

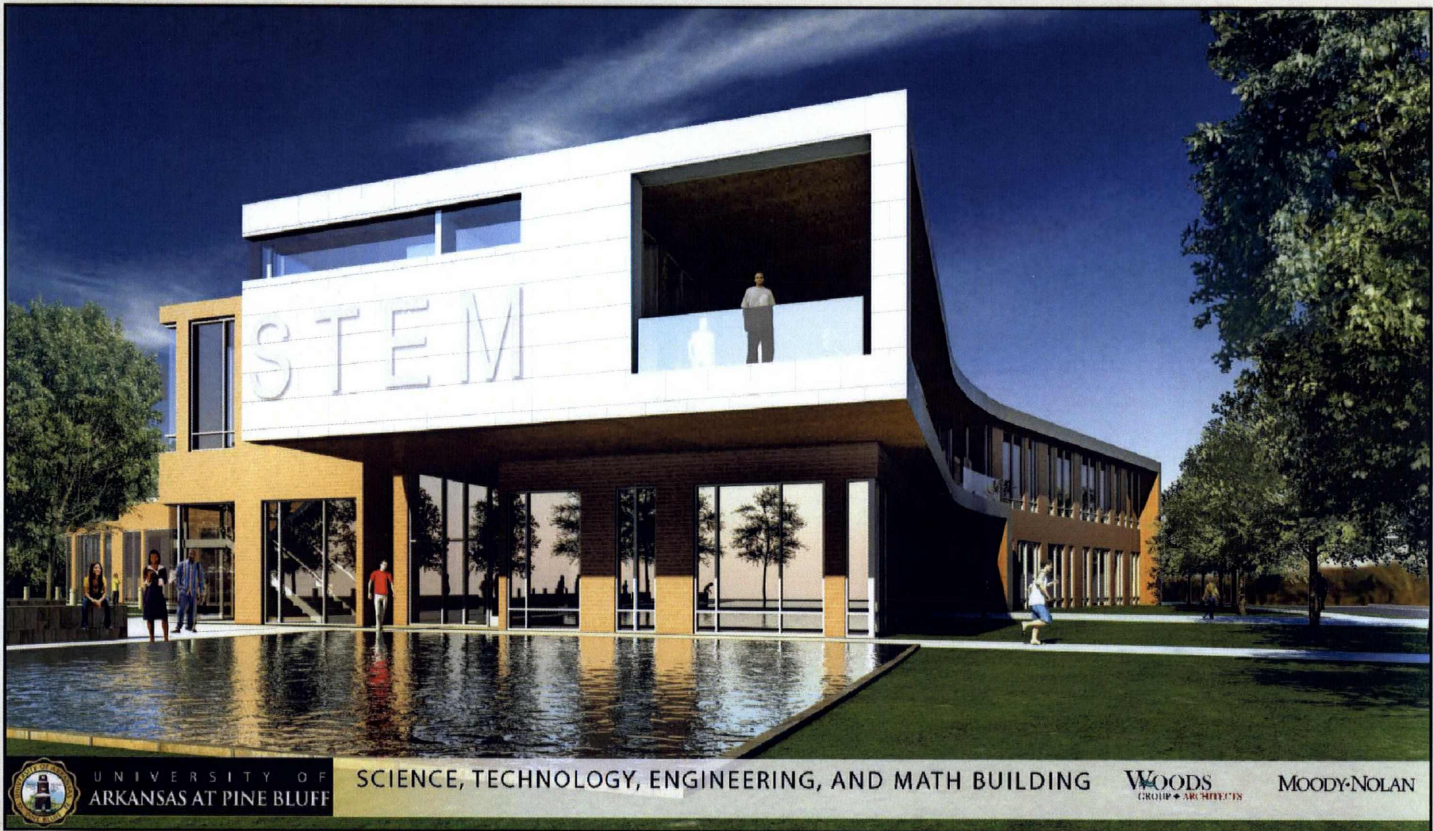
UNIVERSITY OF ARKANSAS AT PINE BLUFF

# STEM

*Science, Technology, Engineering, Mathematics*



FALL 2012 - Revised



UNIVERSITY OF  
ARKANSAS AT PINE BLUFF

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH BUILDING

WOODS  
GROUP • ARCHITECTS

MOODY-NOLAN

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

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## PURPOSE OF UAPB STEM SCHOLARS ACADEMY

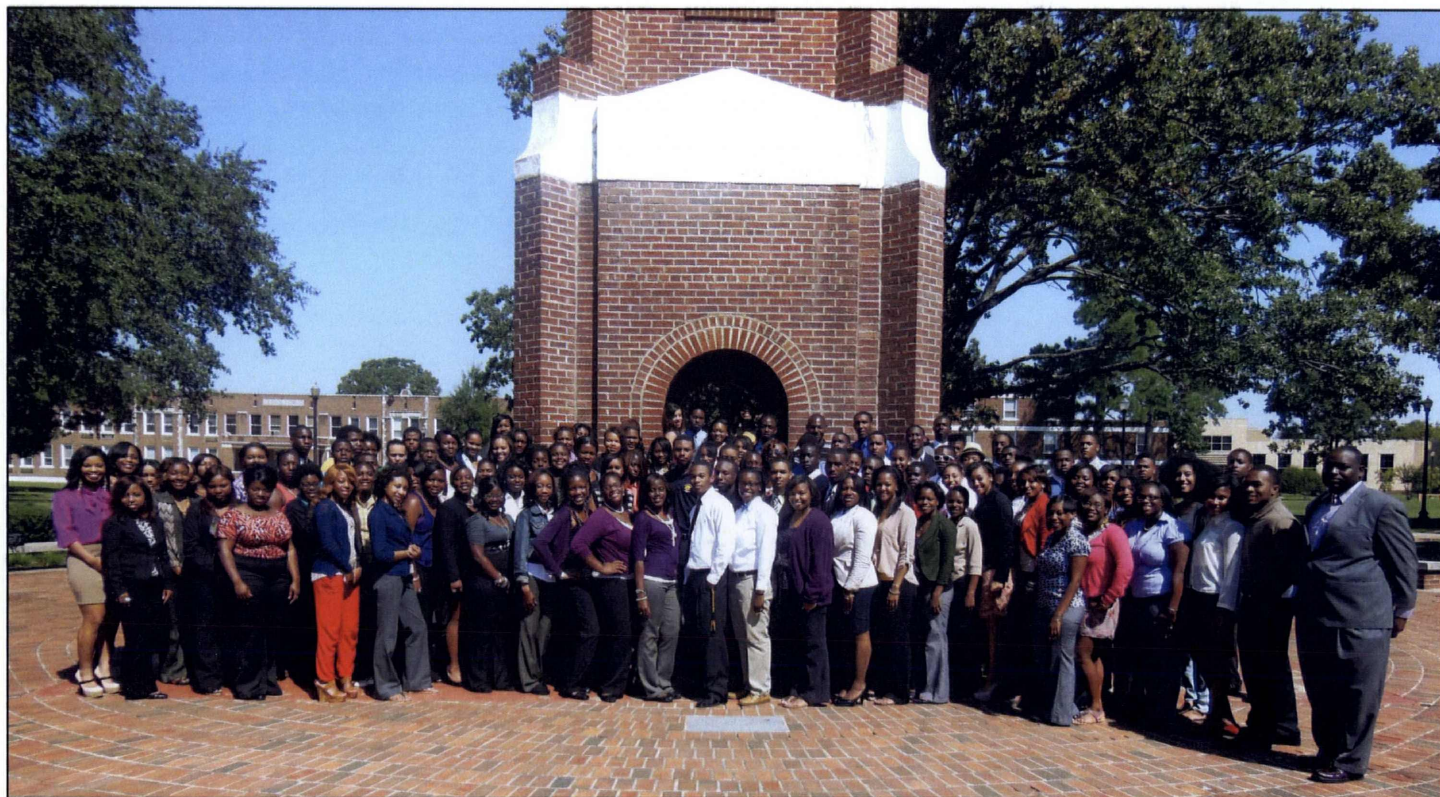
The UAPB STEM Academy is a well integrated set of enrichment programs designed to help meet local, state and national human resource needs in STEM areas. As an HBCU with a land grant mission, the University of Arkansas at Pine Bluff (UAPB) has a legacy of service to underserved, rural and minority populations. 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.

