the state fair at the University of Central Arkansas in Conway. It is conducted as an affiliated regional fair, following the state and national mandated rules governing research and the presentation/display of results. Students participated in 17 project categories.

- Animal Sciences
- Biochemistry
- Cellular and Molecular Biology
- Chemistry
- Computer Science
- Earth and Planetary Science
- Energy and Transportation
- Engineering: Electrical and Mechanical
- Engineering: Materials and Bioengineering

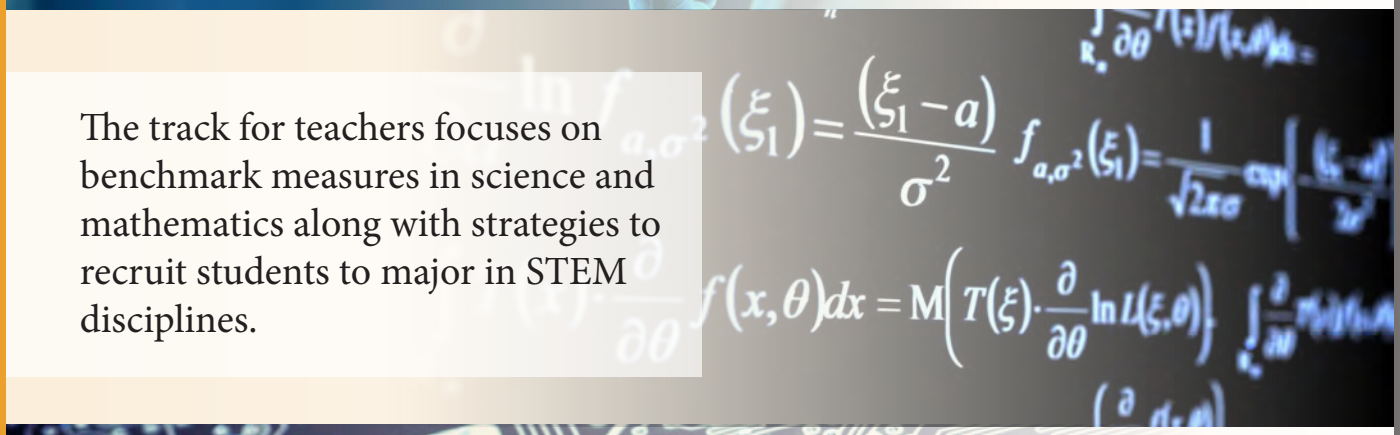
Science Fair 2015 Winner, Ashley Selman
9th grade Ridgway Christian High School
Concrete Beam Test

- Environmental Management
- Environmental Sciences
- Mathematical Sciences
- Medicine and Health Sciences
- Microbiology
- Physics and Astronomy
- Plant Sciences
- Social & Behavioral Sciences Teams

UAPB STEM SATURDAY ACADEMY

University of Arkansas Pine Bluff
STEM Saturday Academy
for Area High School Science and Mathematics Teachers and Students

Each year a number of 10th-12th grade students are selected to attend the STEM Saturday Academy where they conduct experiments in various science, technology, engineering and mathematics (STEM) areas.



The track for teachers focuses on benchmark measures in science and mathematics along with strategies to recruit students to major in STEM disciplines.

In 2015, the STEM Saturday Academy students conducted experiments in the areas of Chemistry, Biology, Computer Hardware, Computer Animation, Industrial Technology, Mathematics, Robotics, Global Positioning Systems (GPS) and Geographic Information System (GIS).

STEM SUMMER ACADEMY

The STEM Summer Academy is a bridge program that offers the necessary skills and knowledge to pre-college high school graduates to help make a seamless transition to college. STEM Scholars receive room and board. The STEM Scholars Summer Academy is designed to enhance, enrich, and refresh the incoming freshmen in mathematics, chemistry, technical writing skills, biology, social decorum, and campus survival skills. Student achievement is assessed during and after the program.

HBCU-UP offered a seven week STEM Scholars Summer Academy for a total of twenty-six students in 2015. Each student received room and board for the length of the six week period as well as a stipend for attending the Summer Academy.

ARK-LSAMP offered a six week Pre-First Year Summer Institute in 2015. Each student received room and board for the length of the six week period as well as a stipend for attending the Summer Institute Students in the program are drawn from six four-year colleges/ universities in the 10-member alliance.

