

Auburn University

Journey

College of Sciences and Mathematics 2010

**COSAM DEAN
STEWART
SCHNELLER
STEPS DOWN:**
legacy reflected
in success of
students
and faculty



COLLEGE OF SCIENCES
AND MATHEMATICS



COSAM Was Here...

Biological Sciences Professor Dr. Geoff Hill in the Choctawhatchee River in the Florida Panhandle, searching for the rare, elusive and majestic Ivory-billed Woodpecker.



COLLEGE OF SCIENCES
AND MATHEMATICS

AUBURN UNIVERSITY IS AN EQUAL OPPORTUNITY EDUCATIONAL INSTITUTION / EMPLOYER.



A MESSAGE

FROM THE DEAN

STEWART SCHNELLER

FAREWELL BUT NOT GOODBYE

In just five short months I will conclude a very rewarding 16.5 years as Dean of the College of Sciences and Mathematics. I will miss the synergism that has accompanied daily interactions with inspirational and creative colleagues, excellent students, and shared time with alums and friends of the College as they visit the campus or welcome me into their communities. It has been fulfilling seeing that the whole is indeed "greater than the sum of its parts." I am touched with the affection that accompanies the use of the acronym "COSAM," which seems to convey more of a culture than a College and has found itself in a prominent position in the Auburn University lexicon.

In going to my academic home, I will still be part of the COSAM *Journey* by joining my faculty colleagues in the Department of Chemistry and Biochemistry and engaging in teaching and research. In this role I will be close to students in the classroom, where I look forward to engaging them with 21st century instruction delivery, and to my Ph.D. students and postdoctoral associates and their pursuit of therapeutic drug discovery.

Auburn University has been good to me, and I have been honored to serve as one of its deans.

Now, I invite you to experience another amazing year for COSAM in this issue of *Journey* by enjoying the accomplishments of faculty, students, staff and alums. You will see why I have often said that, as Dean of the College of Sciences and Mathematics, I have had the best job on campus.

Best to you in the Auburn way,

Dr. Stewart Schneller,
Dean and Professor

1994

2009



THE TIMES THEY ARE A-CHANGIN'

2010 Journey/Spectrum

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COSAM

Mission Statement

The mission of the Auburn University College of Sciences and Mathematics is three-fold: to *teach* by providing an environment that ensures excellence in the biological, physical, and mathematical sciences for the purpose of preserving, interpreting, and conveying existing knowledge; to *research* by creating, integrating, and applying new knowledge; and to *reach out* to others by fostering educational exchange within the university, the Alabama community, and society as a whole.

Dean and Professor
Dr. Stewart Schneller
Associate Dean for Academic Affairs
Dr. Larry Wit
Associate Dean for Research
Dr. Marie Wooten
Associate Dean for Diversity and Multicultural Affairs
Dr. Velma Becton Richardson '82
Director of Outreach
Mary Lou Ewald
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Journey/Spectrum is paid for by alumni and friends of the College of Sciences and Mathematics.

The Auburn University College of Sciences and Mathematics is committed to providing opportunities of inclusion for its faculty, staff and students. For more information on the Auburn University College of Sciences and Mathematics, visit www.auburn.edu/cosam



A MESSAGE

FROM THE PRESIDENT

JAY GOGUE

When the Auburn Research Park opened in 2008, it assumed a vital mission to support the state in moving toward a knowledge-based economy. By establishing an atmosphere where business and research come together to foster creativity and innovation, the research park will enhance the economic vitality of the community, state and region.

Auburn faculty and researchers have worked to bring in private-sector investment and federal grants and made great progress toward this goal, leading to the construction of two new centers.

In February, Auburn University broke ground for its new 45,000-square-foot Magnetic Resonance Imaging Research Center that is scheduled for completion in September. The center will house one of the world's few 7-Tesla MRIs, the most powerful available.

A master research agreement signed last year with Siemens will advance Auburn to the forefront of biomedical engineering and has the potential to bring lifesaving technologies to the citizens of Alabama and the region. Examples of current and potential areas of MRI-related research include brain function, metabolic imaging and pharmaceuticals, as well research into diabetes and heart disease.

The University will match \$14.4 million in federal funds from the U.S. Department of Commerce's National Institute of Standards and Technology as cost-share support to build a Center for Advanced Science, Innovation and Commerce.