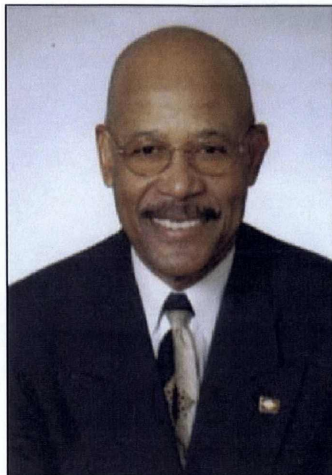
Disciplines include: *chemistry, mathematics, physics, computer science, biology, plant and animal sciences, and industrial technology.*

## STEM SCHOLARS ACADEMY



*Fall 2012*

# LETTER FROM THE CHANCELLOR



It is my distinct pleasure to give the support of this office to the STEM Scholars Academy, a unit which continues to help enrich the university's academic portfolio. I am aware of your great retention rate (87%- Fall 2012) and of the enrichment strategies that are impacting this outcome.

I share with you the excitement of implementing the new M.S. Degree in Computer Science and Technology and join you in expressing thanks to the U.S. Department of Education Master of Science Award for its investment in this new and highly innovative degree.

As the university community readies to participate in the groundbreaking ceremony for the new STEM Academy and Conference Center on November 16, 2012, please remember that this will symbolize the new ground already broken and also the new ground yet to be broken as we all work together, both here and with our partners, to further expand the opportunities for a diverse cadre of students to better prepare for STEM careers as they experience the wonders of science and research.

Thank you for all that you have done and please know that we anxiously await the outcomes for STEM yet to unfold here at the University of Arkansas at Pine Bluff.

Sincerely,

A handwritten signature in black ink that reads "Calvin Johnson".

Calvin Johnson  
Interim Chancellor

UNIVERSITY OF  
ARKANSAS PINE BLUFF™

OFFICE OF THE CHANCELLOR

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An equal opportunity/affirmative action university

# LETTER FROM THE PRINCIPAL INVESTIGATOR

2012 has been fast-paced and productive for the STEM team. In addition to our routine activities of student recruitment, retention, enrichment activities and the pride of watching our STEM Scholars receive baccalaureate degrees, we have also invested numerous hours in planning meetings with Woods Group Architects and more recently with the construction manager in finalizing the plan for the new STEM Academy and Conference Center. Some details of our major program emphasis follow.



**Dr. Mary E. Benjamin**  
Principal Investigator

Our STEM graduates are increasing in numbers. In May 2005, the University of Arkansas at Pine Bluff awarded B.S. degrees to 76 STEM graduates. In May 2012 (plus December 2011), the University of Arkansas at Pine Bluff awarded 105 STEM degrees, an increase of 38%. As these students exit, recruitment is essential. Success in this area is enhanced by our partnership with the Little Rock School District, our staff's active participation in high school visits, the Science Fair Exposition, Lion Fever Day and travel on special recruitment tours sponsored by the Office of Recruitment (ex. Honors Night in Memphis, TN) and alumni sponsored recruitment events, resulted in all slots being filled with students on the wait list. Our total STEM Academy Enrollment in Fall 2012 is 235, including six graduate students. The first to second year retention rate is 87%.

We excitedly await groundbreaking for the new STEM Academy and Conference Center on November 16, 2012. It will be a historic moment for the University of Arkansas at Pine Bluff, a testament to the university's commitment to STEM, and the realization of a dream to first build the program and then build the facility to adequately house the STEM initiatives for now and in the years to come. The building will serve a functional purpose while also serving as a beacon for contemporary and future students who are seeking the excitement, structured curricula and rigor of STEM education and careers. We are appreciative to all who share our vision and have joined hands to ensure that the STEM Academy and Conference Center will be ready for occupancy by Spring semester 2014. We continue to expand our STEM program. In July 2012, the university received final approval for the Master of Science (M.S.) degree in Computer Science and Technology. The development of this degree was one of the major components of our \$3M grant funded by the U.S. Department of Education Master of Science Award. The other two accomplishments include enrichment of the Master of Education (M.Ed.) in Science and Mathematics Education, assistantships and \$1.5M toward the construction of the STEM Academy and Conference Center. This was our first award for the facility.

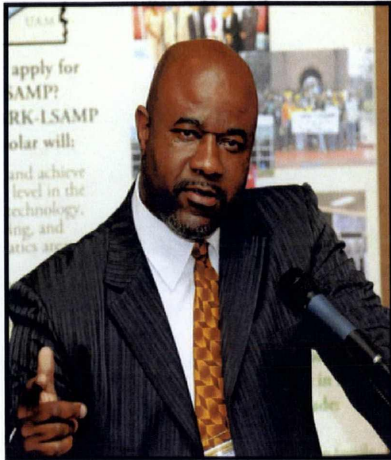
Our STEM faculty, staff and students are excellent ambassadors for the STEM Academy. Some examples of our dissemination/outreach include presentations to the Arkansas Science and Technology Authority Board, the STEM Coalition, the UAPB National Alumni Annual Conference (Charlotte, NC), area high schools, and booths at both Lion Fever Day and Memphis Day here at UAPB. This is the fourth year of our 5-year NSF funded Louis Stokes Alliance for Minority Participation (LSAMP). As such, a major investment of time was devoted to the development of the new proposal. Our eight member alliance (University of Arkansas at Pine Bluff; University of Arkansas, Fayetteville; Arkansas State University; University of Arkansas at Little Rock; Philander Smith College; University of Arkansas at Monticello; Pulaski Technical College; and Southeast Arkansas College) will continue the best practices of the current Alliance, including the Pre-First Year Institute, mentoring, participation in the ARK-LSAMP Annual Research Conference, summer internships, academic year research experiences, and participation in state and national STEM professional meetings. ARK-LSAMP, if funded as a mid-level alliance, will also add another 2-year college, a component for URM veterans who are interested in STEM majors/careers, and increase 2-year to 4-year transfers within the Alliance.

Teamwork, institutional support, and embracement of the program are the keys to success in the STEM Academy. We are indeed fortunate to have all three, and deep thanks are extended to an outstanding professional team here at the STEM Academy. Our sincere thanks are extended to the UAPB administration, all units and divisions and the Title III Program (funded through the U.S. Department of Education, Office of Post Secondary Education, Institutional Services) for steadfast support and embracement. To all of our Alliance members, advisory boards, professional partners and funding agencies, we express deep gratitude. The contributions of each person and organization are truly the warm winds that gently help us sail to the shores that offer the opportunities needed to help prepare the United States' diverse STEM workforce that will help fuel this nation and the global scientific enterprise for now and into the future.

A handwritten signature in black ink that reads "Mary E. Benjamin". The signature is fluid and cursive.

