

**Kentucky-West Virginia
Louis Stokes Alliance for
Minority Participation**

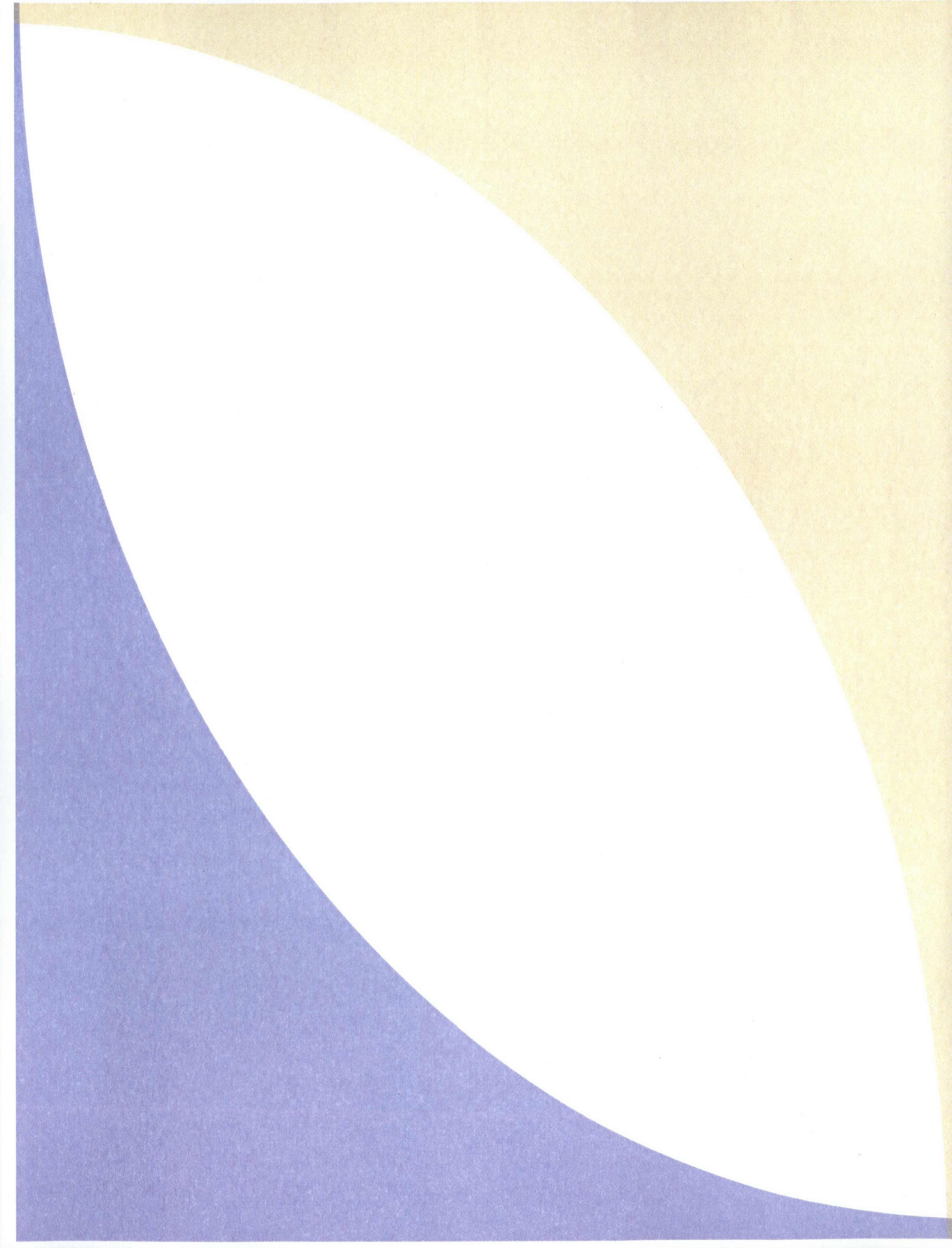
Impact Report



National Science Foundation

Grant Number HRD-0603091





Kentucky-West Virginia AMP Institutions:

Bluegrass Community & Technical College
Charlene Walker
Vice President for Multicultural Affairs
(859) 246-6438

Centre College
J. Preston Miles, PhD.
(859) 238-5414

Kentucky State University
T.S. Kochhar, PhD
Professor of Biology/Fulbright Senior
Specialist
(502) 597-6070

Marshall University
Shari J. Clark, Ph. D.
Multicultural Affairs
(304) 696-4676

University of Kentucky
Dr. Ingrid St. Omer
Assistant Professor
Electrical & Computer Engineering
(859) 257-6143

University of Kentucky
Jeffrey L. Osborn, PhD
Co-Campus Coordinator & Professor
Biology & Science Outreach-AMSP
(859) 257-3988

University of Louisville
Pamela Feldhoff
Associate Professor- Bio Chemistry/Molecu-
lar Biology
Associate Vice President Research
(502) 852-7136

West Virginia State University
Dr. Ami Smith, Program Leader for CASTEM
(304) 766-5701

Kanawha Valley Community
& Technical College
(WVSCTC)
Dr. Ami Smith, Program Leader for CASTEM
(304) 766-5701

West Virginia University
David Miller, PhD.
Assistant Professor, Mathematics
Department of Mathematics
(304) 293-2011, x2323

Western Kentucky University
Dr. Charles H. McGruder, III
William McCormack Professor of Physics
Department of Physics and Astronomy
(270) 745-5277

Report Authors and Contributors:

Authors: Michael Lee, Executive Director, KY-WV LSAMP; Dr. John Yopp, Co-PI; Jennifer Hart; JoBeth Jordan
Contributors: KY-WV LSAMP Campus Coordinators and Dorothy Ferguson

Published by the Kentucky-West Virginia Louis Stokes Alliance for Minority Participation, September 2011.

Copyright © 2011; University of Kentucky, Lexington, KY
All rights reserved. Not to be reproduced without permission.

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation Impact Report 2006 - 2011

Table of Contents:

History.....	1
Significant Impacts.....	2
Key Programs.....	3
Research Symposium and Research Mentorship.....	3
Recruitment and Retention.....	5
Curriculum Development.....	5
Mentoring and Advising Centers.....	6
Bridge Programs.....	7
STEM Clubs and Unique Opportunities.....	8
Administrative Support, Leadership and Institutionalization.....	9
of the KY-WV LSAMP	
Facilitating Transfer.....	10
Future Directions and Presidential Partner Support.....	11
Economic Impact.....	12
Alliance Campus Coordinators.....	14
Student Successes.....	16
Program Outcomes.....	18

Any opinion, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

This material was developed under Grant HRD-0603091

History

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation (KY-WV LSAMP) is one of 45 National Science Foundation Alliances for Minority Participation in the nation. Established in 2006 as an alliance of six institutions in Kentucky and four in West Virginia, it influences the lives and education potential of both states' traditionally underrepresented minority students interested in careers in science, technology, engineering, and mathematics (STEM).

The traditionally underrepresented minority students targeted by the national LSAMP program (African-American, Hispanic, American Indians, and Pacific Islanders) represent an almost unique recruitment challenge for the KY-WV LSAMP institutions because of their unusually low percentages of the populations of the two states. Even though this underrepresented minority population accounted for over 25% of the U.S. Population in the 2000 census, they comprise only 9% and 4.1% of the population in Kentucky and West Virginia, respectively.

The principal goals of the KY-WV LSAMP are to increase the quantity and quality of students from these underrepresented groups earning baccalaureate degrees in STEM disciplines and providing the knowledge and opportunities for continuing into a STEM-related graduate program or direct entry into the STEM workforce.

Recognizing the diversity of student preference in type of higher education institution to attend, the LSAMP's institutions vary in size, setting (rural versus urban), programmatic and mission focus, student demographics, and degree of research emphasis. They are the University of Kentucky (lead institution), Kentucky State University (HBCU), Centre College, University of Louisville, Western Kentucky University, and Bluegrass Community and Technical College in Kentucky. In West Virginia, they are West Virginia University, West Virginia State University (HBCU), Marshall University, and Kanawha Community and Technical College.

The focus areas chosen for the strategies to meet the overall goals are: recruitment and retention, re-

search experiences, transitional experiences, campus climate enhancement, curriculum reform, postgraduate career aspirations and role models. The different missions of the alliance partners provided the basis for different emphases in leadership and strategies for each of the focus areas.

One of the most successful alliance-wide programs is the annual KY-WV LSAMP Student Research Symposium. A talented group of STEM faculty members mentor students in high-level research projects which are presented orally and in posters and evaluated by STEM faculty experts. Due to the recognition they receive, many students go on to present in other venues and have earned national recognition for achievement as a result of this program. The symposium also features national STEM role models as speakers who interact with the LSAMP students during the sessions.

Transfer programs and centers have been created or utilized to facilitate pathways from two-year to four-year partner institutions. Curricular reforms have been instituted as exemplified by the Emerging Scholars Program (ESP) for Calculus. These are models for institutionalization throughout the Alliance. The KY-WV LSAMP has been a catalyst for developing relationships with a wide array of stakeholders that include the Kentucky and West Virginia NSF EPSCoR programs, Kentucky Council on Postsecondary Education, West Virginia Higher Education Policy Commission, Coca Cola Corporation, Toyota Kentucky, Muhammad Ali Museum, Federal Bureau of Investigation, Kentucky Corp of Engineers, Kentucky Rural Elective, the National College Board, Met Life Insurance, and even the Cincinnati Bengals Football Enterprise, a sponsor of a unique program to build STEM student pipelines.

The Alliance's work in enhancing campus climate and creating an infrastructure conducive to fostering minority participation in STEM education has increased the visibility of the Alliance's programs on their respective campuses. Several institutions have been able to leverage this visibility to garner financial support from their home institutions for their programs. These are harbingers of a bright future for the incoming students and a maturing Alliance.

Significant Impacts

As an initial level Alliance, the KY-WV LSAMP has progressively established relationships with each state higher education coordinating board and its principal partners including the KY and WV Experimental Program to Stimulate Competitive Research (EPSCoR) of the National Science Foundation (NSF). For the first two years, each Alliance partner campus developed intra-institutional programs consistent with its specific mission goals, and organizational structure. However, the past three years have witnessed increasing Alliance wide and state wide programs visible to the principal educational stakeholders.

Alliance-wide Initiatives

Believing in the importance of STEM faculty-mentored undergraduate research to the development of STEM-related graduate level educational aspirations and careers, the KY-WV LSAMP campus coordinators created the annual **KY-WV LSAMP Annual Student Research Symposium**. Each symposium features oral and poster presentations of participant student research and presentations and student interactions of nationally known speakers, serving as role models for STEM careers. The student presentations are attended by representatives from the higher education coordinating boards and the other KY-WV LSAMP partners. The Alliance institutions' STEM faculty evaluate and judge the presentations and awards are given to the top student researchers. Many of the students take their research presentations to other conferences and special meetings (e.g. Legislature Demonstration Day in Washington, D.C. and professional societies).