The 68,000-square-foot, 21-lab facility will contain five multidisciplinary "research clusters" where scientists from a variety of disciplines across campus will collaborate on research projects aimed at improving standards, measurements and forecasting related to food safety, bioenergy technologies, aquaculture development and sustainability, and water and environmental quality.

The new research center is scheduled for completion by the end of 2012.

These two new additions to the Auburn Research Park will soon have a major impact on the University in keeping with Auburn's goal to seek innovation, discovery and knowledge to improve people's lives.

War Eagle,

Jay Gogue

A MESSAGE

FROM THE ASSOCIATE DEAN FOR ACADEMIC AFFAIRS

LARRY WIT



It's the first of the year, and that means I have the opportunity to catch up with all of you via this article in *Journey*. As always, I am pleased to do so.

Once again we brought in a bumper freshman class into COSAM this past fall. Seven-hundred-and-eighty-one new freshmen began their Auburn experience bringing our overall enrollment to an all-time high of 2864 undergraduates. When you consider we only had 1702 undergraduates in the fall of 2000, this is remarkable growth. Good things do not only come in small packages as this class of freshmen had an average high school GPA of 3.85 and an average ACT of 27.1! Both of these are record-high scores.

Not surprisingly, these freshmen and many of our upper-classmen continue to achieve high academic standards. For example, I was pleased to learn this past fall that 475 of our 2864 undergraduates were named to the Dean's List. Such a designation indicates that these students took at least 12 graded hours and achieved at least a 3.75 GPA. Now I know, some of you alumni are thinking, "Alas, grade inflation has hit the Plains." I don't think so; COSAM faculty "still have teeth" as their courses are very challenging. On campus, there is not a single one of our courses that is regarded as an easy A. As always, COSAM students have been the recipients of numerous academic accolades both on and off campus. Of course, Jordan Anderson's being named a Rhodes Scholar was the highlight of all of these honorifics. See page 18 for the complete story.

This past year marked the 10th anniversary of the COSAM Leaders, the student hosts and hostesses of our college. For those of you who were at Auburn before the advent of the Leaders, this group of carefully selected and talented students represent the college in a number of varied settings. Since there are only 16 of them, the group always grows close to one another. This past November we had a 10-year reunion when about 1/2 of the 117 individuals who have served as Leaders returned to the Plains. It was a great time of reminiscing as well as meeting their spouses and their toddling future COSAM students.

This year we are currently supporting 427 students on some sort of COSAM scholarship. For those of you who have helped make this possible, I thank you. There is no way we can compete for the students we desire without a strong scholarship base. I would be somewhat disingenuous if I did not tell you that this number is somewhat less than the year before. Sadly, in a year of numerical growth and scholastic improvement, we had to award fewer scholarships. This, of course, was due to the decay in the value of our endowments as well as the loss of revenue in our operating budgets. These are hard economic times, but we would appreciate any and all you can do to continue the progress we have made in attracting academically talented students to COSAM.

I hope that catches you up on what has been going on with COSAM students. If you are ever around campus, please do stop by my office to say hello. In the meantime, do not hesitate to send me an e-mail at witlawr@auburn.edu. I would love to learn of what has been going on in your life. I can hardly wait to hear from you!

Lawrence C. Wit



Group photo of the 10-year COSAM Leader reunion.



Dr. Wit visits with former COSAM Leader Kacie Jackson and her fiancé Stuart Saulters at the 10-year reunion.

A MESSAGE

FROM THE ASSOCIATE DEAN OF DIVERSITY

VELMA B. RICHARDSON



The year 2009 was an exceptionally rewarding time for the Diversity staff and minority students enrolled in COSAM. We staged the 13th Annual Summer Bridge Program (SBP), adopted a more personalized approach to recruitment and implemented an array of retention strategies. Improvements in second-year retention rates for SBP alums were noted as well as increases in minority student involvement and leadership in campus-based organizations.

Summer Bridge Program



Since its inception in 1997, COSAM's Summer Bridge Program has provided transformative experiences for minority pre-freshmen, and the 2009 class was no exception. Although many of the 24 pre-freshmen were graduates of under-served and under-resourced schools and/or first-generation college students, they were diligent in completing their assignments, worked to acquire and fine-tune time management and leadership skills, embraced service learning and had fun as they explored the AU campus. We were honored to have Dr. James Daniel, M.D. (Chemistry, '78) as our Awards Luncheon speaker. Dr. Daniel shared inspirational moments from his life and challenged

SBP participants to strive to achieve their highest potential. We are exceedingly grateful to Dr. James and Mrs. Patricia Daniel (Pharmaceutical Science, '78) for their support.