Mary E. Benjamin, Vice Chancellor for Academic Affairs  
University of Arkansas at Pine Bluff

# UAPB STEM ACADEMY LEADERSHIP



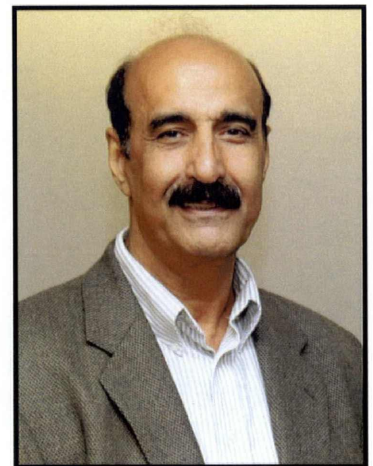
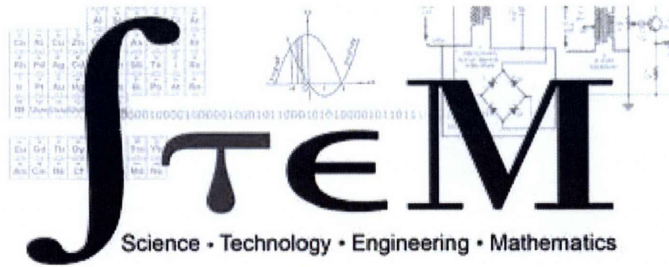
**Dr. Charles R. Colen, Jr.**  
Co-Principal Investigator



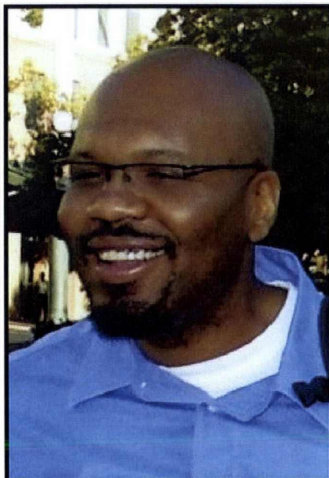
**Dr. Anissa Evans-Buckner**  
Project Director



**Dr. Antonie Rice**  
Chair, Chemistry & Physics



**Dr. Mansour Mortazavi**  
Physics Professor



**Dr. Jessie Walker**  
Computer Science Coordinator

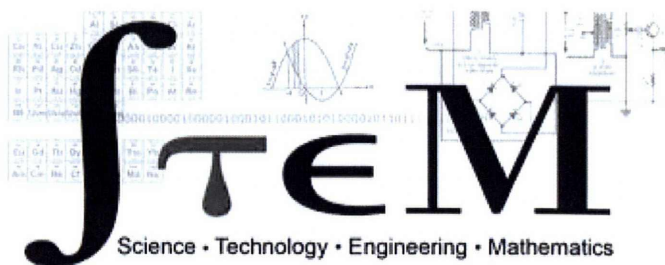


**Dr. Elizabeth Wells**  
Mathematics Assistant Professor

# UAPB STEM ACADEMY STUDENT LEADERSHIP



Nalita Holt (Biology Major)  
**President**



## STUDENT OFFICERS



Taylor Osborne (Biology Major)  
**Vice President**



Chasity White (Biology Major)  
**Treasurer**



Asia Colen (Biology Major)  
**Project Manager**



Khatiana Butler (Chemistry Major)  
**Historian**



Courtney Mazique (Chemistry Major)  
**Secretary**



Angelle Anderson (Biology Major)  
**Assistant Secretary**



Maurice Jordan (Industrial Technology Major)  
**Mr. STEM**



LaCresha Stewart (Mathematics Major)  
**Ms. STEM**

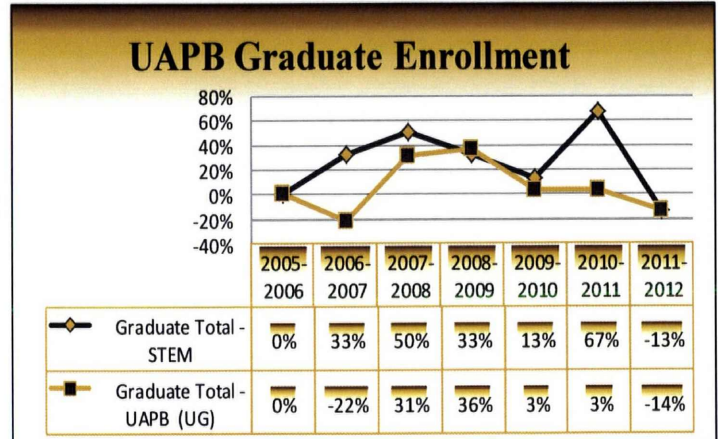
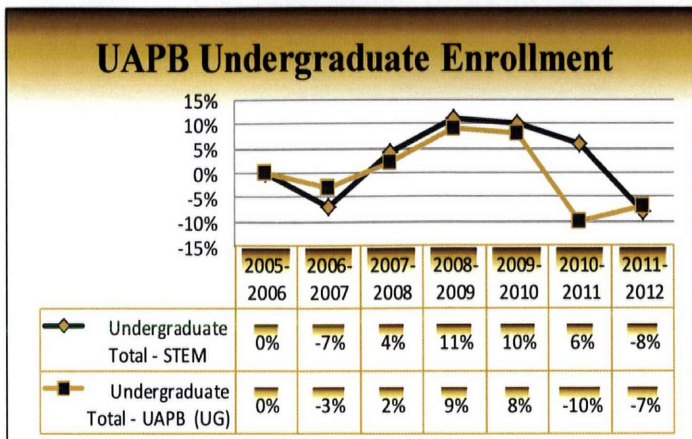
# STEM DATA



## University of Arkansas at Pine Bluff - STEM Enrollment Fall 2004 - Spring 2012

<b>Undergraduate Programs</b>								
	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	% Change Fall 2005/Fall 2011
Agriculture Science	126	131	137	133	160	168	100	-20.6%
Chemistry	27	28	35	44	54	49	52	92.6%
Computer Science	137	110	112	121	127	136	114	-16.8%
Industrial Technology Management and Applied Engineering	136	119	124	157	176	162	158	16.2%
Biology	193	190	187	207	230	269	304	57.5%
Mathematics	44	40	45	49	39	52	34	-22.7%
Physics	4	3	7	5	5	6	7	75.0%
<b>TOTAL - STEM</b>	<b>667</b>	<b>621</b>	<b>647</b>	<b>716</b>	<b>791</b>	<b>842</b>	<b>769</b>	<b>15.3%</b>
<i>TOTAL - UAPB (UG)</i>	<i>3,132</i>	<i>3,051</i>	<i>3,099</i>	<i>3,388</i>	<i>3,651</i>	<i>3,283</i>	<i>3,063</i>	<i>-2.2%</i>
% STEM/ TOTAL UAPB	21.3%	20.4%	20.9%	21.1%	21.7%	25.6%	25.1%	

<b>HBCU-UP Master's Programs</b>								
	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	% Change Fall 2005/Fall 2011
Mathematics Education	0	2	1	3	3	4	5	100.0%
Science Education	3	2	5	5	6	11	8	166.7%
<b>TOTAL - STEM</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>9</b>	<b>15</b>	<b>13</b>	<b>333.3%</b>
<i>TOTAL - UAPB (GR)</i>	<i>99</i>	<i>77</i>	<i>101</i>	<i>137</i>	<i>141</i>	<i>145</i>	<i>125</i>	<i>26.3%</i>
% STEM/ TOTAL UAPB	3.0%	5.2%	5.9%	5.8%	6.4%	10.3%	10.4%	