The KY-WV LSAMP is a unit member of the state and Appalachian-wide **Partnership Institute for Mathematics and Science Education Reform** (PIMSER, www.uky.edu/PIMSER). Within a year of its formation, the KY-WV LSAMP joined PIMSER as an autonomous unit member with six other STEM-education outreach units (see PIMSER organizational chart on website). This provides state and Appalachian-wide visibility for the Alliance programs and activities. The KY-WV LSAMP also benefits through the assistance given by PIMSER's

central core staff at the University of Kentucky and association with other NSF supported programs like AMSTEMM and the Appalachian Math and Science Partnership (AMSP).

The inclusion of the **Kentucky Council on Post-Secondary Education** (CPE) and the **Higher Education Board of West Virginia** as KY-WV LSAMP partners gives it statewide visibility and recognition. Both higher education associations are represented in LSAMP Executive Committee and Board of Governors (all Alliance partner Presidents) meetings. This has allowed the KY-WV LSAMP to be represented in the statewide portfolios of STEM education reform initiatives. This was a significant addition to the respective states' initiatives to promote diversity in STEM education.



West Virginia University Research Experience for Undergraduates (REU) students.

Key Programs

Research Symposium and Research Mentorship

The KY-WV LSAMP Annual Student Research Symposium has been described in general in the section on Significant Impacts. A few highlights of past and current year symposia illustrate the function of the annual event in binding young LSAMP research students from the Alliance's ten institutional members in the two states.

The Fourth Annual KY-WV LSAMP Student Research Symposium, "Preparing the Next Generation for Careers and Opportunities in STEM" was last held in April 2010 at the Hilton Lexington Downtown. Participants were treated to several guest speakers most notably: Michael Crutcher (a historical presentation entitled The Spirit of Frederick Douglas), Dr. Vahid Majihi (FBI-Weapons of Mass Destruction expert), Dr. Jennifer McIntosh (West Virginia University – President's Office of Social Justice), John Falconer (Muhammad Ali Center) and Dr. Howard Adams (Howard Adams & Associates) Dr. Adams is known as The Godfather of Mentoring programs and the Founding Director (Emeritus) of the GEM program. Dr. Adams' talk was entitled, "Get Up With Something On Your Mind." There were several concurrent workshops during the 1 ½ day symposium which included an employer panel with representatives from E.ON, the Office of Surface and Mining, and Ronald Jones of Marshall University's Dare II Lead program who conducted a workshop advising students about the pitfalls of procrastination, and the utility of being mindful about accountability, motivation, encouragement, and dedication at all times. The 2010 symposium, offered four oral presentations and eight poster presentations. Student presenters included - Rachel Hayden, Kentucky State University (Biology), Loretta Kwan, University of Kentucky (Mechanical Engineering), Jahi Palmer, Western Kentucky University (Physics), Brittany Obi, University of Kentucky (Agricultural Biotechnology), Virgil Barnard, Kentucky State University (Biology), Richard Jones, University of Kentucky (Electrical Engineering), Consolee Karangwa, University of Kentucky (Biology), Shanae Kincannon, Kentucky State University (Biology), Alysha Lewis, University of Kentucky (Agricultural Biotechnology), Joseph Wilkins, University of Louisville (Atmospheric Science). The 2011 symposium will be held October 6-7 at Mountain-



*KSU-LSAMP student Kyla Ross flanked by KSU President Sias and T.S. Kochhar, Ph.D., KSU-LSAMP Coordinator
lair Student Union at West Virginia University.*

The KY-WV LSAMP Research Symposium draws its student participation from faculty mentored student researchers at the individual Alliances campuses. Many of these LSAMP student go on to make presentations at national meetings where they have earned awards and honors. Some significant examples are given to illustrate this point.

Kentucky State University (KSU), the only HBCU in the commonwealth of Kentucky, is committed to increasing undergraduate enrollment leading to Bachelor's degree in STEM disciplines. The presence of the LSAMP program over the last five years definitely has had a positive impact on this commitment. The following activities contributed to the impact:

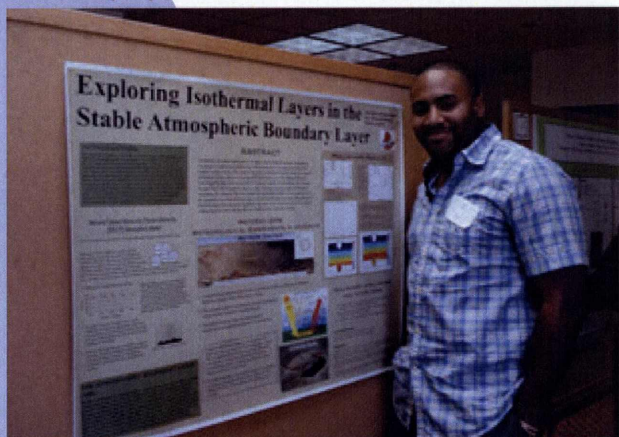
Research participation at the undergraduate level is critical for transition to and success at graduate schools and in obtaining of terminal degrees in STEM areas. Since the inception of the LSAMP program at KSU, fifteen Science & Math majors have participated in undergraduate research under different faculty and land grant research mentors. This has resulted in more than thirty presentations in the area of agricultural sciences, biology, and mathematics made at various professional society meetings (including two first place awards) and three research publications in peer-reviewed journals with LSAMP students as co-authors. As a result of this LSAMP-sponsored lab experience, two participants were selected for extramural summer research at Cornell University and the University of Kentucky. Seven research students have already graduated with a bachelor's degree and four are in graduate school (3 in sciences and one in

business). Two, at present, are applying for MD/PHD program. Two students have transferred and the rest are still in school.

Support to Attend Professional Meeting: In 2008 the program supported 10 STEM students to attend NSBE annual conference in Orlando, FL. Several of these students were honored at the conference. For instance, Mackendy Alcinvil, an information technology major, was named the 2008 GE African American Forum Scholar. Another computer science major, Sabrina Anderson, placed third for the Mike Shinn NSBE Distinguished Member of the Year Award. This award is given to student members who demonstrate high scholastic performance, dedicated service to society and other organizations and possess high professional promise.

The University of Louisville (UofL) has developed a University-wide Undergraduate Research Symposium that will feature presentations by LSAMP students.

Support for undergraduate research targeted to underserved, underrepresented and/or vulnerable populations at UofL is through their CODRE program of the Office of the Vice President for Research. This research experience that includes LSAMP students is the basis for presentations in the Undergraduate Research Symposium.



Joseph Wilkins, University of Louisville student, with his poster presentation, "Exploring Isothermal Layers in the Stable Atmospheric Boundary Layer".

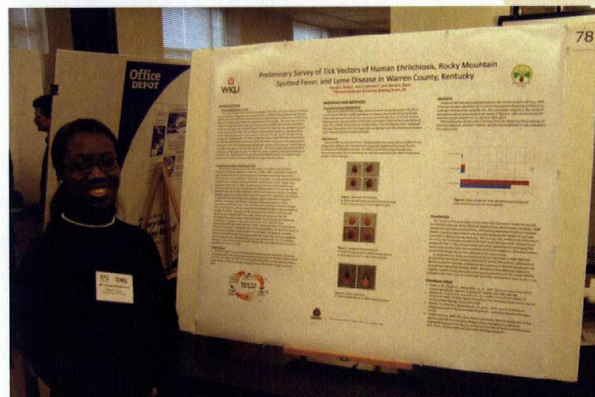
The University of Kentucky has sent its LSAMP students to conferences throughout the Alliance's formative years. These include the following:

- National Organization for the Professional Advancement of Black Chemists and Chemical Engineers National Conference
- American Indian Science and Engineering Society

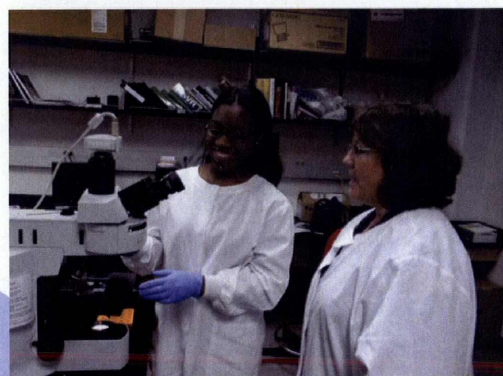
(AISES)

- Annual Biomedical Research Conference for Minority Students (ABRCMS)
- National Conference on Undergraduate Research (NCUR)
- Emerging Researchers National Conference in STEM
- LSAMP 2010 JAM Poster Session (Posters-on-the-Hill)
- UK Showcase of Undergraduate Scholars
- 2010 Women of Color (WOC) STEM Conference
- Special National LSAMP Program Capitol Hill Demonstration to Legislators 2010
- International Conference on Advances in Geotechnical Engineering 2011

Western Kentucky University's (WKU) "Focus Area" for this initial level LSAMP was undergraduate student research experiences. KY-WV LSAMP funds were used to fund eligible undergraduate student participants to engage in STEM faculty-mentored research projects. WKU's student competitors in the annual undergraduate research symposium won first prize in 2009 and 2010. As the pictures below illustrate, these student research projects were not only award winners but were relevant to rural Kentucky.



Cheryl Onwu, WSU student, presenting her paper "Preliminary Survey of Tick Vectors of Human Ehrlichiosis, Rocky Mountain Spotted Fever, and Lyme Disease in Warren County, KY".



Cheryl Onwu studies tick-borne pathogens in south central Kentucky.

West Virginia University's faculty-mentored research programs include the REU (Research Experience for Undergraduates) and SURE (Summer Undergraduate Research Experience). In both programs LSAMP students work one-on-one on research projects with STEM faculty.

Centre College has integrated its LSAMP students into its comprehensive summer collaborative research program that included 45 students and 25 STEM faculties in 2010. As a result of participation in Centre's LSAMP program of 17 Level-1 participants, four student research presentations have gone beyond the LSAMP annual symposium to for presentations at regional and national meetings.

Recruitment and Retention

All of the Alliance campus coordinators engage in recruitment and the Summer Bridge Programs (see below) are a major program activity with this as a principal goal. Several Alliance partner institutions have developed targeted recruitment programs that enjoy an increasing measure of success. The **University of Louisville** has two of these model programs.