TYPICAL DAILY ACTIVITIES

6:15A-7:00A Physical Fitness
7:00A-8:00A Breakfast
8:10A-9:30A Mathematics
9:35A-10:55A Biology LAB
11:00A-12:00P Technical Writing
12:00P-1:15P Lunch
1:20P-2:40P Chemistry LAB
2:45P-3:45P Coll Surv/Comp Sci
4:00P-4:45P Professional Dev.
4:50P-5:30P Dinner
6:30P-8:30P Tutorial/Study Time

STEM SCHOLARS ACADEMY (HBCU-UP)

The National Science Foundation (NSF) awards HBCU-UP grants to help increase the number of under-represented minority students (URM) in the areas of Science, Technology, Engineering and Mathematics. The University of Arkansas at Pine Bluff (UAPB) has formed partnerships with eight targeted school districts and with research institutions in planning a comprehensive program to increase the number of URM students in STEM areas. The program consists of a transitional summer academy, mentoring, research internships, faculty development, equipment upgrades, curricula redesign, guest lecture series, and infrastructure enhancement.

At the STEM Scholars Academy the scholars are expected to perform and transition from college students to knowledgeable professionals within one of the STEM areas. While obtaining their education, STEM Scholars perform research projects that will further enhance their knowledge of their field of study.

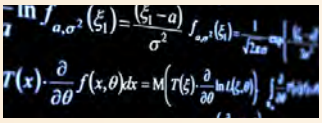
The University of Arkansas at Pine Bluff STEM Scholars Academy includes students from the following disciplines:

BIOLOGY
Prepares students for careers in research, health sciences, and related fields

CHEMISTRY
Prepares students for careers in chemistry or work in research

COMPUTER SCIENCE
Prepares students for careers in the computer industry, advanced graduate studies in information sciences, or work as computer programmers

INDUSTRIAL TECHNOLOGY MANAGEMENT AND APPLIED ENGINEERING
Prepares students for diverse careers such as production management, electronics design, quality control management, construction management, quality engineering, and inventory management



MATHEMATICS
Prepares students to become statisticians or for related careers with emphasis on data-based problem-solving and decision-making

PHYSICS
Prepares students for careers in diverse areas such as engineering, research, work as a physicist or science educator

PLANT AND ANIMAL SCIENCES
Prepares students for graduate school and careers in the areas of plant and animal sciences

Requirements to become HBCU-UP STEM Scholar

- Must have a high school GPA of 3.0 or higher
- Must have a composite ACT score of 19 or above
- Must complete all application requirements and forms to be submitted to the institution
- Must declare a STEM major

Students accepted into the HBCU-UP STEM Scholars program are required to attend regular weekly meetings. Each STEM Scholar will also receive a paid research experience throughout the Fall and Spring semesters upon adhering to all of the requirements of the program and based on award of external funding.

ARKANSAS LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (ARK-LSAMP)

The National Science Foundation funds STEM alliances to increase the number of underrepresented minority students in STEM majors and graduates from campuses that have developed a collaborative plan with a shared vision to increase the number of underrepresented minority STEM professionals.

ARK-LSAMP Member Institutions

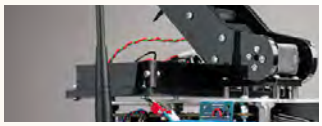
University of Arkansas at Pine Bluff
Arkansas State University
Philander Smith College
Phillips Community College of the University of Arkansas
Pulaski Technical College
University of Arkansas, Fayetteville
University of Arkansas at Little Rock
Southeast Arkansas College

ARK-LSAMP has not only helped to prepare its students for campus leadership positions, it has also provided rich research internship experiences for the students. Among the eight ARK-LSAMP programs, there were 80 internships provided with five being international. Many of these sites were cultivated through the Guest Lecturer Series which has manifold purposes: role modeling of STEM professionals, first hand contact by university, industry and governmental agency representatives with STEM students; and introduction of students to diverse research models, sites and the following STEM disciplines:

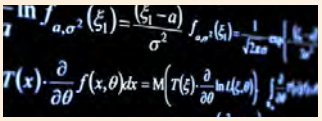
BIOLOGY
Prepares students for careers in research, health sciences, and related fields

CHEMISTRY
Prepares students for careers in chemistry or work in research

COMPUTER SCIENCE
Prepares students for careers in the computer industry, advanced graduate studies in information sciences, or work as computer programmers



INDUSTRIAL TECHNOLOGY MANAGEMENT AND APPLIED ENGINEERING
Prepares students for diverse careers such as production management, electronics design, quality control management, construction management, quality engineering, and inventory management



MATHEMATICS
Prepares students to become statisticians or for related careers with emphasis on data-based problem-solving and decision-making

PHYSICS
Prepares students for careers in diverse areas such as engineering, research, work as a physicist or science educator

PLANT AND ANIMAL SCIENCES
Prepares students for graduate school and careers in the areas of plant and animal sciences

Requirements to become an ARK -LSAMP STEM Scholar

- Must have a high school GPA of 3.0 or higher
- Must have a composite ACT score of 19 or above
- Must complete all application requirements for admission to ARK-LSAMP institutions
- Must declare a STEM major at one of the Alliance Institutions

STEM students accepted into the ARK-LSAMP program are required to attend regular weekly meetings. Paid research experiences are offered during the Fall and Spring semesters. This is in compliance with grant guidelines for the program and based on availability of grant funds.