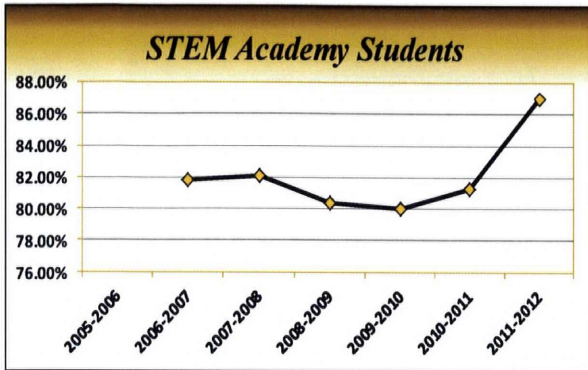




# STEM DATA



## University of Arkansas at Pine Bluff - STEM Retention Fall 2005 - Spring 2012



## Retention STEM Majors

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	60.50%	56.40%	2.86	17	56.30%	66.20%	65.20%
2006-2007	56.00%	50.50%	2.82	17	54.30%	60.40%	81.80%
2007-2008	60.00%	54.80%	2.89	17	57.00%	64.20%	82.10%
2008-2009	55.70%	46.70%	2.86	17	60.40%	69.10%	80.40%
2009-2010	54.40%	52.40%	2.77	17	63.90%	69.80%	80.00%
2010-2011	54.50%	50.80%	2.77	17	57.00%	65.00%	81.30%
2011-2012	52.30%	45.20%	3.37	21	54.60%	63.90%	87.00%

## UNDERGRADUATE DEGREES CONFERRED IN STEM DISCIPLINES BY ACADEMIC YEAR

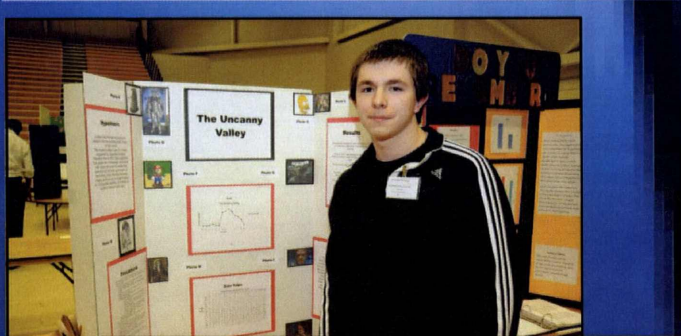
Major Group	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	% Change AY 2004-05/ AY 2010-11
Agriculture Science	19	23	30	24	19	27	13	14	-26.32%
Chemistry	2	4	1	2	3	8	5	10	400.00%
Computer Science	12	10	6	7	4	8	11	13	8.33%
Industrial Technology Management and Applied Engineering	12	26	17	22	21	15	28	31	158.33%
Biology	29	17	24	25	22	19	17	32	10.34%
Mathematics	2	1	1	2	2	2	0	2	0.00%
Physics	0	1	0	0	1	0	1	3	300.00%
<b>TOTAL - STEM</b>	<b>76</b>	<b>82</b>	<b>79</b>	<b>82</b>	<b>72</b>	<b>79</b>	<b>75</b>	<b>105</b>	<b>38.16%</b>
<b>TOTAL - UAPB (UG)</b>	<b>420</b>	<b>372</b>	<b>376</b>	<b>365</b>	<b>401</b>	<b>375</b>	<b>382</b>	<b>461</b>	<b>9.76%</b>
<b>% STEM/ TOTAL UAPB UG</b>	<b>18.10%</b>	<b>22.04%</b>	<b>21.01%</b>	<b>22.47%</b>	<b>17.96%</b>	<b>21.07%</b>	<b>19.63%</b>	<b>22.78%</b>	



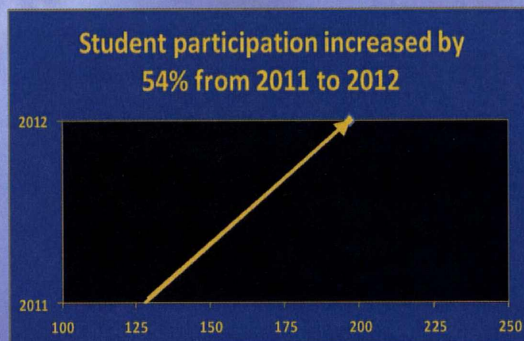
# UAPB SCIENCE FAIR EXPOSITION

The University of Arkansas at Pine Bluff (UAPB) held its *8th Annual Science Fair Exposition (Expo)* on February 16, 2012. The Expo was held in the arena of the Kenneth L. Johnson, Jr. 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. There were eighteen (18) 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
- ◆ Environmental Management
- ◆ Environmental Sciences
- ◆ Mathematical Sciences
- ◆ Medicine and Health Sciences
- ◆ Microbiology
- ◆ Physics and Astronomy
- ◆ Plant Sciences
- ◆ Social & Behavioral Sciences
- ◆ Teams



There were 197 total participants for the 2012 Science Fair and Exposition.



Thirty-four judges were recruited to evaluate the research projects and interview students in all categories at both the junior and senior high school levels.

A total of 82 students received a first, second or third place award in 17 junior division and 16 senior division categories. A total of five school districts participated in the Expo.

Special awards were presented by the Biology Club/Tau Iota Mu and the Student Affiliate chapter of the American Chemical Society.

The Overall Best of Fair was awarded by the Office of the Vice Chancellor for Academic Affairs. This year's recipient was Mr. Lawrence Chamberlain, a senior at Stuttgart High School. Mr. Chamberlain received a full academic and tuition scholarship to the University of Arkansas at Pine Bluff.



*UAPB 9th Annual Science Fair Exposition*

will be held

**February 21, 2013**

in the

**Arena of the Kenneth L. Johnson, Jr. HPER Complex**



# UNIVERSITY OF ARKANSAS AT PINE BLUFF

## STEM Saturday Academy

for

### Area High School Science and Mathematics Teachers and Students

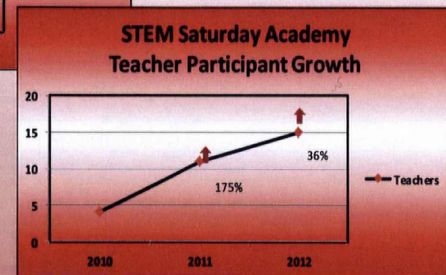
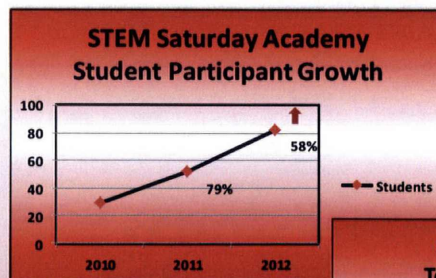
Each year a number of 10-12th grade students are selected to attend the STEM Saturday Academy where they conduct experiments in various science, technology, engineering and mathematics (STEM) areas.

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

In 2012, 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).



The HBCU-UP STEM project developed a partnership with the Little Rock School District, which increased participation for 2012 by 58% for student participants and 36% for teacher participants.



**2013 STEM Saturday Academy Dates:**



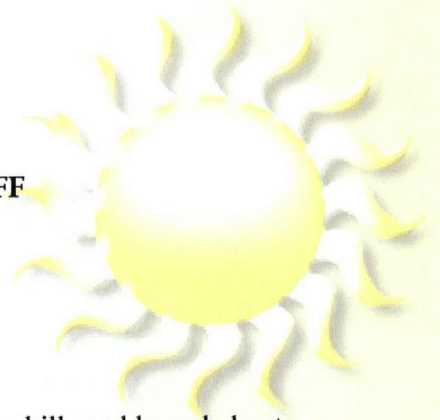
- February 2, 2013
- February 16, 2013
- February 23, 2013
- March 9, 2013

University of Arkansas at Pine Bluff



## UNIVERSITY OF ARKANSAS AT PINE BLUFF

# STEM Summer Academy



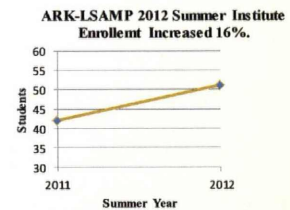
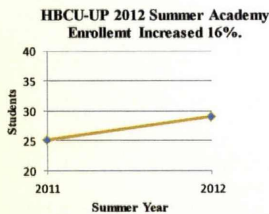
The STEM Summer Academy is a bridge program that offers the necessary skills and knowledge to pre-college high school graduates to help make a seamless transition to college. STEM Scholars receive room and board. The STEM Scholars Summer Academy is designed to enhance, enrich, and refresh the in-coming freshmen in mathematics, English, writing skills, 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-nine students in 2012. Each student received room and board for the length of the seven week period as well as a stipend for attending the Summer Academy.