Minority Student Recruitment

This year, in addition to hosting COSAM's Annual Fall Minority High School Visitation Day, we staged our first Recruitment Phone-A-Thon in March. This recruitment strategy was designed not only to attract minority students to COSAM, but also to enhance the leadership skills of currently enrolled minority students by providing an opportunity for them to become personally involved in the recruitment process. Due to these efforts, we are delighted to report the enrollment of a SBP cohort with the highest average ACT score (23.2) to date.

Student Achievement and Campus Involvement



In terms of the number of minority students recognized as outstanding academic achievers, the year 2009 was amazing. Approximately, 33.3 percent of the COSAM African American graduates were SBP alums and five graduates had already been accepted by a professional school or graduate program at the time of graduation. An impressive number of minority students attained a level of scholarship to be included on honor rolls, to qualify for membership in honor societies and/or to receive commendations at the 2009 COSAM Honors Convocation.

Other students engaged in faculty-mentored undergraduate research, served in major leadership positions on campus and/or participated in other extracurricular activities. We congratulate all of our students and wish for them continued fulfillment and success.

Diversity Welcomes Graduate Intern

In August we extended a warm welcome to Kimberly Mills, a graduate intern from the Department of Counseling Education in the School of Education, to our staff. Kimberly, an energetic, highly trained and experienced licensed counseling professional, is a doctoral candidate in counseling education at Auburn. She demonstrates an exceptional capacity to relate to students as she provides counseling, advisement and social support. We are certain that these skills and more will be required as we seek to find ways to better serve and assist students who encounter hardships and struggles as they advance in COSAM.

As I prepare this communication, I see a COSAM Leader walking across the green space between Parker Hall and the Sciences Center Classroom Building. He is such a poised and self-confident young man that I find it hard to remember the pre-freshman I welcomed to Auburn a few summers ago. It is incredulous but true that after more than 20 years in higher education, I am still in awe of the maturation processes that occur in students during their tenure in the university setting. Although each experience is unique, working with students as they undergo these transformations is immensely rewarding. I consider it a great privilege to be a part of this wonderful life-affirming process.

A handwritten signature in black ink that reads "Velma B. Richardson". The signature is fluid and cursive, with a large, stylized 'V' at the beginning.

Velma B. Richardson

2009-2010 COSAM LEADERS

The COSAM Leaders are an exemplary group of students who serve the college as its official ambassadors.

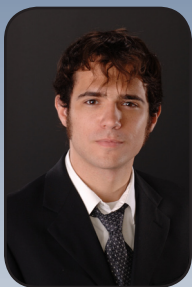
Back row from left: Jordan Taylor, Ben Samuelson, Cullen Johnson, Michael Cousar-Narcisse, Bhaven Sayania, Matt Bassett, Matt McDonald, A.J. Burandt

Front row from left: Sharon Lim, Dana Woods, Courtney Blythe, LaDaria Hartley, Sarah Bragg, Linnea Pepper, Lindsay Harris, Hannah O'Mary



2010 Dean's Medalists

The Dean's Medalists are outstanding graduating seniors in each department.



Top row from left: Joseph R. Chaffee (Mathematics & Statistics, Huntsville, Ala.), Jacob D. Daughhetee (Physics, Birmingham, Ala.), Kara J. Denby (Biological Sciences, Simi Valley, Calif.)



Middle row from left: Kristen L. Eppinett (Biological Sciences, Madison, Ala.), Kristen M. Hastrup (Biomedical Sciences, Fresno, Calif.), Anne-Marie C. Hodge (Biological Sciences, Chattanooga, Tenn.)



Bottom row from left: Rohan H. Kambeyanda (Biomedical Sciences, Huntsville, Ala.), Matthew R. McDonald (Chemistry & Biochemistry, Huntsville, Ala.), Jordan-Leigh Taylor (Geology & Geography, Huntsville, Ala.)