ARKANSAS LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (ARK-LSAMP)

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University of Arkansas at Pine Bluff STEM ACADEMY Advances in Bioinformatics

Dr. Karl Walker is an assistant professor of Mathematics and Computer Science at the University of Arkansas at Pine Bluff (UAPB). Dr. Walker began his work at UAPB after earning his Doctorate (Ph.D.) in the area of Bioinformatics. Since that time, Dr. Walker has established a Bioinformatics research lab in which he trains undergraduate and graduate students.

According to Dr. Walker, "Bioinformatics is an interdisciplinary field which combines knowledge of computer science with knowledge of molecular biology in order to better investigate complex biological molecules such as DNA and proteins." In his first year at UAPB, he received a Pilot Study Grant from the Arkansas INBRE program (see http://brin.uams.edu) to obtain more mentored training in proteomics and bioinformatics. The INBRE grant also helped him to solidify his commitment to establish a career in academia with a particular emphasis on involving undergraduates in bioinformatics research.

Dr. Walker's research interests are primarily in the area of computational protein structure comparison and prediction. However, Dr. Walker has experience in collaborative research projects, including working as a Co-Investigator on an NSF-funded No Boundary Thinking project; as the Bioinformatics Core-Lead on the NSF-funded Plant Imaging Consortium; and as a Co-Investigator on a Lung Cancer study at the University of Arkansas for Medical Sciences (UAMS). He also represents UAPB on the Arkansas Bioinformatics Consortium (http://www.arkansasbioinformatics.org/about-arbic.htm), and is an associate member of the UALR Center for Molecular Design and Development. During his second year at UAPB, he also initiated a collaboration with Dr. Alan Tackett to become involved in proteomics studies with biomedical research implications.

Dr. Walker has co-authored three manuscripts in the field of bioinformatics and has given more than 10 presentations at regional, national, and international meetings. His students have had many opportunities to attend and present their research at regional, national, and international conferences, including conferences in Washington, D.C. and Kingston, Jamaica.

Dr. Walker earned both an MS and Ph.D. in bioinformatics from the University of Arkansas at Little Rock (UALR) and the University of Arkansas for Medical Sciences (UAMS). He is a 2002 honors graduate of Morehouse College and a 1998 graduate of Pine Bluff High School.

University of Arkansas at Pine Bluff

The GREEN MOBILE

A Winnebago Turned Solar-Energy Laboratory

The GREEN Mobile was created through an Arkansas Energy Office grant and support from the Arkansas EPSCoR Program, ASSET Initiative II. The Energy Office is a division of the Arkansas Economic Development Commission.

The mobile lab features six 235-watt solar panels mounted on the driver's side that can power all elements of the lab and can be used for solar energy demonstrations. The GREEN Mobile has been based at the University of Arkansas in Fayetteville for the last three years, but in 2015 was transferred to the University of Arkansas at Pine Bluff.

The GREEN Mobile was created to expose Arkansas students to fun and interactive projects in the science, technology, engineering and mathematics fields.

"The GREEN Mobile is an extremely valuable educational tool for Arkansas, Gail McClure, Arkansas National Science Foundation EPSCoR director, said in a news release. It has been used in programs in Northwest Arkansas for the past three years and we are excited about the opportunity to move it to UAPB. This transfer provides an opportunity for schools in central and south Arkansas to have access to programs on solar energy."