### 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

**ARK-LSAMP** offered a six week Pre-First Year Summer Institute for a total of fifty-one students in 2012. Each student received room and board for the length of the six week period as well as a stipend for attending the Summer Academy. Students in the program are drawn for each of the eight colleges/universities in the 8-member alliance.



# STEM Scholars Academy



## Historically Black Colleges and Universities Undergraduate Program (HBCU-UP)

The National Science Foundation (NSF) awards HBCU-UP grants to help increase the number of minority students 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 minority students in STEM areas. The program consists of a transitional summer academy, mentoring, research internships, faculty development, equipment upgrades, curricula redesign and infrastructure enhancement.

At the STEM Scholars Academy level, 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 will 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 2.8 or higher
- ◆ Must have a composite ACT score of 19 or above
- ◆ Must complete all application requirements and forms to be submitted in the institution
- ◆ Must declare a STEM major

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

A Research and Educational Program Funded by  
**The National Science Foundation**





# STEM Scholars Academy



## 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  
Pulaski Technical College

University of Arkansas, Fayetteville  
University of Arkansas at Little Rock  
University of Arkansas at Monticello  
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 25 internships provided with four 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 2.9 or higher
- ◆ Must have a composite ACT score of 19 or above
- ◆ Must complete all application requirements and forms to be submitted in the institution prior to Fall of the school year of interest
- ◆ Must declare a STEM major at one of the Alliance Institutions

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



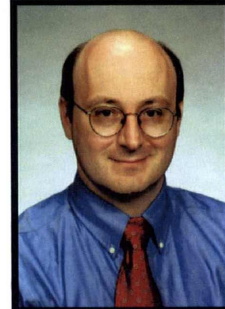
# ARKANSAS LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (ARK-LSAMP)



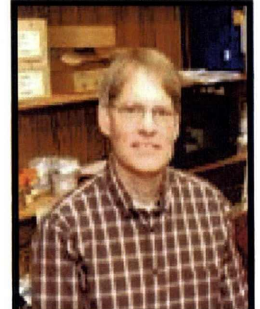
**Dr. Anissa E. Buckner**  
ARK-LSAMP Project Director



**Dr. Kaleybra Morehead**  
Southeast Arkansas College



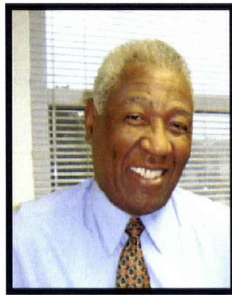
**Dr. Ben Rains**  
Pulaski Technical College



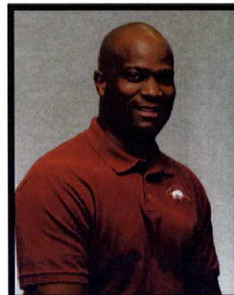
**Dr. Marvin Fawley**  
University of Arkansas at  
Monticello



**Dr. Hashim Ali**  
Arkansas State University



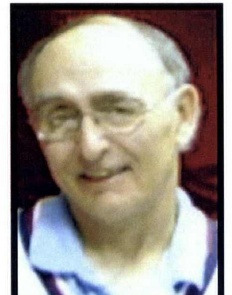
**Dr. Frank James**  
Philander Smith College



**Mr. Thomas "T.C." Carter, III**  
University of Arkansas,  
Fayetteville



**Dr. Janet Lanza**  
University of Arkansas  
at Little Rock



**Dr. Jim Winter**  
University of Arkansas  
at Little Rock

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## THE STEM ACADEMEY AND CONFERENCE CENTER

The University of Arkansas at Pine Bluff STEM Scholars Academy has outgrown the 1200 square feet of dedicated space for its STEM enrichment programs. A new building is needed to accommodate the current program along with new enrichment programs. Through a four-month planning process with Woods Architectural Group, plans have been developed for a \$8.2.M, 29,000 square foot facility devoted to academic collaboration, teaching, learning, student support, and program administration along with multidisciplinary/multifunctional research and education labs.

The new STEM Complex will be located on campus at the University of Arkansas at Pine Bluff. It will have a contemporary flair and use materials related to the existing campus architecture. The building will be a two-story complex featuring ample natural lighting and “green” building technology. Efforts will be made to utilize “green” building materials that utilize locally available materials. The emergency generators will utilize locally manufactured biodiesel fuel produced from Arkansas soy beans. The complex will have other energy saving features such as energy saving glass, automated window blinds, use of solar power, grey water recovery system and an interactive building control system to allow students to monitor use.

Dr. Calvin Johnson  
Interim Chancellor  
University of Arkansas at Pine Bluff

# THE STEM ACADEMY AND CONFERENCE CENTER

*ground breaking*

FRIDAY NOVEMBER 16 2012  
10:00 A.M.

INTERSECTION OF L.A. "Prexy" Davis Drive  
AND Watson Boulevard  
University of Arkansas at Pine Bluff™



*The construction of this building is financially supported in part by a grant from the U. S. Department of Education, Office of Postsecondary Education, Strengthening Institutions, Title III, Part B, Historically Black Colleges and Universities Program.*



# Our STEM Scholars Engage in Internship Experiences All Over the World!



## 2011-2012 Internship Sites

- |   |   |   |  |
|---|---|---|--|
| ● | <i>Ball Aerospace &amp; Technologies Corporation</i>        | ● | <i>Nationwide Children's Hospital</i>  |
| ● | <i>Boeing Corporation</i>                                   | ● | <i>Natural Resource Conservation Service</i>                                 |
| ● | <i>Booz, Allen and Hamilton</i>                             | ● | <i>North Dakota State University</i>   |
| ● | <i>Boston Specific</i>                                      | ● | <i>Oak Ridge National Laboratory</i>   |
| ● | <i>Census Bureau</i>  | ● | <i>Pine Bluff Arsenal</i>  |
| ● | <i>Cornell University</i>                                   | ● | <i>Pine Bluff School District</i>  |
| ● | <i>Dale Bumpers National Rice and Research Center</i>       | ● | <i>Research Experience for Undergraduates University of Central Arkansas</i> |
| ● | <i>Department of the Army, Joint Munitions Command</i>      | ● | <i>Research Experience for Undergraduates of Arkansas Fayetteville</i>       |
| ● | <i>Disney World</i>   | ● | <i>Rock Island Arsenal</i>   |
| ● | <i>Eaton Corporation</i>                                    | ● | <i>Texas Highway Department of Transportation</i>                            |
| ● | <i>Graduate/University of Tennessee at Knoxville</i>        | ● | <i>Tyson Foods</i>   |
| ● | <i>Genetech</i>   | ● | <i>Undergraduate Summer Science Enrichment Program UAMS</i>                  |
| ● | <i>Graduate/Florida A&amp;M University</i>                  | ● | <i>United States Steel</i>   |
| ● | <i>Graduate/General Election Aviation</i>                   | ● | <i>United Water</i>  |
| ● | <i>Graduate/Purdue University</i>                           | ● | <i>University of Alabama- Tuscaloosa</i>                                     |
| ● | <i>Graduate/University of Arkansas for Medical Sciences</i> | ● | <i>University of Arkansas at Fayetteville</i>                                |
| ● | <i>Hensel Phelps Construction, Co.</i>                      | ● | <i>University of Arkansas at Little Rock</i>                                 |
| ● | <i>Howard University</i>                                    | ● | <i>University of Arkansas at Pine Bluff</i>                                  |
| ● | <i>Iowa State University</i>                                | ● | <i>University of Arkansas for Medical Sciences</i>                           |
| ● | <i>Jackson State University</i>                             | ● | <i>University of Michigan</i>  |
| ● | <i>John Deere</i>   | ● | <i>University of North Texas Health Science Center</i>                       |
| ● | <i>John Hopkins University</i>                              | ● | <i>University of Pittsburgh</i>  |
| ● | <i>Johnson &amp; Johnson Corporation</i>                    | ● | <i>University of South Florida</i>   |
| ● | <i>Monsanto</i>   | ● | <i>URS Corporation - Washington Group</i>                                    |
| ● | <i>NASA Science Technology Institute</i>                    | ● | <i>Vanderbilt Summer Science Academy</i>                                     |
| ● | <i>National Center for Toxicological Research</i>           | ● | <i>Walmart</i>   |
| ● | <i>National Oceanic Atmospheric Administration</i>          |   |  |