COSAM FACULTY RECEIVE AUBURN UNIVERSITY AWARDS

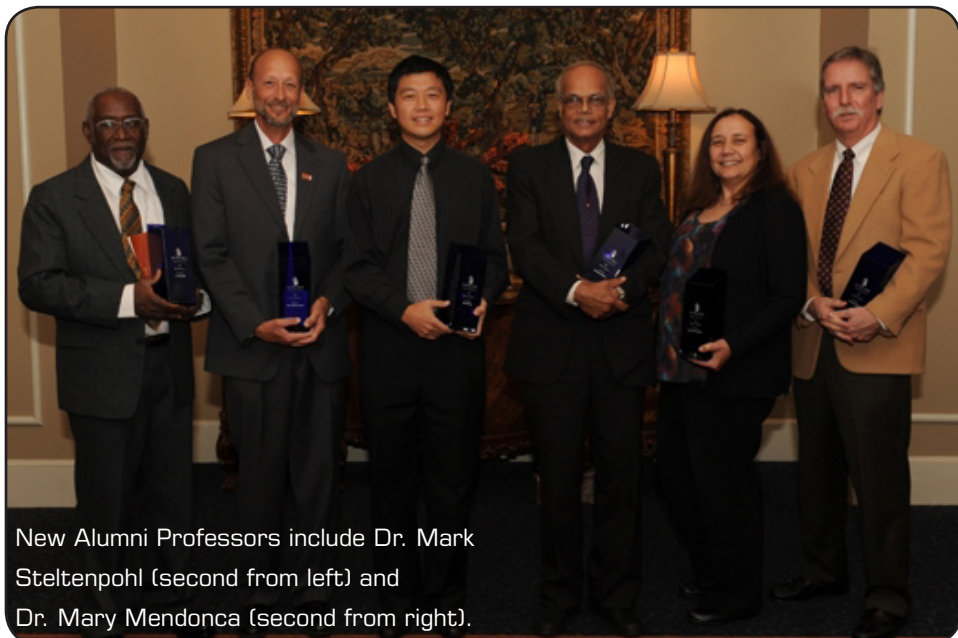
Two COSAM professors received recognition at the Auburn University Faculty Awards ceremony on Tuesday, Oct. 27, recognizing excellence in teaching, research and outreach.

Dr. Mary Mendonca, Biological Sciences professor, was one of the two recipients of the University's highest teaching honors, The Gerald and Emily Leischuck Endowed Presidential Awards.

Also during the ceremony, Auburn awarded the 2009 alumni professorships including Dr. Mendonca and Dr. Mark Steltenpohl, a professor in Geology and Geography.



Pictured with Gerald (far left) and Emily (far right) Leischuck is award winner Dr. Mary Mendonca (second from right).



New Alumni Professors include Dr. Mark Steltenpohl (second from left) and Dr. Mary Mendonca (second from right).

COSAM STUDENT HIGHLIGHT

Auburn senior gymnast Krissy Voss has been named one of two 2009-2010 Brad Davis Southeastern Conference Community Services Leaders of the Year, Commissioner Mike Slive has announced. A chemistry major, Voss is a three-time member of the SEC Academic Honor Roll and has been named for the last three years as a National Association of Collegiate Gymnastics Coaches Women's Scholastic All-American and member of the National Society of Collegiate Scholars.

"I am honored to receive this award," says Voss. "I know all the other nominees are incredible individuals because the Southeastern Conference inspires excellence of character and integrity. This award is a true testament of the values of Auburn University, my parents, coaches and all the caring individuals that have shaped me into the person that I am today. I am appreciative of this award because it thanks and honors them as well."

Courtesy Auburn Athletics and the Southeastern Conference



"I am honored to receive this award."

-Krissy Voss

COSAM DEAN STEWART SCHNELLER STEPS DOWN

LEGACY REFLECTED IN SUCCESS OF STUDENTS AND FACULTY

With the decision of Dr. Stewart (Stew) Schneller to step down as Dean of the College of Sciences and Mathematics (COSAM), *Journey* magazine sat down with him to review his term at the helm of one of Auburn University's fastest growing and most decorated colleges. COSAM, created as a college at Auburn in 1986, has benefitted from Schneller's leadership for almost 17 of its 24-year existence.

Journey: You frequently reference the words of Sir Isaac Newton, "If I have seen further, it is by standing on the shoulders of Giants." Are there past or present COSAM giants that provided you an opportunity to see further?