UAPB STEM SCHOLARS ENGAGE IN GLOBAL INTERNSHIP EXPERIENCES

2014-2015 INTERN SITES

American Greetings, Inc.
Arkansas Center for Space and Planetary Science
Arkansas INBRE
Ball Aerospace & Technologies Corporation
Boeing Corporation
Booz, Allen and Hamilton
Boston Scientific
Census Bureau
Children's Defense Fund Freedom Schools
Cincinnati Children's Hospital
City of Pine Bluff
Cornell University
Dale Bumpers National Rice and Research Center
Dallas Zoo
Department of the Army, Joint Munitions Command
Eaton Corporation
Genentech
General Motors
Graduate/Florida A&M University
Graduate/General Election Aviation
Graduate/Purdue University
Graduate/University of Arkansas for Medical Sciences
Graduate/University of Tennessee at Knoxville
Hensel Phelps Construction, Co.
Iowa State University
Jackson State University
John Deere
John Hopkins University
Johnson & Johnson Corporation
Monsanto
NASA Science and Technology Institute
National Center for Toxicological Research
National Oceanic Atmospheric Administration
Nationwide Children's Hospital
Natural Resource Conservation Service
North Dakota State University
North Texas Health Science Center
Nucor Yamato Steel
Oak Ridge National Laboratory
Pine Bluff Arsenal
Pine Bluff School District
Proctor and Gamble
Ring
Rockwell Collins
Texas A&M University-Biochemistry & Biophysics Dept.
Texas Highway Department of Transportation
The Pennsylvania State University College of Medicine
Tri-State International
Tyson Foods, Inc
United Health Science Center
United States Steel
United Water
University of Alabama- Tuscaloosa
University of Arkansas Fayetteville
University of Arkansas at Pine Bluff
University of Arkansas for Medical Sciences
University of Central Arkansas
University of Cincinnati
University of Louisville
University of Michigan
University of Minnesota
University of North Texas Health Science Center
University of Pittsburgh
University of South Florida
University of Utah School of Dentistry
URS Corporation - Washington Group
Vanderbilt Summer Science Academy
Vector Marketing
Walmart
Walt Disney World
Washington School of Medicine
Washington State University

GRADUATE SCIENCE ENRICHMENT PROGRAM

Through a grant from the U.S. Department of Education HBCU Master's Degree in STEM Area Enrichment, the STEM Academy offers, in collaboration with the School of Education, enriched Master's degrees in Science and in Mathematics Education. The grant includes assistantships, funds to develop a new master's degree in Computer Science and Technology and $1.5M for construction of the STEM Academy and Conference Center.

Persons with bachelor degrees from regionally accredited colleges and universities in mathematics, science, and computer science or technology can apply for the graduate assistant positions. Graduate assistants (GAs) will be teaching assistants (seeking licensure) or research assistants (licensed) to perform extensive academic research in the field of mathematics or science as assigned by a professor or principal investigator of a research project. GAs will assist with grant applications, correspondences, research, and research writing. Additionally, they will assist professors with instructional responsibilities that will consist of developing technological products and handouts, tutoring, conducting research, preparation of formal presentations, and assist in laboratories and other mathematics/science related activities.

Qualifications

1. Bachelor's degree in mathematics or mathematics education, science or science education, or computer science (computer information systems or technology) or bachelor's degree with 30 hours or more in a one of the above listed licensure areas (Courses must have the appropriate prefix to support that area).
2. Passing scores on all parts of Praxis I
3. Completed application (that includes a one-page narrative highlighting the applicant's professional experiences in science, technology, engineering and/or mathematics. Also, this narrative should discuss the applicant's commitment to teaching in a secondary education public school in the area of mathematics, science or a computer science related area).
4. Resume`
5. Official transcript
6. Undergraduate grade point average of 3.0 cumulative or 3.0 in the major
7. Interview by admission committee
8. Entering student (that is, one who has not previously begun a degree in a graduate mathematics- or science- related area).

STEM SCHOLARS INTERNSHIPS

Mercedes Winfrey
NASA

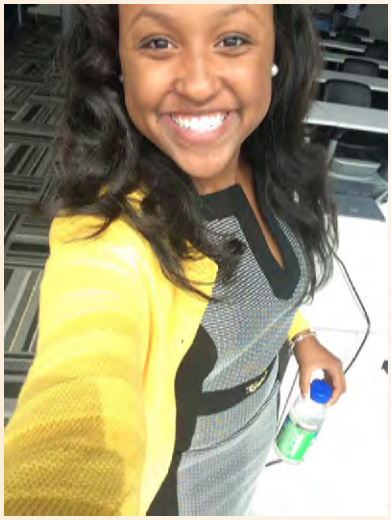
This past summer, I was an intern at the Kennedy Space Center located in Merritt Island, Florida. At this NASA facility, I participated in a program called the Launching 2 Learn (L2L) Project. During this experience, students were required to build, launch, and successfully retrieve level 1 and level 2 high powered rockets, eventually becoming level 1 certified by NAR, the National Association of Rocketry. Additionally, we were instructed to do a research analysis of a level 2 K445 rocket flight in groups of four. Our research analysis consisted of figuring out the correct apogee, velocity, and burn time using preflight estimates calculated utilizing algebra and calculus equations and also a rocket simulation called Open Rocket. In the lab, we were responsible not only for the calculations and the building of the rocket, but also for installing and programming an on-board altimeter bay/electronics bay. Post flight, we compared our predictions to the actual flight analysis and presented the conclusion of our outcome.

I support diversity in the sciences simply by applying myself and conquering the task set before me. I recognized this most when attending the NASA L2L program. Being the only African American woman in the group of 19 other caucasian students, I was quickly noticed. This opportunity was not only an amazing learning experience, but also a helpful networking platform. Just walking through the facility, I was stopped multiple times by other African American staff members, and by majority women. These people took interest in me and began to exchange information because of the rarity of seeing a student intern like myself. Going against the grain and working toward my goals make the challenges faced in the field of physics rewarding. Being a minority scientist makes me appreciate the difficulties that women of color have faced in the past and the difficulties I will face in the future.