The first, "STEMulating Emerging Minds", targets high school juniors and seniors interested in STEM disciplines. The second one is "The STEM College" which was created to enhance STEM awareness and provide a knowledge base for the required STEM courses by major. The LSAMP students recruited into the "college" engage in a holistic educational and academic co-curricular experience emphasizing the principle that STEM disciplines are not an isolated entity but an essential part of 21st century education for an informed citizenry.

Likewise, UofL has a second related program of emphasis, **retention**. Freshmen and sophomores in the "LSAMP Scholars Program" receive academic support for STEM courses that present the greatest challenge to earning a passing grade. Peer mentors from the STEM disciplines are selected for tutoring. The retention program also has requirements for community engagement and leadership training. For juniors and seniors, the LSAMP Scholars Program focuses on providing students information and support to apply for research opportunities and summer internships. Job hunting skills such

as resume writing and interviewing techniques are also offered. In 2010-2011, membership in this program increased to 55 students. A recent highlight of the LSAMP Scholars Program was a visit to GE Appliance Park to witness "STEM in Practice."

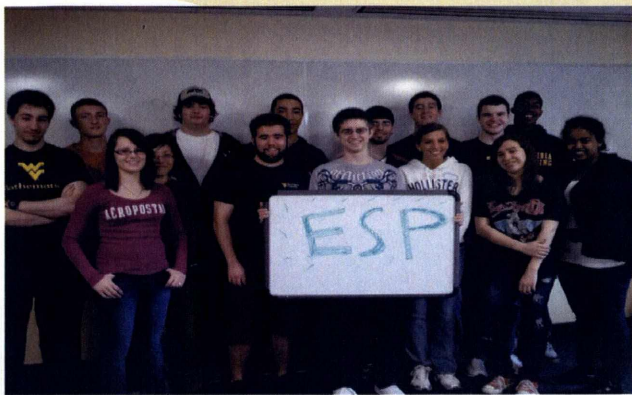
Another model recruitment and retention program is that of **Kentucky State University**. The presence of LSAMP on its campus prompted them to establish "Recruitment and Retention Committees in the Division of Math and Science" in 2009-10. The essential features of the Recruitment Committee are a Facebook site for the STEM disciplines, comments from KSU STEM graduates to distribute to LSAMP STEM undergraduates, and talks by the Divisional faculty on STEM topics of popular interest to high schools in KSU's service area.

The Retention Committee functions by holding All-Majors Meetings to disseminate information about advising, on-campus clubs, scholarships, and research opportunities and by updating the STEM Community on Blackboard for continuous communication of relevant information.

Curriculum Development

While all of the LSAMP partner institutions are improving courses and curricula in the STEM disciplines, the following are some noteworthy examples led by campus coordinators in the Alliance:

West Virginia University-Emerging Scholars Program (ESP) for Calculus: The Mathematics Department and the WVU-LSAMP offers a special section of Calculus modeled after the successful Emerging Scholars Program (ESP). ESP was started in the late 1970's at University California-Berkeley by Dr. Uri Triessman and has been adopted at about 100 Universities in the U.S.. The ESP Calculus class focuses on student collaborative learning. After minimal time spent in a lecture format, the class participants move to an environment in which groups of students work on problems, compare, and present answers. This collaboration among students stimulates additional interactions and more thinking about course content. Workshop problems are based on the material covered in lecture. They are designed to challenge each student's ability. Students spend most of the workshop time collaborating in groups, grappling with difficult ideas and problems. This active learning approach produces a thorough understanding of the concepts and an unusual level of creativity. ESP students more often than not perform better in their subsequent courses,



ESP Students (ESP Calculus II)

gain a better understanding of calculus, and form personal, long lasting friendships with other participants. Initially, five students were enrolled in the ESP class. Recruiting efforts this fall increased the participants to include over 15 students in the ESP Calculus class. Activity Goals and Objectives: The goal of the activity is to equip these students with the necessary skills in calculus and problem solving to be successful in their STEM major. ESP actively involves the students in learning calculus while developing a cohort of STEM majors who matriculate through other STEM courses, and support each other as they continue to pursue their STEM degrees. Activity Outcomes: The students earned passing grades in Calculus and many continue with ESP in Calculus II. These students are supported throughout their LSAMP participation to facilitate the important academic integration. Results have been outstanding. Seven out of 10 LSAMP students in Calculus I and 7 out of 9 in Calculus II have earned As or Bs and the students' evaluations have been superb. The student rating of the class was 4.85 of 5.0 overall. In this current year, past ESP students have served as peer mentors for the class. The ESP course has been highlighted in Alliance wide presentations (2011).

Another example of an LSAMP developed special course tract shown to other Alliance partners is the annual LSAMP Seminar course developed by the University of Kentucky campus coordinator, Dr. Ingrid St. Omer. It includes lectures by five outstanding STEM scholars and topics such as "career options in STEM," "writing a scientific paper," "effective study habits," "who are your mentors," "budgets and finance," "political networking," "etiquette dinner," notable scientists and engineers," and "presentation skills."

Mentoring and Advising Centers

All of the KY-WV Alliance institutions provide extensive undergraduate student mentoring and tutoring programs. Some have been developed to the degree that allow them to be considered best practices.

The **University of Kentucky** provides tutoring services for LSAMP students in STEM courses in a specially designed room known as the "Knowledge Café (a drop-in center). The Center provides LSAMP students laptop computers, printers, study-guides, calculators, and special writing boards for group instruction.

West Virginia University has provided tutors for the difficult STEM courses for its LSAMP students since 2007.

Bluegrass Community and Technical College (BCTC) has a number of LSAMP associated advising and mentoring programs. These number among the most extensively developed community college STEM student advising/mentoring programs in the Alliance. They include:

BCTC-LSAMP College Experience Camp, College Experience Days, and the Multicultural College Day expose students to college preparedness courses, scholarship workshops and other opportunities, the students attending these events have exposure to Kentucky public and private universities and colleges and receive College Preparation Kits. They are also exposed to career oriented information that highlights prominent Hispanic/Latinos and other burgeoning populations in different STEM and technical fields. The objectives are to increase knowledge about postsecondary opportunities among students and families from populations with low college-going rates.

The BCTC-LSAMP College Experience Camp is a week-long intensive college preparation program that allows current high school students to learn and experience college processes such as application, enrollment, registration, orientation, testing, advising, and classes. The students attended classes taught by professors from BCTC, UK, Eastern Kentucky University (EKU), WKU, Transylvania University and other schools, as well as Spanish-speaking/ Latino professionals and leaders that make Kentucky their home.

BCTC-LSAMP College Experience Days are designed for students to visit the college campus, observe college level courses, take a comprehensive tour-highlighting academic and student support services, and participate in a goal setting/career exploration exercises. BCTC-LSAMP college students serve as ambassadors by taking the students to class with them and leading the tours of the campus. The College Experience Days are held on Bluegrass Community & Technical College's several campuses. The smaller campuses allow for hands-on activities such as Student Success Scavenger Hunts and tours of specific academic labs including nursing, chemistry, biology, astronomy, auto body and much more.

The **BCTC-LSAMP** and the Latino/Multicultural College Fair allows students to meet college representatives from all Kentucky public and private colleges and universities as well as other colleges and universities located in the southeast and central regions of the country. In addition, students are able to attend workshops on financial aid, scholarships, leadership, transitioning to college, and motivation. Cultural displays of Latino American history and performances are an important part of the fair. Students also were able to sit down with mentors to complete the "Mi Camino a la Universidad/ My Road to College Guide."

BCTC ACTIVITIES CAMPUS CLIMATE and TRANSITIONAL EXPERIENCES for College Students - LSAMP Scholar (Level-One)

BCTC has 45 LSAMP Level-One students who have received academic support. Tutoring is made available to all students and specialized tutoring is available when requested. Some of the Level-One students serve as peer-tutors for other LSAMP students and other students involved in STEM. Additionally, all BCTC-LSAMP students in good standing receive book stipends as a financial incentive. BCTC-LSAMP participants who adhere to all of the program stipulations (e.g. participation in cultural programming, tutoring, mentor roles with transfer center and LSAMP club membership) are considered in good standing and receive an additional \$500.00.

It is believed that BCTC's programs could serve as best practice role models for all community and technical colleges in the area of STEM awareness and preparation.

Bridge Programs

Perhaps the KY-WV LSAMP's premier bridge program that "reaches across" several of the Alliance's partner institutions is the **C.A.R.N.E.G.I.E. H.A.L.L.** This initiative is KY-WV LSAMP's best demonstration of all of the elements of the collaborative interactions expected in an alliance.

Bluegrass Community and Technical College leads this activity and collaborates with several institutions including **West Virginia University**, Georgetown College, and Transylvania University. The project also enjoys a unique partnership with the NFL's Cincinnati Bengals Football Organization who supported the program in its first year. The primary goal of CARNEGIE HALL is to broaden participation in Science, Technology, Engineering, and Mathematics (STEM) from high school students of the LSAMP targeted populations. The program seeks to increase students' STEM knowledge prior to entering college, thereby leading to the production of more STEM undergraduates, and further exploration and selection of STEM careers. The CARNEGIE HALL project is a year-long effort comprised of a one-week Science, Technology, Engineering and Mathematics (STEM) immersion summer camp, continuing monthly in after school sessions. The program's objective is to create first class scientists, technicians, engineers, and mathematicians from the LSAMP target populations who are middle range educational performers. This is accomplished through intense concentration on preparation, and real-time research by student scholars and their mentors. Research suggests that students completing academic immersion summer and/or after school programs dramatically improve their grades and standardized test scores. Thirty-three high school students (rising juniors and seniors) were recruited from both Kentucky and West Virginia who fit the KY-WV LSAMP target demographic. For the first time the "CARNEGIE HALL" was a joint effort between two KY-WV LSAMP schools and West Virginia University's Department of Mathematics. The program provided instruction and developed skills in leadership and team building, while promoting a STEM focus. The students were exposed to the following STEM disciplines: Forensics, Chemistry, Physics, Astronomy, Engineering, and Biology. Some of the activities in which the students participated included a tour of WVU's crime scene houses and

demonstrations in the biometrics department. The group also works with the College of Engineering's Baja car, a project through the Mechanical and Aerospace Engineering Departments, in which students used engineering principles to design an all-terrain vehicle. The students received presentations from personnel at NASA, and a representative from the FBI. The program participants enjoyed demonstrations in plasma physics, organic chemistry, and various other sciences. The students also developed Mission Statements, and learned about famous scientists from underrepresented groups. The students presented a program to over 75 guests at the banquet celebrating the completion of the weeklong activity. Students also formed working groups and became aware of their learning styles and career choice possibilities. Follow-up activities took place monthly during the year following the summer camp.