Dean Schneller: Shortly after arriving at Auburn it became apparent that the highly regarded reputation of the University and its basic sciences and mathematics was the result of those who had come before me — faculty, staff, students and alumni. It is this foundation, upon which I stand with my colleagues, that enabled me to

extend the success of the College. The Giants on whose shoulders we stand are numerous, but a look at an early presidential staff (below/left) gives some indication of where it started: Dr. Otis D. Smith, professor of mathematics, Dr. William Leroy Broun, Auburn University president and professor of physics and astronomy, Dr. Patrick Mell, professor of botany and geology, Dr. J.M. Stedman, professor of biology, and Bennett Battle Ross professor of



1993, THE BEGINNING OF AN ERA:

SOUTH FLORIDA CHEMISTRY PROFESSOR, DR. STEWART W. SCHNELLER BECOMES DEAN. COSAM OFFICES ARE LOCATED IN THE EXTENSION COTTAGE.



Launch of
Science in
Motion

1994

1995



Inaugural
Honors
Convocation
recognizes
outstanding
students

1997

COSAM
ambassadors
established with
the launch of
"Leaders"



2000

1993

COSAM
logo
designed



Inaugural Dean's Scholarship
Golf Tournament S. Blk Auburn

1996

Auburn Family Campaign
(capital campaign)



COSAM becomes
a leader in
Auburn
University's
diversity initiatives
with launch of

1999

First
edition
of
Journey



chemistry. These giants were later followed by Auburn football stadium namesake Cliff Hare, who was dean of chemistry for 50 years. The University has a significant foundation established by scientists and mathematicians.

Journey: Through a creative branding campaign, the acronym "COSAM" is now part of the Auburn University lexicon. Why is that important?

Dean Schneller: The fortunate placements of vowels provided by the College's title gave rise to a convenient verbal handle by which we could achieve recognition while stressing our mission — a collage of sciences and mathematics in all CAPS.

Journey: Quality faculty are at the center of any great university. While it would be difficult to acknowledge all the talented members of the faculty in COSAM, can you speak collectively of the group?

Dean Schneller: Without a doubt, the reputation of a college begins with the achievements of its faculty. Within COSAM our faculty have recently been recognized with three Leischuck awards for teaching, the University's outreach award, a national mentoring award, and sizeable research grants for their scholarly investigations. In a symbiotic fashion, highly regarded faculty with a passion for their discipline attract outstanding students. This latter point allows for a metric of the quality of COSAM's faculty: COSAM students have consistently been USA Today scholars, acknowledged as Gates and Goldwater scholars and, most recently, a Rhodes Scholar. Also, they have been the scholar-athlete of the year in the SEC, the top Phi Kappa Phi graduating senior and Samford scholars.

Journey: Extending science and mathematics to the Alabama community through outreach efforts has been a priority for COSAM. Does the boundless energy and enthusiasm you witness in the variety of camps and events sponsored by COSAM provide you with a sense that Auburn is introducing sciences and mathematics to primary and secondary students at a crucial age.

Dean Schneller: In the late 1990s, when setting COSAM's strategic plan for the first decade of the 21st century, we sought to adapt our attributes to the University's traditional extension



2001, CHANGE COMES FOR COSAM:

COSAM OFFICES MOVE TO O.D. SMITH HALL.

AU converts to semesters

2000



Society of Health Professionals connects COSAM alums



USA Today All American Cyndee Carver



USA Today All American Juan Carmona



Time Capsule placed in new building, to be opened in 2056

2002



BEST Program

2003



Ground breaking for new

2004



David Hagan named

Departments of Biological Sciences and Geology & Geography formed. Parents Society Established

2001

"I LOOK FORWARD TO GIVING BACK TO AUBURN UNIVERSITY IN SOME WAY IN APPRECIATION FOR WHAT AUBURN HAS ALLOWED ME TO DO AS DEAN OF COSAM."

-DEAN STEWART SCHNELLER

mission by moving to K-12 science and mathematics outreach to value add to the educational objectives of that academic community. An outreach director, Mary Lou Ewald, was hired, and through her work (and early guidance by Professor Marllin Simon), the College's outreach efforts now touch more than 12,000 K-12 students and teachers each year. In addition to these COSAM - sponsored programs are the state-supported Science-in-Motion and the Alabama Mathematics, Science and Technology Initiative in which COSAM is an active participant. The Alabama Science Teachers Association recently recognized COSAM for its efforts.

Journey: COSAM's diversity efforts have paid dividends in terms of recruitment and retention of minority students. Additionally, COSAM's diversity model is now being implemented on a University-wide level. To what do you attribute COSAM's success in promoting diversity?