STEM SCHOLARS INTERNSHIPS

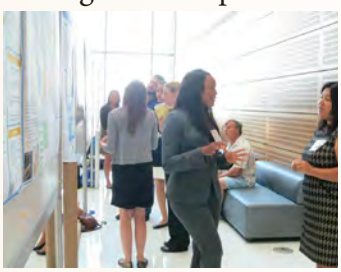
Marquise Ealy
STANT Corporation

I enjoyed my experience working with this company. I learned of the different metals, plastics, and copper used in the products. This company's main objective is to provide customers with filler pipes, thermostats, and fuel caps. It is an automotive manufacturing facility. My responsibilities were endless but were necessities to the company functioning. I had to report which materials were scrapped or reworked every day and the quantity of each. I also had to create special spreadsheets for that data. I was in charge of organizing the company's local network and reporting regularly. I visually inspected more than 60,000 automotive parts. I have participated in their annual inventory event twice in which they count every material they have in their facility. I also performed daily audits to guarantee that the machines, operators, or material were defect free. I have saved the company money and implemented some of my own processes while there.



Aliyah Glover
University of Buffalo
CLIMB Program

I participated in a 10 week residential program for students interested in pursuing a medical degree or MD/PhD. I engaged in a week-long short course in laboratory skills training that was used during my research. I collaborated with my mentor and peers in the Division of Behavioral Medicine and Department of Pediatrics and investigated the effects of maternal smoking in lactation on infant weight and length outcome. In completion of the program, I presented my research during the campus-wide Summer Research Day Symposium. The internship helped me to gain additional knowledge, connections, friendships, and confidence. Being around others who were working hard, trying to reach the same goal as I, not only encouraged me to continue to excel but also built my confidence in my ability to continue to succeed in the future.



STEM SCHOLARS INTERNSHIPS

Marcus Hampton
EATON Corporation and Toyota

The summer and fall of 2015 was a very productive time for me. I spent the summer working for Eaton Corporation as a manufacturing engineer. Then I spent the fall working at Toyota as a design engineer. These experiences were very similar when it comes to being challenged but were two very different environments.

When I first heard that I would be working for Eaton, I was very excited. It is a very large power management company that also specializes in making industrial products. They are known widely at UAPB as hiring one or two of our graduates a year. So I knew that it would be a good opportunity for me. The plant produced gears and valves and made about 50,000 to 100,000 a day depending on the order. As an intern, my job was to save $25,000 over the course of the summer. The work was pretty intense at first and I was both confused and frustrated. However to get over the learning curve, I was paired with a mentor who gave me great ideas to implement. Also talking to the machinists and operators helped a lots too. After about two months, I was pretty much an expert and planned out and installed a couple of tooling measures that helped me to save $25,000 over the summer. I also participated in a cost saving study for a nitride dip tank and ended up with $115,000 avoidable cost if purchased in a timely manner.

My fall was spent working in Erlanger, KY for Toyota Motor Engineering and Manufacturing North America. Toyota was a great experience. They are the number one car company in the world. The experience was very different then the plant life at Eaton. I was mainly in a corporate office and took supplier trips. We would view their technology and give them dates of when we need the parts and then parts would be shipped to the plants where they are then assembled. On the day to day basis, I worked on Catia and Autoform programs. I would manipulate parts in a program to see if there were a cheaper or easier way to produce the part. Also, I cataloged all the hot stamping parts for the 2017 Toyota Camry.
The internship at Eaton and Toyota gave me a great platform which to strengthen my resume and to build my savings.

These experiences gave me a great platform to build my resume and put a lot of money in my pocket. I am very thankful to be able to be given such an opportunity. I have learned so much and have received a full time offer to work for Eaton in Searcy, AR in their Leadership Development Program. I was offered a position at a Eaton location at Kearney, NE along with a handsome salary.

The University of Arkansas at Pine Bluff and the STEM Academy hosted Destination Imagination in March 2015. More than 1200 students, parents, judges, Destination Imagination officials and guest attended the fantastic event of bridging the gap and challenging the students with STEAM-based (Science, Technology, Engineering, Arts and Mathematics) challenges.

"All children should have access to quality education that will prepare them for success in an ever-changing world."