Fifty-one students have successfully attended CARNEGIE-HALL of which, 18 have graduated high school. All but two are attending college; the remainders are still enrolled in high schools as juniors and seniors. The college students are attending the followings schools with the following majors:

- Four are attending UK with majors in Math, Biology, Sociology and engineering
- Two are attending UofL with majors in Business and Engineering
- One in Science Education at Berea College (KY)
- One at Eastern Kentucky University in Forensic Science
- One at South East Community and Technical College (KY)
- One at Hazard Community and Technical College (KY)
- One at Howard University (Journalism major)
- One at Mississippi State University (Engineering major)
- Two at Bluegrass Community and Technical College (Engineering majors) (KY)



Year 3 C.A.R.N.E.G.I.E. students go to WVU.

- One received internship and scholarship at Toyota manufacturing with classes at BCTC with paid employment from Toyota
- One at Kentucky State University (Nursing)
- Two are out in the world of work

Another summer bridge program prominent in the LSAMP "family" of institutions is that developed from the first year of the Alliance by **Kentucky State University**.

One hundred and twenty high school juniors and seniors have participated in the summer bridge program on KSU campus from 2007-11. The program consists of 3-weeks on KSU's campus attending inquiry based workshops, seminars, and field trips pertaining to STEM areas. These activities are designed not only to enhance student learning in science, math, engineering and technology, but also to foster familiarity with current research and generate further interest in STEM disciplines.

STEM Clubs and Unique Opportunities

Most noteworthy of the aspiration of KY-WV LSAMP institutions to provide club activities for their students is that of **Bluegrass Community and Technical College (BCTC)**. Their LSAMP STEM Book Scholars Club offers all registered LSAMP club members a book stipend. These students attend tutoring and recruit students, form study groups and take part in other M&I cultural events relating to LSAMP. They have participated in conferences related to STEM where they have made presentations. They have participated in the KY-WV LSAMP Student Research Symposium and have led food and book drives for Africa and in Haiti relief efforts.

Clearly one of the most interesting of the KY-WV LSAMP extracurricular activities is that provided by **West Virginia University (WVS)**. This past summer three WVU LSAMP students participated in a research trip to China. They did faculty-mentored research for eight weeks and traveled to four cities. Each weekend featured a trip to cultural landmarks in this exotic setting that furnished an unforgettable international, intercultural experience for these LSAMP students.

Administrative Support, Leadership and Institutionalization of the KY-WV LSAMP

It is a definite goal of the KY-WV LSAMP to engage the leadership of the partner institutions to progressively integrate the campus' programming and personnel into their programmatic and organizational structures.

This cannot be achieved without the commitment of the Alliance's Board of Governors, the Executive Board and the Campus Coordinators. The time and institutional resources committed to support the LSAMP programs, activities and especially, administration, are substantial.

The Board of Governors (made up of the presidents of each of the 10 institutions, with UK's as its chair) meets regularly and through these meetings each institution has an opportunity to be more informed of the program progress towards goals, share their ideas, share opinions, and ensure adequate representation and feedback, from each collaborating stakeholder.

We have assembled an Executive Board composed of designated proxies from each institution and support stakeholders to ease the scheduling difficulties associated with campus Presidents. University of Kentucky President Lee Todd has been the only Board spokesperson since the inception of the program.

Campus Coordinators from each institution within the Alliance meet regularly monthly with the Co-PI and Executive Director of the program to discuss best practices, problems and solutions, and to celebrate successes and accomplishments. There is a host rotation so that all of the coordinators have an opportunity to highlight their campus activities and get to know how all other alliance partners operate so that best practices from host campuses can be shared, demonstrated and emulated. Host Coordinators give presentations on the implementation of best practices on their campuses. As seen in this Impact Report's section on these individuals, they represent both STEM administrator and STEM faculty leaders on the respective campuses.

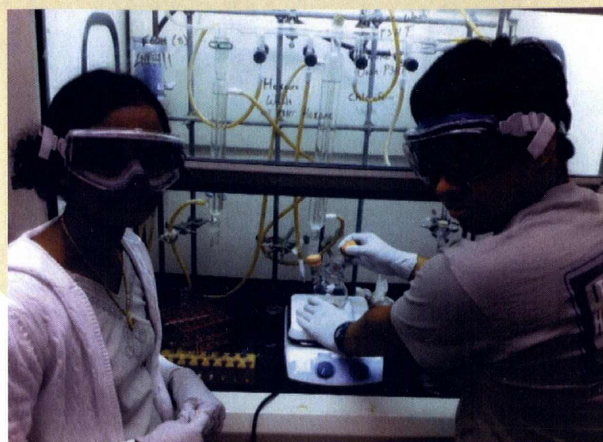
Perhaps the best example of the institutionalization of the KY-WV LSAMP is that of Marshall University.

Dr. Shari Clarke, Vice President for Multicultural Affairs shares her views about her Department's oversight of the Marshall-LSAMP going forward: "The Division of Multicultural Affairs is excited to begin oversight of the Marshall-LSAMP program. As we build on the momentum that the Marshall-LSAMP has experienced under the brief leadership of Multicultural Affairs, we plan to take that momentum well into the future to further our gains

in broadening participation and fostering achievement and the advancement of our students and our institution." She adds, "The current MU-LSAMP provides vital academic and social integration for our students, and they are continually engaged positively through a calendar of events, programs, and initiatives that include but are not limited to: a tutorial program, orientation and bi-monthly meetings, mentor/professional development experiences, establishment and maintenance of on-campus research placement program, research presentation experiences, and preparation and throughput to graduation and graduate school."

Marshall University has demonstrated a slow increase in students of color who have participated in the Louis Stokes Alliance for Minority Participation. A change in leadership has resulted in the discovery of additional students who have participated and subsequently graduated from the Marshall-LSAMP program with baccalaureate degrees. This has resulted in an impressive increase in the broadening of participation among underrepresented minorities in STEM both for our institution and the KY-WV LSAMP as a whole. The Marshall-LSAMP has developed an approach inspired by the Tinto Model upon which the LSAMP stands. Marshall-LSAMP participants attend bi-weekly meetings throughout the year, and students have the opportunity to participate in research activities initiated by MU-LSAMP. The University's chant of "We are Marshall!" expresses our commitment to develop and maintain relationships through our students' academic and professional lives. We demonstrate this commitment through our actions. The Marshall-LSAMP has established strong relationships with research professors on campus. As a result, our students have undergraduate research opportunities in laboratories across the university including the imaging laboratory and biotechnology, engineering, and biology laboratories. The program has been successful in establishing partnerships with these departments and collaborating institutions within the KY-WV LSAMP. The Marshall-LSAMP has partnered with the WVU-LSAMP, C.A.R.N.E.G.I.E.-H.A.L.L. and the Health Sciences and Technology Academy (HSTA) to help establish the critical pipeline of STEM students to Marshall University. West Virginia's nationally recognized program, HSTA, reaches out to 9th - 12th grade underrepresented students and follows them to college and towards professional school to help them prepare for health care careers. The goal is to nurture the ambitions of talented students who, for economic or other reasons, might not ordinarily achieve

these career goals. In addition to this, the Office of Multicultural Affairs has started a new program in collaboration with the Joan C. Edwards School of Medicine to establish Project P.R.E. M.E.D. which is an exploration program designed for college sophomore, junior and senior students of color that provides medical school information. Selected students will participate in an immersion program that exposes them to life as a medical student and life in medical school. These initiatives are a sampling of the academic, social, and financial support that is considered priceless by the Marshall-LSAMP leadership. We say priceless, because what we are endeavoring to do is to take the advice of our nation's leadership by educating our future selves (the next generation of Americans) out of our current global standing and back into our hegemony in STEM.

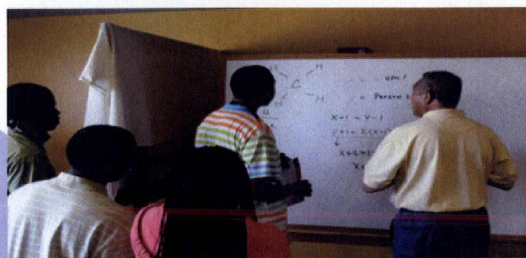


Nicholas Wright, of WKU, with supervisor Hemali Rathnayake. Wright studies the morphology of nanoparticles.

Facilitating Transfer

The KY-WV -LSAMP and the Transfer Center - The collaborative and partnership opportunity presented through the Bluegrass Community and Technical College (BCTC) Transfer Center promises substantial program expansion and innovation for the KY-WV LSAMP in coming years. The Transfer Center and the KY-WV LSAMP have parallel agendas for our scholars. The long-term goal of the KY-WV LSAMP is to greatly enhance our students' baccalaureate degree attainment in STEM. The number one goal in the BCTC strategic plan addresses the great need to expand transfer of general education and /or technical education where needed. The Transfer Center was created to progressively increase the number of community college students receiving bachelor degrees preferably at Kentucky four-year institutions. The BCTC Transfer Center collaborates with most of the public institutions in the state to achieve this goal. The institutions that participate provide professionals from their institutions to physically man positions at the Transfer Center to work with the students interested in transferring to their respective campuses. These professionals work closely with students in high-touch and high-tech, individual advising, course equivalencies, scholarships, calculating GPAs, program prerequisites, application requirements, and ensuring that majors are a good match for the student and the institution. The added benefit for LSAMP is that the Transfer center works directly with the LSAMP coordinators to channel STEM students through the LSAMP. The Transfer Center increased the number of written articulation agreements between our two-year and four-year institutions, provided improved advising services, established a peer-mentoring program, and developed a system to track students that transfer to other institutions. This has been a critical asset in enhancing

the pipeline of potential students for the KY-WV -LSAMP. This collaboration between the BCTC-LSAMP and the Transfer Center has been successful in the increasing number of transfers to four-year institutions of pre-baccalaureate African American students by 5% in 2009 over the baseline of 2007-2008. Of the 93 African American students that transferred to four-year institutions, five were Level-one LSAMP students. Three of these students attended the Alliance's schools. The number of African American transfer students during the baseline year (2007-2008) was 89 students (representing 28.53% of all transfer students that year). Their number in 2008-2009 was 67 students (representing 23.76% of all transfer students that year). The objective is an increase to 93 students (5% increase) by the end of year five of the KY-WV LSAMP project. This achievement demonstrates the impact of this program for more than the KY-WV LSAMP institutions and includes all public institutions in Kentucky. West Virginia, through the Higher Education Policy Commission (HEPC), has established articulation agreements with all West Virginia public institutions and has Kentucky's Transfer Center's approach to use as an exemplar for a similar approach there. When the Transfer Center's AMP grant funding expired, its total operation became a line item in the budget for BCTC, thereby institutionalizing its new approach constructs.