Dean Schneller: This question is easy to answer: the leadership of Dr. Overtoun Jenda who served as

COSAM's associate dean for diversity for six years. Dr. Jenda is now the associate provost for diversity and multicultural affairs and the University is benefitting from his commitment to improving the educational opportunities for students from previously less represented groups. COSAM's commitment to this endeavor continues under Associate Dean Dr. Velma Richardson.

Journey: COSAM's extramural funding recently surpassed \$12 million for 2009. What role have you seen research play in the fulfillment of COSAM's mission?

Dean Schneller: One component of COSAM's mission statement establishes "the creation of new knowledge," which represents our commitment to research as a priority. This challenge is being fulfilled as a result of the passion our faculty have for following their creative curiosities. Working in collaboration with students (graduate and undergraduate) faculty have produced internationally acclaimed results that have led to peer-reviewed publications and federally funded grants. Competition for the latter is significant. Over the last 10 years, Dr. Marie Wooten has led COSAM's efforts as our associate dean for research.

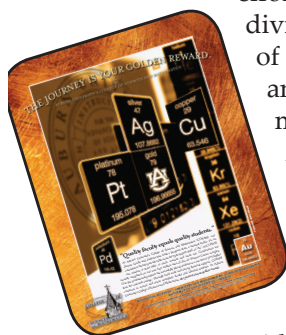
Journey: COSAM students have garnered numerous awards and recognitions both on and off campus. They also have placement rates in

professional schools well above the national average. What factors contribute to the success of COSAM students?

Dean Schneller: For sure, this can be traced to the tireless commitment of our faculty to student success, which is reinforced by the desire of our students to succeed. In this regard, I do want to acknowledge Dr. Larry Wit, associate dean for academic affairs in COSAM, for his role in setting the agenda and promoting its fulfillment towards achievement for COSAM students.

Journey: As Dean, with which COSAM achievements are you most satisfied?

Dean Schneller: Certainly, the quality of our students, the research achievements of our faculty, the immense impact of our K-12 outreach programs and our campus leadership in student diversity come to mind. In addition, I am pleased with the new Sciences Center buildings, the recent approval for a biodiversity learning center, and recognition of the need to replace Parker Hall by the University's Board of Trustees. It has been rewarding



2005, COSAM SAYS GOODBYE TO THE OLD AND WELCOMES THE NEW:

DEAN SCHNELLER COMPLETES CONSTRUCTION OF THE SCIENCES CENTER COMPLEX.



USA Today
All American
Leslie McCall



Society of Women in
Sciences and Mathematics
established

2006

2007

2004

Department of
Mathematics &
Statistics formed.



USA Today
All American
Joshua Jarrell

2005



Saunders
Hall
dedicated



Alum John
Oakberg member



Ralph Jordan at the



Rural Pre-
Medicine
program begins

seeing the commitment of the faculty following the blending of disciplines into the Department of Biological Sciences, the Department of Mathematics and Statistics, and the Department of Geology and Geography and the renaming of the Department of Chemistry as the Department of Chemistry and Biochemistry. I have been overwhelmed by the commitment of our alumni and friends who share in our vision for sciences and mathematics at Auburn and beyond. I am particularly pleased with our "AU Gold," "Imagination," "Standing on the Shoulders of Giants" and "COSAM was Here" public awareness efforts.

Journey: You've spoken about many of COSAM's accomplishments during your tenure as Dean. In what areas do you feel the college could have made more progress?

Dean Schneller: I have been disappointed with the lack of a fully funded, traditional sabbatical-leave program, a start-up fund for new faculty that is consistently dependable, competitive graduate student stipends, and sustained improvement in faculty and staff salaries.

Journey: While you will still be involved with COSAM as a tenured faculty member in the Department of Chemistry and Biochemistry, what will you miss most about leaving your post as Dean?

Dean Schneller: My wonderfully dedicated staff, regular contact with alums and friends of the College, stimulating discussions with the Dean's Council and faculty on issues that affect the College and University, interactions with my dean colleagues, and the rewards of, in some way, enhancing the careers of students, faculty and those who provide the infrastructure upon which the College depends.

Journey: COSAM is approaching its 25th year at Auburn University. What, in your opinion, are the greatest opportunities for COSAM's advancement?