# STEM SCHOLARS INTERNSHIPS



*Jasmine Washington*

Greetings! My name is Jasmine Washington. I am a sophomore at the University of Arkansas at Pine Bluff majoring in Chemistry. After completing my freshman year in college, I interned at the University of Arkansas

for Medical Sciences. The program I was involved with was Undergraduate Summer Science Enrichment Program (USSEP) under the leadership of Patricia Edgerson. During the program I was introduced to several medical students and staff members. I took the Medical College Admission Test (MCAT). Dr. Billy Thomas, M.D, Neonatologist, toured us around the Neonatal Intensive Care Unit (NICU) for pediatrics. During our visit, he told us the duties of his position along with the different machines and tubes infants are put on in cases of distress. We engaged in several hands on activities. For example, we did Cardiopulmonary Resuscitation (CPR) on a simulation mannequin "Sim". We were introduced to different tools that were used while doing CPR. We were able to take part in an intubation activity. We also participated in a neurosurgery activity. Neurosurgery was a little difficult for me, but nothing in life is going to be easy so I refused to give up. We had to take Organic Chemistry, Biology, Physics, Biochemistry and Physiology classes. We also took a class on medical terminology. During this class, we learned how to dissect medical words down to find out its actual meaning. At the end of the program, my group gave a presentation titled, "Disparities in Minorities with Depression." This program has taught me a lot as an individual who wants to pursue a career in medicine. Team work played an important role during this internship. I learned how to network, different study skills and important things to look for during medical school.

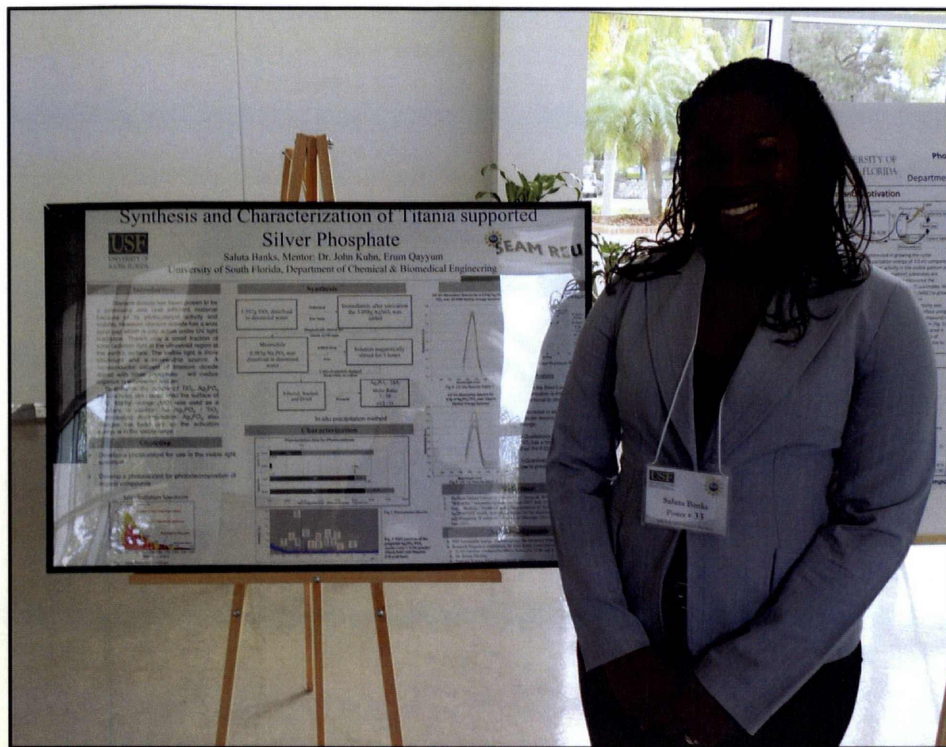


*Jarvis Randle*

I am a graduating senior majoring in Industrial Technology at the University of Arkansas at Pine Bluff. I had the privilege of working for John Deere throughout my summer internships obtained through my membership with the STEM Scholars Academy. I have interned with John Deere for three consecutive years. John Deere Company is a billion dollar franchise. They manufacture one of the world's largest selection of agriculture and construction equipment. Throughout my experience with the company, I had two different job titles; Manufacturing Engineer and Quality Engineer. As a Manufacturer Engineer, I was given three objectives which included insourcing sub-assemblies into the factory, creating a communication system between two parts of the factory, and reorganizing Operation Method Sheets (OMS) for numerous departments in the factory. My experience as a Manufacturer Engineer led to an opportunity for me to become a Quality Engineer. As a Quality Engineer, my objective was to help the company with their Product Data Management (PDM), Six Sigma and serial coding tracking system. My overall performance and experience has been outstanding. As a result of my internship experiences, I accepted an offer for a full-time position as a Quality Engineer at John Deere upon graduation.



# STEM SCHOLARS INTERNSHIPS



## *Saluta Banks*

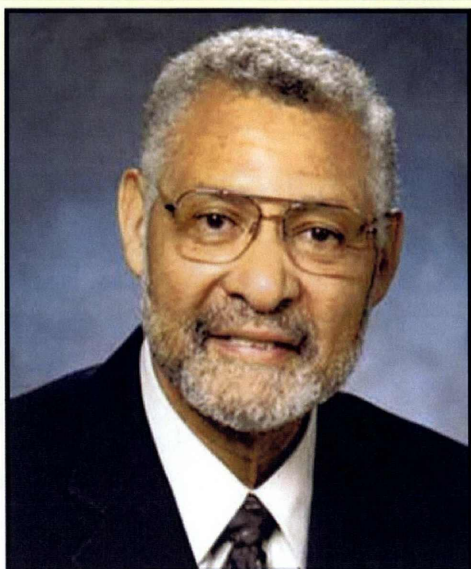
I am a senior at the University of Arkansas at Pine Bluff majoring in Chemistry. My summer internship experience was tremendous. I was one of twelve participants in the University of South Florida SEAM REU Program for Undergraduate Students. The program was held over a 10 week period and all participants were housed in graduate dorms. I was placed with a professor in the Chemical and Biomedical Engineering Department. I chose to research the Synthesis and Characterization of Titania Supported Silver Phosphate. The research we conducted involved materials that will come together and form a reaction that decomposes the pollutants in wastewater to a level

that is nontoxic and can be renewable. This research experience was challenging; however, I learned new ways to help further my education. Part of the program was to attend weekly seminars. The seminars were set to help us in areas such as applying to graduate school, applying for fellowships and taking the GRE. Also, the program provided us with field trips to Plastipak Packing Inc., NASA Kennedy Space Center, and to the University Adventure Park for team building activities. In addition, I had to write an ethics report and a ten page research paper. I also had to give an oral presentation and participate in the end of the NSF (National Science Foundation) Poster Competition, for which I was awarded second place. This summer experience overall helped me learn how to work with people on a professional level. It helped improve my time management skills and it gave me a first-hand look at what to expect in graduate school. I am glad to have had this experience before graduation and now have a better understanding of why the STEM staff encourages us, as scholars, to apply for internships and co-ops.