BCTC students in Year One Chemistry 101.

Future Directions and Presidential Partner Support

The KY-WV LSAMP Alliance will build on successful approaches of the first phase while improving or sunsetting underperforming activities. As part of a more aggressive strategy to reach its goals for participation and graduation of LSAMP students, the Alliance will:

1. **Provide better focused more efficacious recruiting** with an increased focus on region's Hispanic populations and on high motivation talented students. First-generation college students will be identified upon acceptance and support services will be engaged for targeted support throughout their college career. This is a successful best practice from the University of Kentucky (UK) NSF-Funded AMSTEMM project.
2. **Shift funds to support high-performing Alliance strategies.** For example, funding will be expanded to cover more expenses for student research participation and provide more travel stipends for student research conference attendance and presentation, as these are key strategies for motivation and retention. We will leverage ongoing partner campus research programs (e.g., REU's and IGERT programs) and aggressively pursue other funding sources that support undergraduate research experiences, such as DOE, NETL, and NASA minority programs. Further, we will expand collaborations with regional industries interested in supporting minority STEM education (e.g. Toyota Foundation funding of projects of the Partnership Institute for Math and Science Education Reform (PIMSER)).
3. **Expand alliance research symposium participation and impact by partnering with other LSAMPS** (e.g., the Peach State and Tennessee LSAMP Alliances).
4. **Reduce previous administrative challenges by using UK's PIMSER to handle processes for finance and administration.** This will eliminate delays and problems in fund disbursement for student support. The Alliance also proposes to provide an online Operation Manual to clearly explain processes for invoicing, indicate criteria for acceptance to LSAMP and other aspects of the Alliance operations as needed.
5. **Employ major improvements in tracking of students that quickly recognize at-risk behaviors**

through improved data management, determination of outcomes and milestones (assisted by a new internal evaluator).

6. **Improve inter-alliance coordination of programs** via teleconferences and webinars that enable more frequent meetings among alliance members and governance boards. In addition, a newly-created external advisory board will include members from other NSF funded LSAMPs to expand Alliance connections to universal goals and best practices. Former Alliance PI and UK President Lee T. Todd has been asked to chair the board.
7. All the above approaches will be actively driven by a **new management team** including a new PI (UK Provost and physicist, Kumble Subbaswamy) and new co-PIs, as well as new campus coordinators at several partner campuses. Note that UK's new president has just completed a university review that targets undergraduate education and inclusion/diversity as priority areas for improvement.
8. **Institutionalize** UK's Central LSAMP support staff to provide efficiency of management, higher campus visibility, and greater emphasis of the role of LSAMP in serving the University's strategic goals on diversity.

The above steps address the main challenges encountered in the KY-WV LSAMP Alliance Phase 1 program, as identified by external evaluators and participant debriefing. Essentially, future directions mean promising Phase 1 core strategies are enhanced or improved and execution of all strategies is driven by a redesigned management structure, adjustments in personnel duties and vastly improved coordination and communication of Alliance partner activities and best practices. Alliance Partnership Support remains strong for the future directions described in the KY-WV LSAMP's proposal for its next phase, the mid-level Alliance. Letters expressing this support have been received by the Principal Investigator, Dr. Kumble Subbaswamy, from the presidents of the University of Louisville, West Virginia University, West Virginia State University, Marshall University, Western Kentucky University, Kentucky State University, Centre College, and Bluegrass Community and Technical College.

Economic Impact

Summary of Additional Work-Life, Earnings Analysis and STEM-Career Needs ^{1,4}

- STEM occupations are projected to grow by 17 percent from 2008-2018 compared to 9.8 percent for non-STEM occupations.
- STEM workers command 26% higher earnings (Bachelor's degree level) than their non-STEM counterparts.
- STEM degree holders enjoy higher earnings regardless of whether they work in STEM or non-STEM occupations
- More than two-thirds of STEM workers have at least a college degree, compared to less than one-third of non-STEM workers.
- West Virginia will require 25,000 STEM-related jobs by 2018.
- Kentucky will require 64,000 STEM-related jobs by 2018.

An economic impact estimation for the KY-WV LSAMP Alliance should consider two of the primary goals of the program. These are the economic benefit to the student participants and the impact of the program's graduates on the economy of Kentucky and West Virginia, the states in which the Alliance partner institutions reside.

Direct Economic Impact on KY-WV LSAMP Graduates

The KY-WV LSAMP Alliance, as well as the national program funded by the National Science Foundation (NSF), supports students in science, technology, engineering, and mathematics (STEM) degree programs from targeted underrepresented minority populations. This not only provides a numerical enhancement of the STEM career pipeline that will increase our nation's critically-needed, global economic competitiveness, but also diversifies this workforce with

professionals in proportion to their increasing numbers in the general population.

The direct economic benefit to the participating students itself has two dimensions. First, the program's objectives include providing support to students that, without such intervention, may not have earned higher education degrees in the STEM or other disciplines. From the increases in grade point averages and other indicators, the KY-WV LSAMP Alliance is increasing student success and retention. Secondly, the graduates supported by the KY-WV LSAMP Alliance benefit economically from the higher paying jobs available to bachelor-degree holders compared to high school graduates. This ratio of higher earnings of bachelor degree-holders is estimated by the U.S. Department of Commerce's Economic and Statistics Administration (2011) to be over 1.8 times those holding only a high school diploma.¹ Furthermore, there is an additional average annual earnings benefit if those bachelor degrees are in STEM disciplines. The ratio rises to 2.3 for STEM bachelor degree holders over non-STEM high school graduates.¹

The theoretical increase in yearly earnings for holders of STEM bachelor's degrees over those with non-STEM bachelor's degrees, therefore, averages \$15,683.¹ This direct economic impact on the earnings potential of the KY-WV LSAMP's students is accompanied by the significant social impact of a more diverse qualified STEM workforce.

Impact of the KY-WV LSAMP Alliance Graduates on the Economies of Their Communities and States

The estimation of the economic impact of the KY-WV LSAMP Alliance on the states in which the ten Alliance institutions are located is much more complex and subject to a number of qualifying assumptions. In addition, this Alliance's STEM graduates are only now either entering graduate school (see student profiles and accomplishments) or the workforce with bachelor degrees. However, there are the following interesting statistics that offer positive, even if theoretical, estimates of this second type of economic impact:

- The baseline of numbers of STEM bachelor degree graduates from the eight KY-WV LSAMP higher

¹ Langdon, D. et al. 2011. STEM: Good Jobs Now and for the Future. U.S. Department of Commerce Economics and Statistics Division.

education institutions, from the five years prior to the project's beginning was 128. The average annual bachelor degree attainment of graduates of the program over its five years (year five estimated) was 168. Therefore, 200 students with STEM degrees were added to the workforce or graduate school over these five years of the initial Alliance.

- Using the University of Kentucky alumni data, 76.7% of STEM graduates remain in the state. For West Virginia, no current overall STEM alumni retention in the workplace has been obtained. However, Hammon and Leguizamon (2008) report that the percentages of alumni remaining in state from programs in Engineering, Physical Sciences, Biological and Biomedical Sciences, and Mathematics are 29.7, 33.7, 35.6, and 26.8, respectively.² This lower percentage is consistent with the recent findings in West Virginia's K-12 STEM Ed Report 2011 that the majority of the state's STEM graduates leave the state for lack of jobs.³ Therefore, an estimated one-third of STEM graduates remain in the state at this time.

- The Georgetown University Center on Education and the Workforce (2010) estimates that West Virginia will need to fill 25,000 STEM-related jobs to grow its economy.⁴

² Hammond, G.W. and Leguizamon, L.S. 2008. From Higher Education to Work in West Virginia. Bureau of Business and Economic Research, Morgantown, WV.

³ West Virginia's K-12 STEM Ed Report 2011. STEM Connector™. www.stemconnector.org

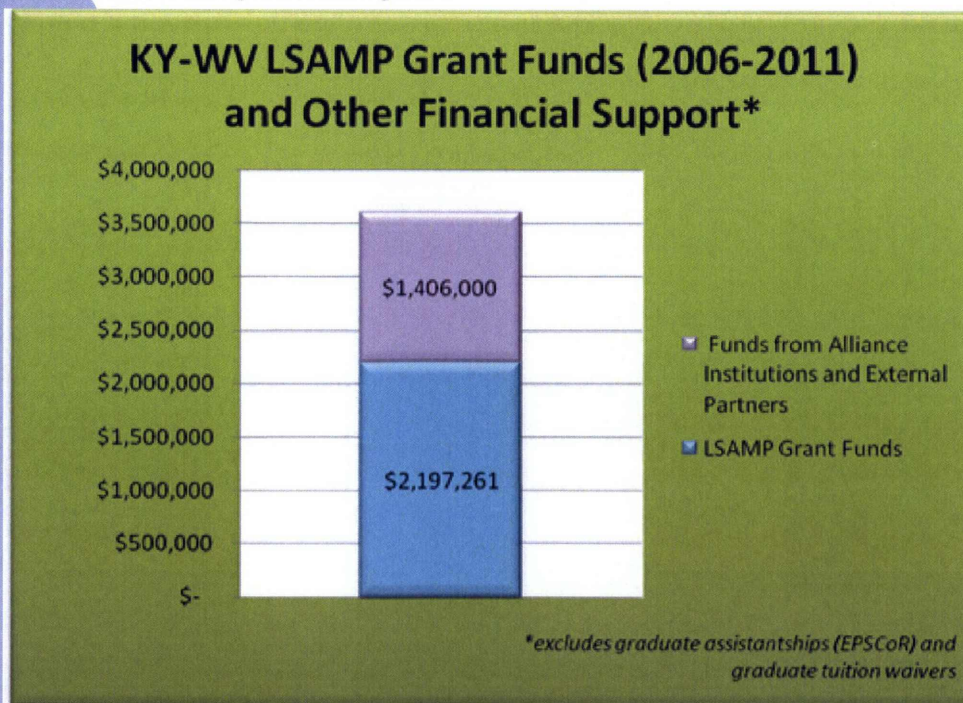
⁴ Georgetown University Center on Education and the Workforce. 2010. Help Wanted: Projections of Jobs and Education Requirements through 2018.

- The projections of STEM-related jobs needed by West Virginia and Kentucky will ensure that the demand for graduates of the KY-WV LSAMP Alliance's programs will remain high.

- If all of the above assumptions and estimations were to hold, the potential addition of workforce earnings of the KY-WV LSAMP STEM graduates would be about two million dollars annually for the economies of these two states.