Dean Schneller: Graduate program development, interdisciplinary research, new facilities including a mathematics learning center, retaining its quality undergraduate student population, a new capital campaign, and acknowledging the role of faculty in moving COSAM forward.

Journey: What are your future plans, both on campus and in your personal life?

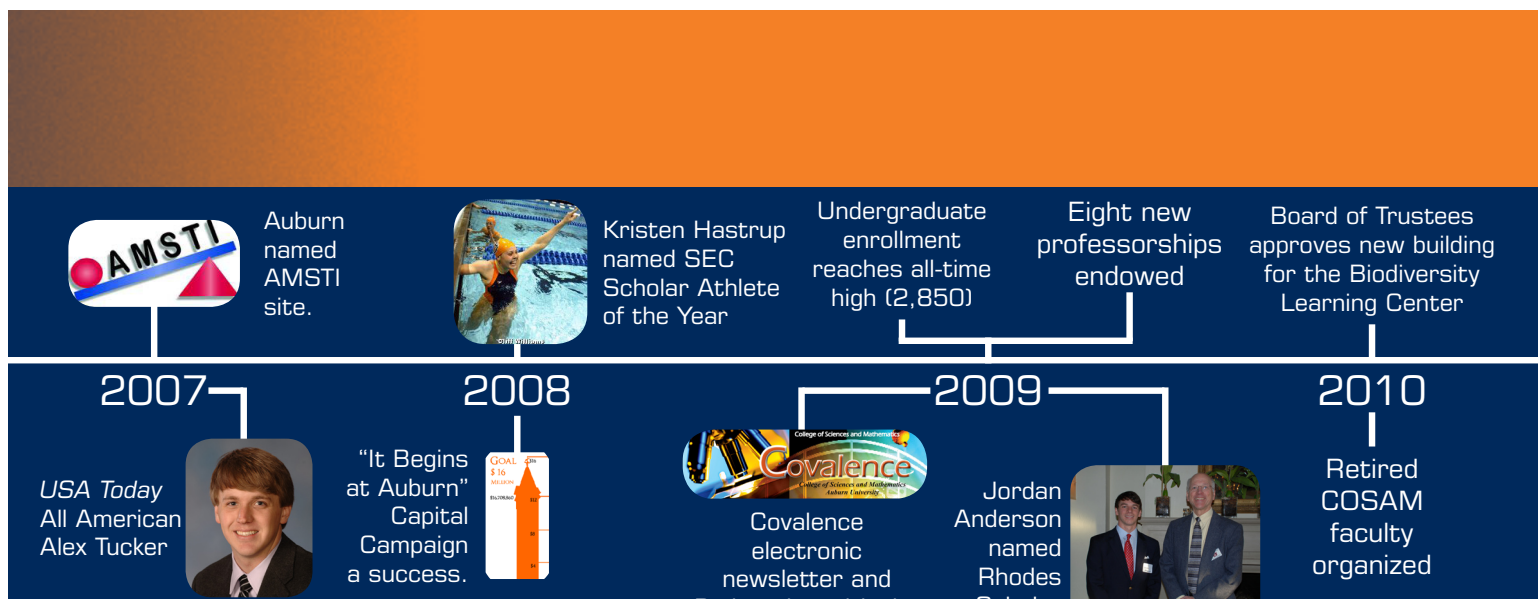
Dean Schneller: I began my academic career as a professor of chemistry and biochemistry (elsewhere) and will now return "home" to that department here. I have some ideas I want to call upon in classroom teaching. Also, I am excited about a more day-to-day interaction with my research postdoctoral associates and Ph.D. students. We have research papers and patents to write and grant proposals to prepare. I recently began collaboration with Microbiotix, Inc. in Worcester, Mass. that requires my attention, and I will seek a Fulbright or a von Humboldt fellowship. The bottom line is, I look forward to giving back to Auburn University in some way in appreciation for what Auburn has allowed me to do as Dean of COSAM.

During his tenure as Dean, Dr. Stewart Schneller initiated a public awareness effort through a series of promotional materials that appeared in publications around the University. Themes included: "AU Gold," "Imagination," "Standing on the Shoulders of Giants" and "COSAM was Here."



Journey: You do not hold a degree from Auburn University. After 17 years as Dean of the College of Sciences and Mathematics, do you consider yourself an Auburn Tiger?