Dr. Chuck Cadle
Destination Imagination
CEO

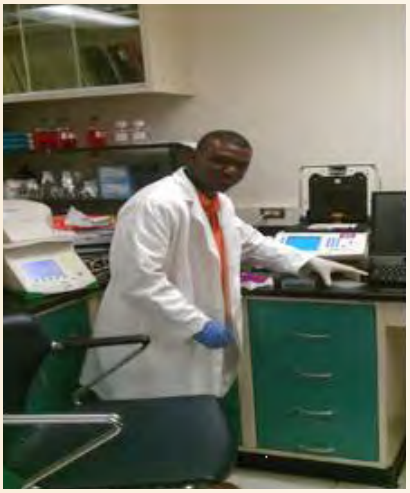
Source: www.DestinationImagination.com

STEM GRADUATES Fall 2005 - Fall 2015

Major Group	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	**One (1) Year % Change AY 2013-14 to AY 2014-15**	**Ten (10) Year % Change AY 2004-05 to AY 2014-15**
Agriculture Science	19	23	30	24	19	27	13	14	30	24	22	-8.3%	15.8%
Chemistry	2	4	1	2	3	8	5	10	6	4	9	125.0%	350.0%
Computer Science	12	10	6	7	4	8	11	11	11	10	12	20.0%	0.0%
Industrial Technology	12	26	17	22	21	15	28	30	26	39	19	-51.3%	58.3%
Biology	29	17	24	25	22	19	17	32	32	45	36	-20.0%	24.1%
Mathematics	2	1	1	2	2	2	0	2	2	1	2	100.0%	0.0%
Physics	0	1	0	0	1	0	1	3	0	1	1	0.0%	100.0%
TOTAL - STEM	**76**	**82**	**79**	**82**	**72**	**79**	**75**	**102**	**107**	**124**	**101**	**-18.5%**	**32.9%**
Percent Change	- -	7.9%	-3.7%	3.8%	-12.2%	9.7%	-5.1%	36.0%	4.9%	65.3%	-5.6%	-108.6%	- -
TOTAL - UAPB (UG)	420	372	376	365	401	375	382	461	394	429	359	-16.3%	-14.5%
%STEM/ TOTAL UAPB UG	**18.1%**	**22.0%**	**21.0%**	**22.5%**	**18.0%**	**21.1%**	**19.6%**	**22.1%**	**27.2%**	**28.9%**	**28.1%**	**-2.7%**	**55.5%**

HBCU-UP Master's Programs	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	One (1) Year % Change Fall 2014 to Fall 2015
Mathematics Education	0	1	0	0	0	0	0	1	0	1	0	-100.0%
Science Education	1	1	1	2	0	1	2	1	1	3	0	-100.0%
Computer Science & Technology	-	-	-	-	-	-	-	-	-	7	5	-28.6%
TOTAL - STEM	**1**	**2**	**1**	**2**	**0**	**1**	**2**	**2**	**1**	**11**	**5**	**-54.5%**
TOTAL - UAPB (GR)	29	27	31	22	24	34	21	37	35	26	18	-30.8%
%STEM/ TOTAL UAPB	**3.4%**	**7.4%**	**3.2%**	**9.1%**	**0.0%**	**2.9%**	**9.5%**	**5.4%**	**2.9%**	**42.3%**	**27.8%**	**-34.3%**

University of Arkansas at Pine Bluff STEM SCHOLAR GRADUATES EXCELL



Jarren Oates

Jarren is a 2014 graduate from the University of Arkansas at Pine Bluff where he received his Bachelor's Degree in Biology. During his undergraduate career at UAPB he became an active member of the UAPB ARK-LSAMP STEM Scholars program. STEM provided him with invaluable experiences and networking opportunities with both professionals and college peers across the nation that will last him a lifetime. After graduation, Jarren continued his education by enrolling in UAPB's Masters of Science in Secondary Education Life Sciences program with funding from the U. S. Department of Education. STEM awarded Jarren an assistantship that allows him to teach entry level biology labs on campus. The graduate program has served as a two-fold purpose for Jarren. Not only has he gained invaluable experiences as an instructor but also his students have received enriching laboratory experiences that they will carry with them throughout their lives. Jarren is expecting to graduate in the Fall of 2017, afterwards he plans enroll in a Ph.D program in Immunology.

Delois Oates

Delois is a 2014 graduate from the University of Arkansas at Pine Bluff. She received her Bachelors in Biology. During her undergraduate career she was exposed to the STEM program becoming a STEM scholar. STEM provided her numerous resources for academic success. After graduation, Delois continued on the STEM track and enrolled in UAPB's graduate school. She is currently matriculating through the program to earn a Master's in Secondary Education Life Science. Delois was awarded a STEM graduate assistantship that allows her to teach lower level biology labs on UAPB's campus. Teaching labs provides Delois the opportunity to gain valuable experiences while simultaneously exposing students to hands-on lab techniques. Delois is eagerly awaiting graduation in the fall to continue working in the biology field.

Delois and Jarren Oates were married while in STEM Academy.