## *Amari Fulton*

I am a sophomore at the University of Arkansas at Pine Bluff majoring in Industrial Technology Management and Applied Engineering. My summer 2012 internship experience was a wonderful opportunity. I appreciated the opportunity to gain knowledge about the supply chain and be able to work in a corporate environment. My duties were to develop requests for proposals and quote documents. I also performed market analysis on MRO commodities and I analyzed and coded spending for Eaton Electrical Plants globally. As a result of this internship experience, I plan to enhance my knowledge of supply chains and apply for more internships and jobs relating to this field.





*Featured*

**Dr. Kennedy J. Reed**

**Physics Division**

**Lawrence Livermore National Laboratory**

Dr. Kennedy Reed is a physicist at Lawrence Livermore National Laboratory. He has produced more than 100 publications on his research in atomic collisions in high-temperature plasmas, and his work has contributed to the understanding of indirect processes in electron-impact excitation and ionization of highly charged ions.

He is a prominent leader in national efforts to increase opportunities for minority students and professionals in the sciences. He has helped develop and direct programs that have expanded research and training capabilities at minority serving institutions and enabled students to pursue advanced degrees in physical science disciplines.

Through the auspices of the International Center for Theoretical Physics in Trieste, Italy, Dr. Reed has been a visiting scientist in the West African countries of Senegal and Ghana, and through other international scientific organizations has been involved with physical science programs in numerous other African countries.

He has chaired the International Union of Pure and Applied Physics (IUPAP) Commission on Physics for Development. The IUPAP commission includes physicists from 15 countries on five continents and is mandated to help improve the conditions of physics and physicists in developing regions of the world. He also serves on the National Academy of Sciences Board on International Scientific Organizations.

Dr. Reed has received high-level recognition for his work. He is a fellow of the American Physical Society. He received the American Physical Society's John Wheatley Award for his contributions to physics research and education in Africa. The California-Nevada Section of the American Physical Society established the Kennedy Reed Award in his honor, which is presented annually to recognize the best theoretical research performed by graduate students. In 2010, President Obama awarded Dr. Reed the prestigious Presidential Award for Excellence in Science and Engineering Mentoring. In 2011 he was elected a fellow of the American Association for the Advancement of Science (AAAS) in recognition of his important studies in atomic theory, and his many successful efforts to increase minority participation in the physical sciences in the United States and Africa.

In his presentation to the UAPB STEM Scholars Academy students, Dr. Reed discussed some of his experiences working as a visiting scientist in African universities. He discussed his work directed at promoting collaborations and exchanges that connect African scientists and institutions with their counterparts in the United States.

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**PRESIDENT BARACK OBAMA AWARDED DR. KENNEDY REED  
THE 2010 PRESIDENTIAL AWARD FOR  
EXCELLENCE IN SCIENCE AND ENGINEERING MENTORING**

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**Julia Kennefick**

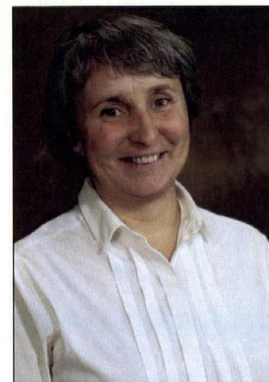
*REU in Astronomy, Space and Planetary Sciences  
University of Arkansas at Fayetteville*

Julia Kennefick from the University of Arkansas at Fayetteville came to UAPB in the Spring 2012 semester to speak with our STEM scholars about the REU in Astronomy, Space and Planetary Sciences program and the Arkansas Galaxy Evolution Survey project.

**Dr. Danielle Julie Carrier**

*Professor, Department of Biological and Agricultural Engineering  
University of Arkansas at Fayetteville*

Dr. Danielle Julie Carrier from the University of Arkansas at Fayetteville came to UAPB during the Spring 2012 semester to speak with the STEM scholars about the research programs focused on extraction of carbohydrates and phytochemicals from biomass. She also discussed research opportunities via internships with the University of Arkansas at Fayetteville.



**John Rolf**

*Unified Cross Domain Management Office  
United States Department of Defense*

Mr. John Rolf of the United States Department of Defense came to UAPB during the Spring 2012 semester to speak with the STEM scholars about the National Security Agency (NSA) hiring program, particularly in STEM areas; NSA investment in Cyber Security and Cloud/Network Computing Technology; overview of NSA operation and unique opportunities and career paths for degreed individuals.



**Henry Golatt**

*Director, Economic Research Development Center  
University of Arkansas at Pine Bluff*

Henry Golatt, director of the Economic Research and Development Center and the University of Arkansas at Pine Bluff Business Support Incubator, spoke to the STEM scholars during the Spring 2012 semester about Operation JumpStart. Operation JumpStart is a practical, hands-on, microenterprise development program designed to help entrepreneurs test the feasibility of their business ideas and plan to launch new ventures.



**Kristen Sterba, Ph.D.**

*Assistant Dean, Office of Graduate Student  
Recruiting and Retention, Graduate School, UAMS*

Dr. Sterba came to UAPB to speak to the STEM scholars during the Fall 2012 Guest Lecture Series. She has been recruiting graduate students to UAMS since 2003. She is also responsible for coordinating various Graduate School events and is Co-Director of the Scientific Communications and Ethics course for first year basic science students. In her role as Assistant Director of the new NIH funded UAMS Initiative for Maximizing Student Diversity program, Dr. Sterba aims to increase the number of underrepresented minority students receiving doctoral degrees in the biomedical sciences.



## 2012 CONFERENCES AND ACTIVITIES

**2012 Women of Color 16th Annual STEM Conference in Dallas, TX** Juanita Anthony of Computer Science, Felicia Webb of Industrial Technology Management and Applied Engineering, and Janee' Adams of Chemistry accompanied eight STEM students (Rhyanna Cohen-Computer Science Major, Kayla Wright-Computer Science Major, Kendyl Washington -Mathematics Major, Delois Moss-Chemistry Major, Kymberly Wimberly-Chemistry Major, Breanna Crews-Industrial Technology Major, Shaneeka Hawkins-Industrial Technology Major, and Fabiola Cardosa-Industrial Technology Major) to the 2012 Women of Color Conference held in Dallas, TX in October 2012.

*"When I first attended the Woman of Color Conference last year, I didn't know what to expect. That experience created a desire for me to improve my networking techniques so that I can take advantage of every opportunity to secure my future. This year I am looking forward to attending the different workshops available and networking with the various schools and employers that will be at the conference."*

**-Kendyl Washington**



## **The National Society of Black Engineers 38th Annual Convention in Pittsburg, PA**

Dr. Charles Colen, Co-Principal Investigator, O.C. Duffy of Industrial Technology, Juanita Anthony of Computer Science and Tracy Knowlton of Career Services, along with 26 STEM students attended the National Society of Black Engineers (NSBE) 38th Annual Convention in Pittsburg, PA on March 27-April 1, 2012. NSBE, with more than 35,700 members, is one of the largest student-governed organizations in the country. Founded in 1975, it includes more than 394 chapters in the United States and abroad. NSBE's mission is 'to increase the number of culturally responsible black engineers who excel academically, succeed professionally and positively impact the community. The annual convention attracts more than 9,000 Black engineers and 300 corporate and government entities, including each of the arms of the military. Eight students received internships during their attendance at the conference. Seven students received employment offers.