Added Economic Impact to the KY-WV LSAMP Partner Institutions from the LSAMP Grant and Leveraged Funds within the Institutions

The KY-WV LSAMP grant awarded to the Alliance partner institutions was \$2,197,261 over the past five years. This is the unweighted direct impact on the intuitions, their supporting staff and facilities, and students. However, the Alliance institutions have leveraged other funds from within and external partners to supplement these direct grant funds. The amount from institutions was at least \$1,300,000 with another \$106,000 from external sources, not counting graduate support staff assistantships from the Kentucky and West Virginia EPSCoR and tuition waivers from the graduate schools. These additional funds supported graduate student mentors and support staff, the summer program in some locations of the C.A.R.N.E.G.I.E. H.A.L.L. program, recruitment programs and undergraduate student research.

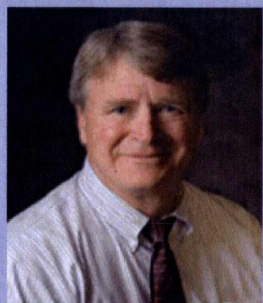


Alliance Campus Coordinators



Charlene Walker, Vice-President of Multiculturalism, and Inclusion at Bluegrass Community and Technical College (BCTC), is the BCTC-LSAMP Coordinator. Vice President Walker has a Masters degree in Counseling and Bachelors in Social Work from Eastern Kentucky University. In addition to coordinating the BCTC-LSAMP, Vice

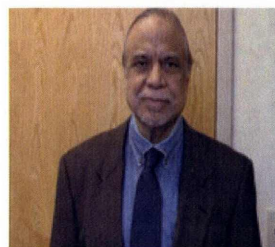
President Walker is a full professor in Student Development and Counseling. She has postgraduate work in Women's Studies and Appalachian Studies from the University of Kentucky and Diversity Management coursework from Cornell University in New York, NY. Prior to becoming involved in academia Charlene was employed as a social worker in the Appalachian region of Eastern Kentucky in Family and Protective Services. She later served as a Physical Planner providing technical assistance to local governments, and the Kentucky River Area Development district with primary focus on environmental audits. Her first experience as an educator was the program director of a career awareness program for displaced homemakers for Hazard Community College. She has presented extensively at State and National Conferences on issues related to sexism, racism, and classism, she has served as chair of the National Conference for Community and Justice. She is a member of numerous civic and community organizations including Kentucky Organ Donors Association (KODA), Kentucky Association of Blacks in Higher Education and is past Associate for The University of Kentucky Appalachian Center. She is also an alumnus of Leadership Bluegrass and Leadership Kentucky. She is the founder and director of the KY-WV LSAMP, CARN-EGIE HALL a STEM camp for high school juniors and seniors from the burgeoning population. She has received numerous local and national awards however; she is most proud of the, A Teacher Who Made a Difference award from the University Of Kentucky College Of Education (2010).



Preston Miles, the Centre-LSAMP Coordinator and is professor of chemistry at Centre College, where he has taught since 1981. He has held the Walkup Professorship of Chemistry since 1997. Dr. Miles is an analytical chemist who worked in research and development in private industry before joining the Centre

faculty. He is deeply committed to getting Centre students involved in collaborative research. His research has focused on the development and application of methods for trace level analyses. Current projects include the Determination of Toxic Heavy Metals in Woody Plant Materials, the Determination of Cortisol in Urine and Feces from both Captive and Wild Wooly Monkey Populations, and most recently, the Determination of PPCP's in Surface Waters.

Dr. Ami M. Smith was recently appointed as the new Program Leader for the West Virginia State University Center for the Advancement of Science Technology, Engineering, and Mathematics (CASTEM). She graduated from West Virginia State University in 2003 with a B.S. in Biology. In 2009 she earned a Ph.D. in Biosciences from the University of Exeter, Exeter UK. After a year as a postdoctoral scientist at West Virginia State University, she became an Assistant Research Professor at the WVU Gus R. Douglass Institute in 2010. Dr. Smith has been engaged in research pertaining to the microbiology of anaerobic digesters since her days as an undergraduate student and has recently engaged in research based science education for high school teachers and students.



Dr. T.S. Kochhar, Distinguished Professor of Biology at Kentucky State University has been involved in student training-related grant activities for more than thirty years by funding through NIH, NSF, and other agencies. He participated in NIH MBRS Program (as PI, 1977-86; and as Program Director,

1986-98), NIH-Extramural Associates Research Development Award (EARDA) program (2000-2008) as PI, and a lead faculty for NCCR's Kentucky Biomedical Research Infrastructure Network (BRIN) program (2001-04). At present, he is the Campus Coordinator for KY-WV NSF-Louis Stokes Alliance for Minority Participation (LSAMP) program. He has been on MBRS ad hoc review panels and NSF's training grant panels. Through these programs, Dr. Kochhar has guided more than 150 undergraduate science majors to pursue careers in biomedical and STEM disciplines. He continues to sponsor students for extramural summer research experience at reputed research-intensive institutions. In addition, he has sponsored students at NIH training programs - NIAID's Introduction to Biomedical Research (now known as the Intramural NIAID Research Opportunities) in Bethesda, MD. His international experience includes a Fulbright in the Philippines in 2006 and teaching at the Central American Health Science University, Belize City, Belize.

Mary E. Clark is the Program Coordinator for the Marshall-Louis Stokes Alliance for Minority Participation. Clark earned a bachelor's degree in mass communications from South East Missouri University (SEMO) in 1998 and later earned a master's degree in guidance and counseling with an emphasis in higher education. In addition, Clark has completed her class work toward a Ph.D. in higher education administration from Saint Louis University and is currently the process of completing her dissertation. Clark works under the leadership of Dr. Shari Clarke, Vice President for Multicultural Affairs. Developing community among the students of color who are STEM majors is the focus of Clark's work. In addition to working with LSAMP, Clark has assumed other programming and administrative responsibilities within the Office of Multicultural Affairs. Clark in collaboration with Dr. Shari Clarke wrote and received a West Virginia Higher Education Policy grant in support of Project P.R.E. M.E.D., which is the initiative between the Office of Multicultural Affairs and the Joan C. Edwards School of Medicine. Other major initiatives and outreach that Clark has worked

on includes: the Ivy Academy Leadership Conference for girls; leadership and support to the National Pan-Hellenic Council; the Marshall University and Alcorn State University Faculty Exchange Initiative; coordinator, speaker and co-director of the Marshall University Week of Welcome Diversity Plenary; and conduct the research and development for a cultural competency certificate.



Dr. Ingrid St. Omer, the University of Kentucky –LSAMP Coordinator an Assistant Professor at the University of Kentucky in the department of Electrical & Computer Engineering. She was the Co-Principal Investigator for the ten-institution Kentucky – West Virginia Alliance for Minority Participation, and currently serves as the Campus

Coordinator for the UK program. Prior to earning her doctorate, she worked in industry at Rosemount Inc., attaining the rank of Senior Engineer and Engineering Supervisor. Upon completion of her Ph.D. at the University of Missouri-Columbia (MU), she served as a Visiting Assistant Professor in the MU Department of Electrical Engineering, a Research Associate, and President's Postdoctoral Fellow at the University of Minnesota, and an Assistant Professor and Director of the Advanced Microelectronics Laboratory at Northern Arizona University. Dr. St. Omer is an active member of IEEE, MRS, ASEE, and NSBE AE. She has also held several leadership positions at the national level during her academic career.



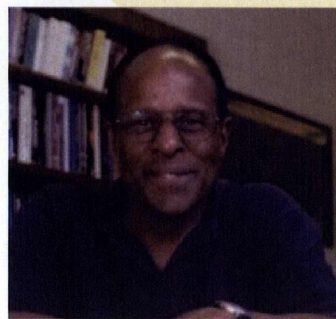
Dr. Pamela Feldhoff completed her Ph.D. in Genetics/Biochemistry, at Florida State University in 1979 under the direction of Drs. Richard Winzler and Eugene Davidson. She did postdoctoral research in the Biochemistry Department at the University of Louisville School of Medicine and held an NIH/NCI Postdoctoral Fellowship (1979-1981). Dr. Feldhoff joined the Department of Medicine/Nephrology at the

University of Louisville in 1981. She spent a sabbatical year (1990-1991) at the Pennsylvania State University College of Medicine in the Department of Cellular & Molecular Physiology. Subsequently, Dr. Feldhoff joined the Department of Medicine/Medical Oncology & Hematology at the University of Louisville, where she rose to the rank of Associate Professor. Dr. Feldhoff is currently a faculty member in the Department of Biochemistry & Molecular Biology at the University of Louisville (1997-present). Her research has been supported by numerous grants from the NIH, NSF and other sources. She has published over 40 research articles and has three patents. She is a member of the American Chemical Society, the American Society for Biochemistry and Molecular Biology, the Protein Society and the Society for Glycobiology. She has served as Assistant (2001-2006) and now Associate Vice President for Research (2006-present).



Dr. David Miller, Coordinator, West Virginia University –LSAMP is currently an Assistant Professor of Mathematics at West Virginia University with a research area of undergraduate mathematics. He teaches a variety of undergraduate courses in mathematics and graduate courses in mathematics education. His current research has focused on using cognitive science to help students learn in

college algebra and calculus. In addition, he has worked on research on how technology can help students learn mathematics and study students' proof schemes as they transition into upper level mathematics. In addition to working on the NSF KY-WV LSAMP grant, Dr. Miller has collaborating with science educators on the NSF CCLI phase 2 "WVU Summer Institute" grant, the NSF NOYCE TEACH-WV, and the NSF Project Kaleidoscope (PKAL) grant. Finally, Dr. Miller has secured various internal and state grants to support his work with underrepresented students in STEM.



Dr. Charles H. McGruder, III

is the Coordinator for the Western Kentucky University-LSAMI, obtained a B.S. Degree from Caltech and his PhD from the University of Heidelberg, Germany - both in Astronomy. He is the William McCormack Professor of Physics at Western Kentucky University. His research interests are General

Relativity, Gamma Ray Bursts, Exoplanets, and Eclipsing Binaries. He is a Past President of the National Society of Black Physicists. He is interested in promoting astronomy in Africa and with a \$355,000 grant from the Kellogg Foundation; he has been actively pursuing this endeavor.



West Virginia student Larry Rush conducts research in the lab.

Student Successes



Joseph Wilkins: Mentored by Dr. Benjamin McCall. In 2011 Joseph presented at Posters at-the-Capitol and the UofL University-Wide Undergraduate Research Symposium. Project: Exploring Isothermal Layers in the Stable Atmospheric

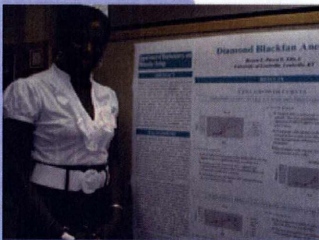
Boundary Layer. The latter is new since Mr. Wilkins work presented in 2009-2010 "Introduction to Numerical Modeling of the Atmosphere", that won "Best Poster" Award at the KY-WV LSAMP 4th Annual Student Research Symposium in Lexington, KY April 16-17, 2010.