University of Arkansas at Pine Bluff
STEM SCHOLAR GRADUATE EXCELL

Courtney Monk I graduated from the University of Arkansas Pine Bluff with a Bachelor's of Science in Computer Science in December 2010. I took a small break after graduating to continue looking for jobs. I decided in February 2011 to start a Master's program online with Keller Graduate School of Management in Information Systems Management focusing in Information Security. I started working for Arkansas Electric Cooperative Corporation in January 2012 as an Engineering Analyst and was promoted. I got promoted fairly quickly, but I was not content not working in I.T. I ended up going to work for HP Enterprise Services in Little Rock in January 2013 until November 2014.

I started with Walmart Information Systems Division in February 2015, and work in Information Security – the area focused solely on protecting Walmart's assets, customer data, and more. I work on the Enterprise Security Testing Team, which is a penetration testing team full of ethical hackers. An ethical hacker is a person who hacks into a computer network in order to test or evaluate its security, rather than with malicious or criminal intent.

On the team, I do some technical work involving programming, but I mainly prepare the legwork for the ethical hackers to test specific projects by communicating with the customers. I am going to start getting mentored on ethical hacking this year. Who knows!? I may be an ethical hacker soon. It's my goal to get my Ph.D by 2018 so I have started researching potential programs.

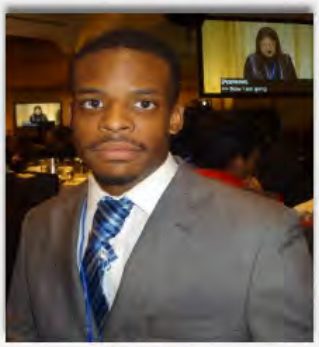
I am so thankful for my UAPB & STEM journey. It has helped me so much along the way in life. This program helps us to underscore the findings listed in this article titled "HBCU Alumni Are Thriving More Than Black Grads of Other Schools, Study Shows." See http://www.huffingtonpost.com/entry/hbcu-alumni-are-thriving-more-than-black-grads-of-other-schools-study-shows_us_56310c1be4b0631799107aaa

Courtney Monk, MISM
Systems Engineer
ISD Enterprise Security Testing
Courtney.Monk@walmart.com

UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

2014-2015 STEM Academy Graduates

Biology


Andra Bates


Ayla Bell


Kalebra Blair


Asia Colen


Kayla Gardner


Raven Handley


Miaya Holliman


Charnesia Jackson


ShaKuemie McShan

UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

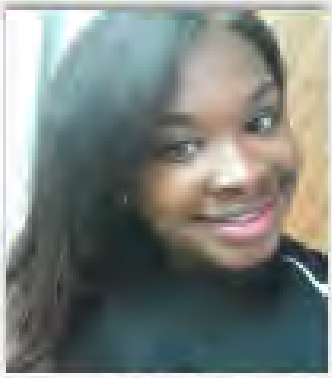
2014-2015 STEM Academy Graduates


Taylor Osborne

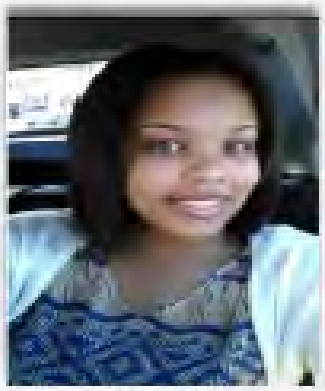

Joslyn Porter

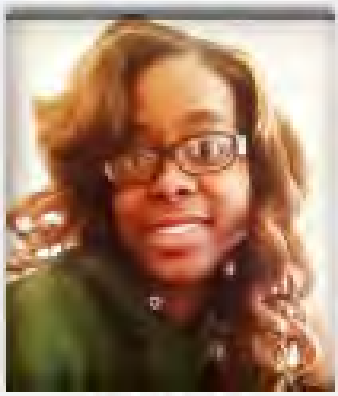

Kymberly Wimberly

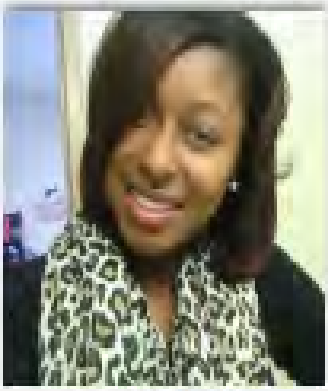
Chemistry


Alyssa Cobbs


Skylar Connor


Andrea Jenkins


Jamila Leonard

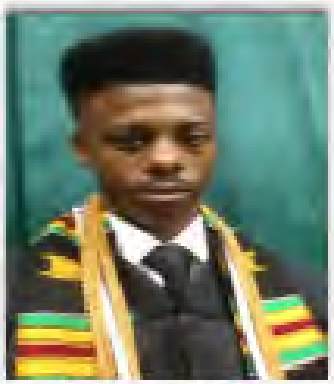

Twymenia Liggins


Jasmine Washington

UNIVERSITY of ARKANSAS AT PINE BLUFF 1873

2014-2015 STEM Academy Graduates

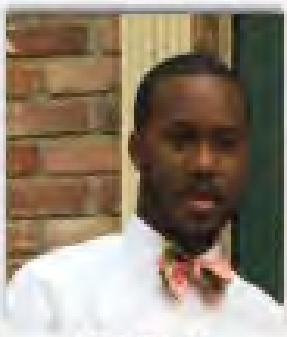
Computer Science, Industrial Technology and Mathematics