## 2012 CONFERENCES AND ACTIVITIES

### Emerging Researchers National (ERN) Conference in STEM in Atlanta, GA

The Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathematics (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 Resource Development (HRD), within the Directorate for Education and Human Resources (EHR). The objectives of the conference are to help undergraduate and graduate students enhance their science communication skills and to better understand how to prepare for science careers in a global workforce.



Dr. Mary Benjamin, Dr. Anissa Buckner and Dr. Antonie Rice along with 15 STEM scholars from UAPB attended the Emerging Researchers National (ERN) Conference in STEM in Atlanta, GA on February 23-25, 2012. The Emerging Researchers National (ERN) Conference in Science, Technology, Engineering and Mathematics (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 Resource Development (HRD), within the Directorate for Education and Human Resources (EHR). The objectives of the conference are to help undergraduate and graduate students enhance their science communication skills and to better understand how to prepare for science careers in a global workforce.

*Mr. Jarren Oates, a UAPB ARK-LSAMP STEM Scholar, won a first place award for his oral presentation on Systemic Lupus Erythematosus at the conference.*

### The C.A. Vines Arkansas 4-H Center in Little Rock, AR.

Eighty new 2012 STEM Scholars Summer Institute/Academy student participants and mentors travelled to the C.A. Vines Arkansas 4-H Center on June 20, 2012 for an afternoon of team-building exercises. The students were divided into three random groups. Each group participated in team building exercises that focused on trust, brainstorming, problem-solving, cause and effect. Overall, the 4-H center activities helped to unite HBCU-UP and ARK-LSAMP students under one umbrella; the STEM Scholars Academy.



# STEM Scholars Academy Graduates

The University of Arkansas at Pine Bluff has conferred a total of 650 degrees to STEM majors from academic year 2003-2004 to academic year 2011-2012. The first cohort of STEM Scholars enrolled at the University of Arkansas at Pine Bluff in the Fall of 2004 semester. At the end of the 2003-2004 academic year, The university had conferred 55 STEM undergraduate degrees. In the 2011-2012 academic year a total of 105 degrees were conferred to STEM students. This indicates an increase of 90% in the number of graduates within STEM majors.



## FALL 2011 GRADUATES

Ibrahim Abdulai	<i>Chemistry</i>
Jennifer Caldwell	<i>Chemistry</i>
Isaac Clark	<i>Industrial Technology</i>
Debie Dunn	<i>Industrial Technology</i>
Sherice Flowers	<i>Mathematics</i>
Tracy House	<i>Industrial Technology</i>
Brandon Hubbard	<i>Industrial Technology</i>
Jasmine Jacobs	<i>Biology</i>
Larry Kirklin	<i>Biology</i>
Barry McDonley, Jr.	<i>Industrial Technology</i>
Kye Meadows	<i>Industrial Technology</i>
Candace Shelton	<i>Chemistry</i>
LaQuisha Slaton	<i>Biology</i>
Allen Smith	<i>Industrial Technology</i>
Lucenta Toney	<i>Industrial Technology</i>
Avery Wheeler	<i>Industrial Technology</i>

## SPRING 2012 GRADUATES

Ledarius Anthony	<i>Computer Science</i>
Adrian Beard	<i>Physics</i>
Jennifer Caldwell	<i>Physics</i>
Keisha Cawley	<i>Biology</i>

## SPRING 2012 GRADUATES (con't)

Pearl Clark	<i>Computer Science</i>
Camille Cooper	<i>Chemistry</i>
Sharon Dobbs	<i>Computer Science</i>
Keisharra Eldridge	<i>Chemistry</i>
Bryan Ellis	<i>Biology</i>
Remo Gay	<i>Industrial Technology</i>
Spencer Goodwin	<i>Industrial Technology</i>
Laswanique Gray	<i>Biology</i>
Armetra Green	<i>Mathematics</i>
Adrienne Hatchett	<i>Biology</i>
Devin Heggie	<i>Biology</i>
Jillian Howard	<i>Industrial Technology</i>
Michael Johnson	<i>Industrial Technology</i>
Kandice Lee	<i>Chemistry</i>
Brennon Luster	<i>Biology</i>
Stephen McElwee	<i>Computer Science</i>
Karmen Moore	<i>Biology</i>
Anthony Polk	<i>Industrial Technology</i>
Ashley Rich	<i>Biology</i>
Phyllisia Sims	<i>Chemistry</i>
Kierra Smith	<i>Computer Science</i>
Marcus Toney	<i>Industrial Technology</i>



# 2011-2012 STEM SCHOLAR GRADUATES



**Ibrahim Abdulai**  
*Chemistry*



**Adrian Beard**  
*Physics*



**Jennifer Caldwell**  
*Physics*



**Camille Cooper**  
*Chemistry*



**Sharon Dobbs**  
*Computer Science*



**Sherice Flowers**  
*Mathematics*



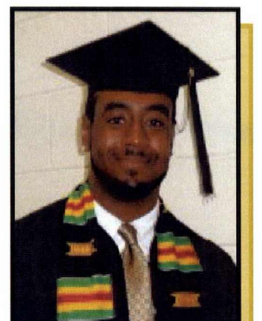
**Adrienne Hatchett**  
*Biology*



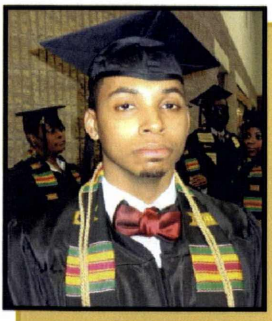
**Tracy House**  
*Industrial Technology*



**Jasmine Jacobs**  
*Biology*



**Michael Johnson**  
*Industrial Technology*



**Barry McDonely, Jr.**  
*Industrial Technology*



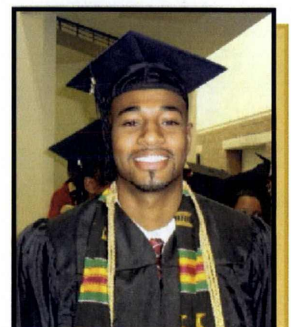
2011-2012



**LaQuisha Slaton**  
*Biology*



**Lucunta Toney**  
*Industrial Technology*



**Avery Wheeler**  
*Industrial Technology*



## UNIVERSITY OF ARKANSAS AT PINE BLUFF 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 masters degree in Computer Science and Technology and \$1.5M for construction of the STEM Academy and Conference Center.

### **Graduate Science Enrichment Program. Graduate Assistants (full time or part time)**

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, assisting with formal presentation, and assisting in laboratories and other mathematics/science related activities.

### **Qualifications**

1. Bachelor's degree in mathematics or mathematics education, science or science education, business technology education, or computer science (computer information systems or technology) or bachelor's degree with 30 hours 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).

*Students may apply for full-time or part-time assistantships.*



## Acknowledgements

The UAPB STEM Academy expresses deep appreciation to all who contribute to its successful outcomes.

Special appreciation is extended to our funding agencies:

- ◆ **The National Science Foundation**
- ◆ **The U.S. Department of Education**
- ◆ **The Arkansas Science and Technology Authority**
- ◆ **The University of Arkansas at Pine Bluff**
- ◆ **Title III Program (funded through the U.S. Department of Education, Office of Post Secondary Education, Institutional Services)**

All donors are deeply appreciated.

- Mary E. Benjamin, Principal Investigator

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Research Project Analyst  
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## Internal Advisory Board

- Mr. Sharok Abedi, *Instructor*, Department of Mathematical Sciences and Technology
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