Mr. Wilkins graduated May 2011 and was accepted into the Ph.D. program at St. Louis University in Atmospheric Science. He was awarded a full graduate research assistantship. He is working on a NASA funded project in pollution modeling.



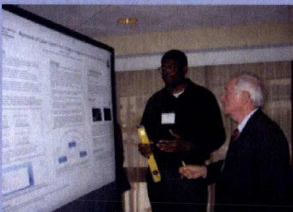
Sean Wint: Mentored by Dr. Robert Cohn. Project: Nanotechnology Research: Surface Tension, Viscosity and Evaporation rate of Solvent and Polymeric Liquids. Mr. Wint was a GEM Fellow and was accepted for the Bridge-to-the-Doctorate

Program at the University of Maryland fall 2010.



Lecia Brown: Mentored by Dr. Steve Ellis, Biochemistry and Molecular Biology. Project: Diamond Blackfan Anemia. Lecia was supported for the 10-week, research-intensive, one-on-one, LSAMP summer research program in 2008. Lecia, a LSAMP

Scholar and a member of the UofL Volleyball Team. graduated in May 2010.



Matthew Wiggins: Currently a junior at the University of Kentucky majoring in computer engineering. Matthew transferred to UK from Bluegrass Community and Technical College where he was Vice-President of the LSAMP club. Matthew

was always looked up to by other students at BCTC not just because he is 7 ft. tall but because of his positive outlook on life. He would always tell students "that basketball is not the only thing a tall person can do". Matthew is a role model to young students who are interested in STEM and has served as a tutor. Matthew has presented on several occasions in his area of research and at the UK/WV LSAMP symposium. Matthew will be a 2013 graduate of the University of KY.



Victoria Paige Cloud: A graduate of the University of Kentucky (UK) with a Bachelor of Science in Mathematics after transferring from Bluegrass Community and Technical College. Victoria came to BCTC after an initial unsuccessful attempt

at the University of KY. After attending Bluegrass Community and Technical College (BCTC) to obtain a technical degree she was able to successful balance family, school, and work, as well as some extracurricular activities. Victoria became involved in the Louis Stokes Alliance for Minority Participation (LSAMP) program and even became President LSAMP student organization there. After completing her Associated in Applied Science in Civil Engineering Technology she went back to UK to complete a Bachelor's in Mathematics. She is currently a Developmental Mathematics Instructor at South East Community College and is expecting to enroll at Western KY University in the spring to complete Master's Degree in mathematics.



Maya Bentley began her collegiate career as an Undeclared Engineering student at the University of Kentucky. At the end of her sophomore year, Maya declared Biosystems and Agriculture Engineering (BAE). She is now in her junior year and is considering specializing in Food and Bioprocessing Engineering. In 2011, Maya assisted graduate students in their research on the cultivation of Algae.

Maya hopes to be studying abroad through the

BAE department in Vicosa, Brazil. Upon her return to UK, Maya expects to begin a research project of her own.



Joyce Achenjang is currently a senior at the University of Kentucky studying Biology and Psychology, and she plans to attend medical school in the fall of 2012. As a participant in the Kentucky-West Virginia (KY - WV) LSAMP Program she found the opportunities to engage in research in anatomy with the UK College of Medicine. During the summer of her junior year, she participated in the Bucks for

Brains Summer Research Program where continued her research with her faculty mentor conducting body composition studies on Woolly Monkeys. She also completed an internship at the Gill Heart Clinic.



Melinda Jean-Louis is a Civil Engineering fourth year student attending the University of Kentucky. The KY - WV LSAMP program facilitated her participation in research on linear soil model generation and the effects of soil compaction. Melinda presented this research at the 2010 National Conference on Undergraduate Research (NCUR) in Missoula, Montana. She recently submitted a paper to an international conference in Perth, Australia.

lia that has been accepted for presentation and publication in November 2011. She was awarded a Fulbright scholarship to study German culture and diversity in Potsdam, Germany in 2009. Her future plan is to attend graduate school for a Master's degree focused on transportation.



Jacquéz Leandre is a Junior Civil Engineering major at the University of Kentucky. He has studied abroad in Berlin during the summer of 2009. He has also been a participant in the KY – WV Louis Stokes Alliance for Minority Participation program for three years. He was awarded the William C. Parker full-tuition scholarship. Jacquéz also participates in the Appalachian and Minority Science, Technology, Engineering, and Mathematics Majors (AMSTEMM) program.



Raven Price is in her final year as an undergraduate student at the University of Kentucky (UK). In 2012, she will be graduating with a degree in biology. While at UK, she conducted research in physiology. She has won awards from the Appalachian & Minority Science, Technology, Engineering, & Mathematics Majors (AMSTEMM) research fellowship, and the Gertrude Flora Ribble Research Scholarship administered by the Biology Department. She is a KY - WV LSAMP scholar and peer mentor. After finishing her undergraduate degree, she plans on attending medical school.



Ralph Saint Pierre is currently a senior at the University of Kentucky majoring in Mechanical Engineering. He is a recipient of the William C. Parker Scholarship, and the Women and Philanthropy Scholarship. Ralph has conducted research that focused on shape memory alloys for aerospace applications. He presented his research during the 2010 KY - WV LSAMP in Lexington Kentucky. He has served as a peer-mentor for the Ky – WV LSAMP program for over a year. Ralph plans on attending graduate school in the future.



Alysha Lewis earned her baccalaureate degree in Agricultural Biotechnology from the University of Kentucky in May 2011. She received funding through the KY – WV LSAMP for research activities. LSAMP allowed Alysha to present her research at the 2009 Annual Biomedical Research Conference for Minority Students. Her research focused on developing renewable lubricants using cyclopropyl fatty acids. Alysha realized that STEM was a vital field to pursue when she began to attend national conferences and read scientific literature. Alysha is pursuing a Master of Public Health degree at the University of Kentucky.



Consolee Karangwa is pursuing a baccalaureate degree in Biology with a Minor in Business Administration at the University of Kentucky. She will matriculate in December 2011. Consolee was involved in undergraduate research in a plant proteolysis microbiology lab. She presented her research at numerous regional and national conferences, most notably the Annual Biomedical Research Conference for Minority Students. Consolee has served as a peer-mentor for the KY – WV LSAMP program. She is interested in pursuing biomedical research. Consolee is seeking a post-baccalaureate research position, and she plans to earn a PhD in a biomedical science.



Regina Marie Lewis is in her first year of graduate school at the University of Kentucky. She completed her baccalaureate degree in Human Nutrition, and is currently working on her Masters of Science in Nutritional Sciences at UK. Regina has received the Lyman T. Johnson Fellowship for her graduate work. Regina discovered her love for science at a very early age and excelled in her AP courses in high school. Regina has traveled extensively to experience first-hand the differences in cultural nutritional practices and their associated health influences. As a senior, Regina completed independent research on nutritional status and living location. Regina's involvement in the KY - WV LSAMP program has ignited her passion for research in the Nutritional Sciences and served as a conduit for her current graduate research assistantship. Regina would like to pursue a PhD in the field of nutrition and contribute to preventing various health related diseases.



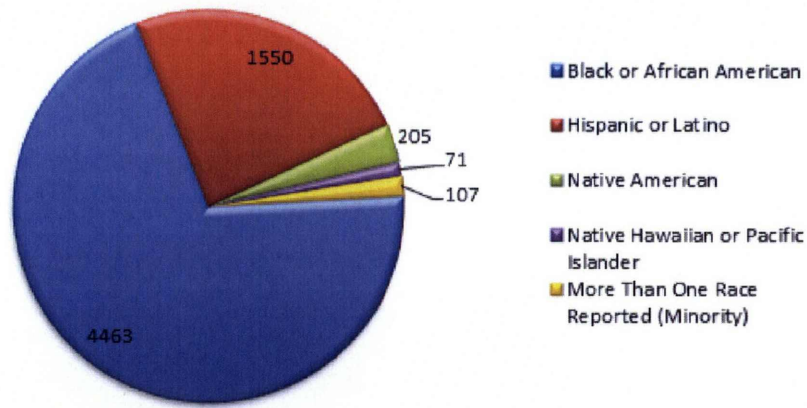
Amber Simpson will complete her B.S. in Agricultural Biotechnology at the University of Kentucky in December 2011, where she is an LSAMP scholar and peer mentor. She was a research intern at the University of Massachusetts Medical School during the summer of 2010 investigating specific innate immune response signaling pathways. Currently, she is conducting research at the UK Gluck Equine Research Center, examining the effect of age on telomerase activity in equine species. Amber will present this research at the 2011 Conference of Research Workers in Animal Diseases meeting. Amber intends to pursue a dual MD/PhD program in the biomedical sciences



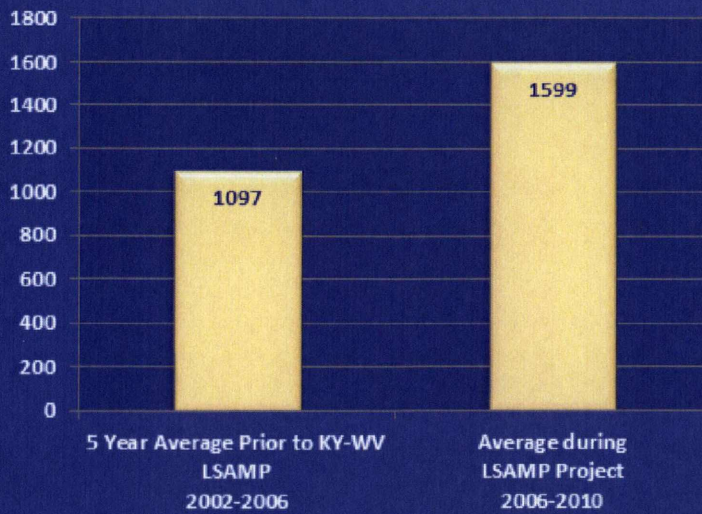
Heba Yusuf is a fourth-year student at the University of Kentucky (UK) in Lexington, KY. She is pursuing Bachelor of Science degrees in both psychology and biology with an expected matriculation date in May 2012. Upon entering UK in the fall of 2008, she was awarded the William C. Parker full tuition academic scholarship. She is a Louis Stokes Alliance for Minority Participation (KY - WV LSAMP) scholar and peer mentor. Heba conducted bioengineering research and presented her research project at the 2011 UK Showcase of Undergraduate Scholars. Following graduation, she wishes to continue her academic pursuits in the medical field.