DaJerrian McHenry


Jonathon Britt

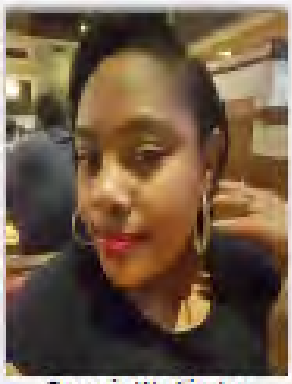

Michelle Corbin

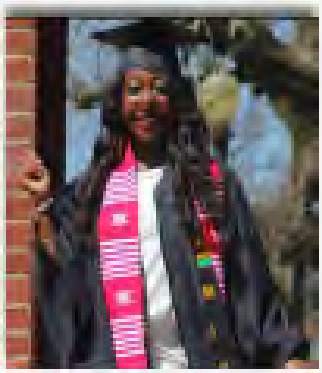

Willie Amari Fulton, Jr.


Kendall Harris


Christopher Jones


Kevin Smith, Jr.


Cornesia Washington


Moriah Ester


LaCreasha Stewart

2015 Conferences and Activities

The seventh ARK-LSAMP Spring Research Conference was held at the Embassy Suites Hotel in Little Rock, AR on April 17-18, 2015. ARK-LSAMP students benefited from interactions with administration officials and student participants from other institutions. Over one hundred twenty persons were registered. There were two student oral presentations by Nora Bouzihay and Andra Bates over summer and campus research experiences and fourteen poster presentations. The Opening Session Keynote speaker was Dr. Tasha Inniss, NSF LSAMP Program Director. She spoke to students about her career path, her experiences in un-dergraduate and graduate school and life-learned lessons to be successful in a STEM field. A lot of stimulating questions and answers came from her session.

As in years past, a main focus of the conference was graduate school and the STEM opportunities available to students. Dr. Malathi Srivatsan from Arkansas State University presented in-formation on the Bridging the Divide Graduate Program and graduate school opportunities in Molecular Biosciences and Environmental Sciences through partnernships with Philander Smith College and the University of Arkansas at Pine Bluff. The banquet speaker was Chan-cellor Laurence B. Alexander-Chancellor of the University of Arkansas at Pine Bluff. Students also benefited from information shared from Alliance member faculty and administrators.

The Annual Spring Research Conference has grown in attendance every year since the first conference was held in Little Rock, AR on the campus of the University of Arkansas at Little Rock in 2009. The opportunities for research, internships and networking have proven successful over the span of years.

Emerging Researchers National (ERN) Conference

UAPB Biology major is pictured with award winners. Andra Bates won first place for his presentation on "Does HIV-1 Manipulate Cellular Stress Responses."

The Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathmatics (STEM) is hosted by the American Association for the Advancement of Science (AAAS), Education and Human Resources Programs (EHR) and the National Science Foundation (NSF), Division of Human Resources Develoment (HRD), within the Directorate for Education and Human Resources Programs (EHR). The objectives of the conferences are to help

Emerging Researchers National (ERN) Conference in STEM in Washington, DC

ACKNOWLEDGEMENTS

Funding Partners

The UAPB STEM Academy expresses deep appreciation to all who contribute to its successful outcomes. Special appreciation is extended to our funding agencies and individuals.

- ***The National Science Foundation***
- ***The U.S. Department of Education***
- ***The Arkansas Science and Technology Authority***
- ***The University of Arkansas at Pine Bluff***
- ***The Arkansas Legislative Assembly***
- ***The Honorable Governor Mike Beebe***
- ***The Honorable Senator Linda Chesterfield***
- ***The Honorable Representative Charles Armstrong***
- ***Title III Program (funded through the U.S. Department of Education, Office of Post Secondary Education, Institutional Services)***
- ***The Taxpayers of Arkansas***
- ***St. Paul Missionary Baptist Church***
- ***Dr. Carolyn Blakely***
- ***Bell Community Services***

All donors are deeply appreciated.

- Mary E. Benjamin, Principal Investigator

University of Arkansas at Pine Bluff

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