Program Outcomes

Underrepresented Minorities Enrolled Full-time in STEM at KY-WV LSAMP Institutions (2006-2010)



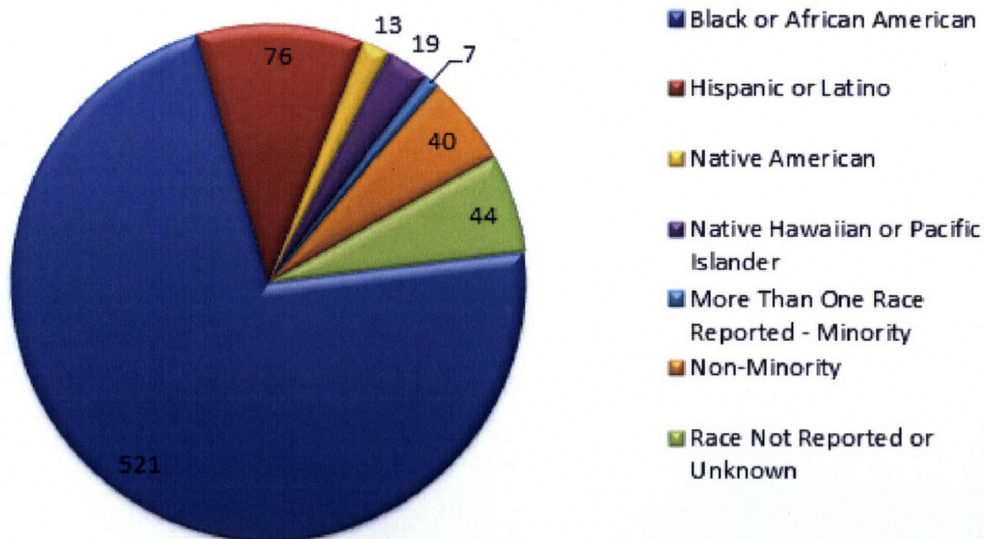
Average Underrepresented Minority STEM Enrollment at KY-WV LSAMP Alliance Institutions



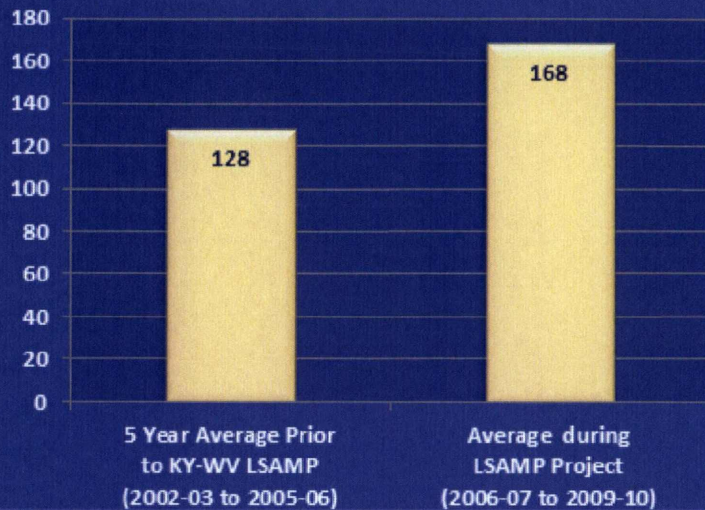
STEM Direct Participants Report for KY-WV LSAMP Institutions by Race/Ethnicity and Academic Year

Race/Ethnicity	2006-2007	2007-2008	2008-2009	2009-2010
Black or African American	1306	1257	931	969
Hispanic or Latino	426	393	509	222
Native American	61	56	41	47
Native Hawaiian or Pacific Islander	22	34	12	3
More Than One Race Reported (Minority)	1	11	3	92
Total	1816-9.86%	1751-10.30%	1496-11.60%	1333-10.04%

STEM Direct Participants at KY-WV LSAMP Institutions by Race/Ethnicity 2006-2011



Average Number of STEM Bachelor's Degrees Awarded to Underrepresented Minorities



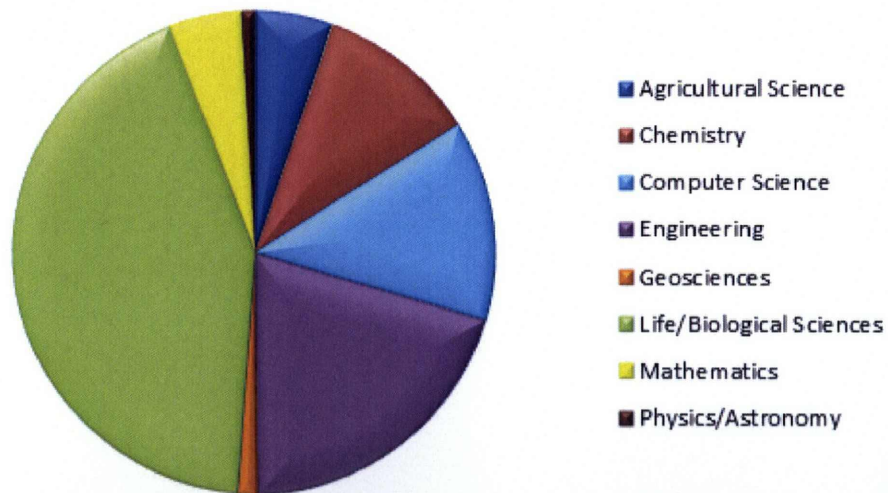
STEM Bachelor's Degrees Awarded by KY-WV LSAMP Alliance Institutions (2006-2010)

Institution	Minority	Non-Minority	Unknown	Total
Centre College (KY)	12	246	0	258
Kentucky State University	100	31	4	135
Marshall University (WV)	27	407	13	447
University of Kentucky	127	3158	123	3408
University of Louisville (KY)	261	2252	30	2543
West Virginia State University	29	44	4	77
West Virginia University	162	2508	1172	3842h
Western Kentucky University	43	953	40	1036
Total	761	9599	1386	11746

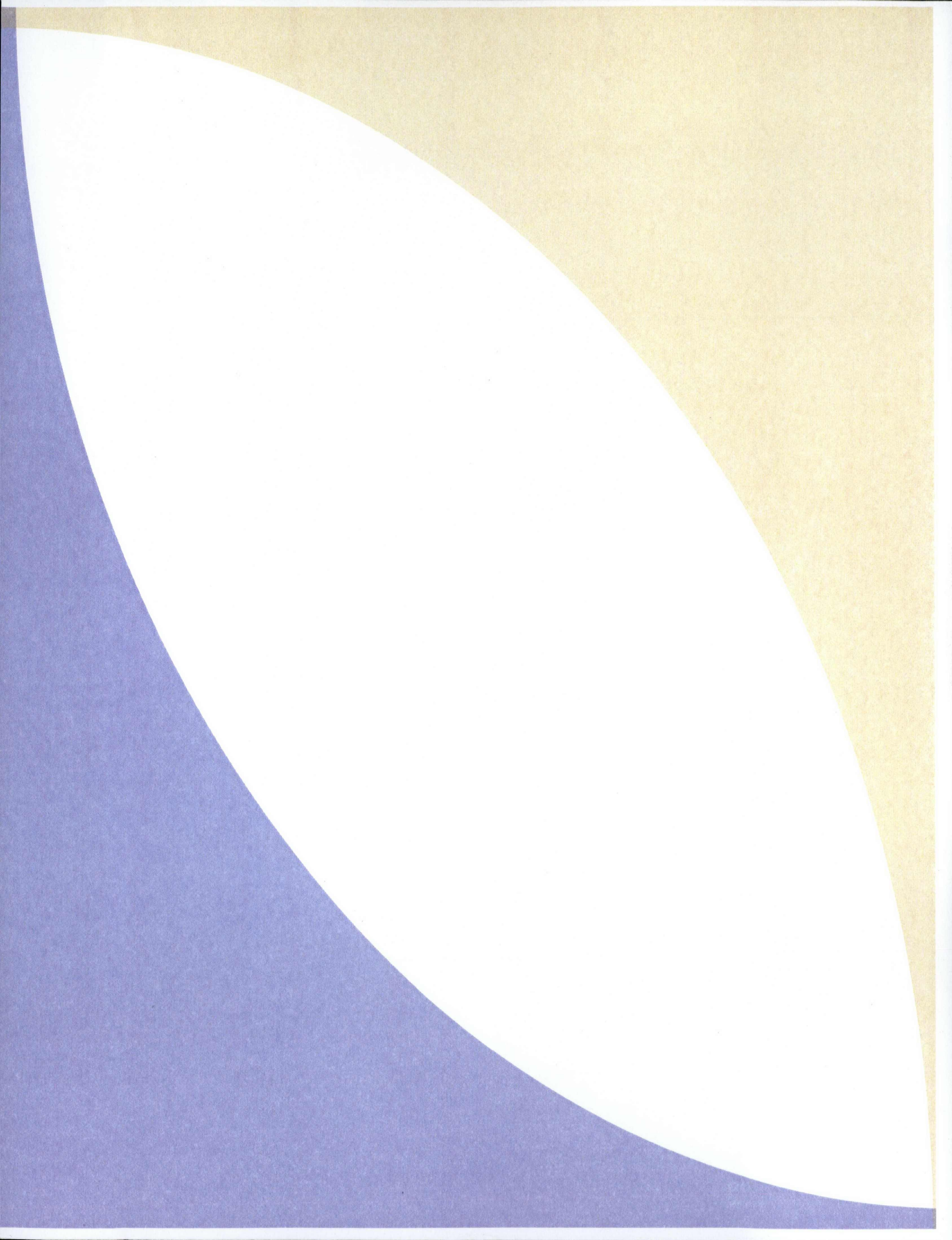
STEM Bachelor's Degrees Awarded by KY-WV LSAMP Alliance Institutions (2006-2010)

Institution	Minority	Non-Minority	Unknown	Total
Centre College (KY)	12	246	0	258
Kentucky State University	100	31	4	135
Marshall University (WV)	27	407	13	447
University of Kentucky	127	3158	123	3408
University of Louisville (KY)	261	2252	30	2543
West Virginia State University	29	44	4	77
West Virginia University	162	2508	1172	3842
Western Kentucky University	43	953	40	1036
Total	761	9599	1386	11746

**Distribution of STEM Degrees Earned by Underrepresented
Minorities at KY-WV LSAMP Alliance Institutions
2006-2010**



NOTES:



Kentucky-West Virginia Louis Stokes Alliance for Minority Participation Impact Report