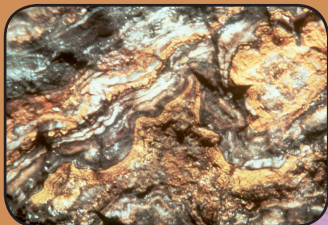
Dean Schneller: Being surrounded by the Auburn spirit and immersed in the COSAM culture, it is impossible not to take on the coveted attributes of an Auburn Tiger.



Geology & Geography

Mantle Plumes, Hotspots, and Gold Ores

A mantle plume is a place where upwelling hot mantle causes melting of "solid" rock in the upper mantle or base of the Earth's crust. A "hotspot" is a place at the Earth's surface where the magmas vent to make large volcanoes. Yellowstone Park, the "Big Island" of Hawaii, and Iceland are current locations of such hotspots. However, 16 million years ago the Yellowstone Hotspot initially emerged near the present-day location of the junction of the states of Oregon, Idaho and Nevada. It triggered widespread volcanic activity in the region, including the formation of so-called super-volcanoes. Research by **Dr. James Saunders** and **Dr. Willis Hames** demonstrates that the initial emergence of the Yellowstone Hotspot also led to the formation of "bonanza" deposits of gold and silver during a relatively short interval of geologic time (1 to 2 million years). Such gold deposits do not occur in Hawaii or Iceland, nor did they continue to be formed by the Yellowstone Hotspot. Grants to Saunders and Hames from the U.S. Geological Survey and the National Science Foundation are supporting their research on these ores and their relation to the Yellowstone Hotspot. Current research efforts by Saunders, Hames, and Auburn students are focused on the historic Silver City district of S.W. Idaho (on War Eagle Mountain!!). Results could lead to discovery of more gold deposits in the western U.S. (the U.S. is currently the fifth-largest producer of gold in the world, and a number of Auburn Geology alumni work in Nevada in this industry) and perhaps in other areas of the world with similar geologic histories.



(above) High-grade gold ore from Nevada (field of view is 10 cm) and (right) sample of bonanza gold ore.



Chuck Savrda
Department Chairman

Department Highlights

The Robert B. Cook Endowed Professorship, the first of its kind in the Department of Geology and Geography, was established with gifts from dedicated alumni and other friends, and with matching support from Auburn's central administration. The Professorship honors **Dr. Bob Cook**, who in his 35 years of service and leadership at Auburn University established a reputation for excellence in undergraduate and graduate instruction, research, and service that centered on minerals, resources and other facets of economic geology.

Dr. Mark Steltenpohl was awarded one of Auburn University's Alumni Professorships, which recognize outstanding and exceptional contributions to the University's academic programs. Dr. Steltenpohl and his students continue geologic mapping in the Scandinavian Caledonides and the southern Appalachians. Regarding work in the latter area, Dr. Steltenpohl is enjoying his 14th year of continuous funding from the USGS EdMap Program.

Both **Dr. Steltenpohl** and **Dr. Ashraf Uddin** were among only five faculty members throughout the University selected to receive 2008-09 Outstanding Graduate Mentor Awards from the Graduate Student Council.

Dr. David King has been named as the program director for Concepts of Science, COSAM's interdisciplinary core-science elective class. He will balance these new administrative duties with ongoing NASA-supported studies of impact structures, which this year included the completion of four new scientific core holes at the crater site in Wetumpka, Ala.

Dr. Ming-Kuo Lee and **Dr. Luke Marzen** are members of a multidisciplinary COSAM team working on a NASA-funded outreach project designed to bring climate-change education to Alabama classrooms.

Dr. Lorraine Wolf is spending part of the academic year on sabbatical leave in the Department of Earth and Space Sciences at the University of Washington. Hosted by **Dr. Joan Gomberg**, Dr. Wolf is pursuing new research avenues, including the relationships between seismicity, hydrological phenomena, and climate change.

The department formally implemented its new masters program in Geography in January 2010 with the enrollment of five degree candidates. Program implementation coincides with the relocation of geography faculty and students to more spacious facilities in Haley Center.

Dr. Josh Inwood is the recent recipient of a \$170 million three-year National Science Foundation (NSF) grant to explore the results of the Truth and Reconciliation Commission held in Greensboro, N. C. This research focuses on the ways that grassroots activists address the legacy and memory of racial violence. Along with Auburn's Multicultural Center, Dr. Inwood helped bring nationally recognized independent filmmaker **Andy Coon** to campus to discuss his award-winning film on the subject, *Greensboro's Child*.

Dr. Ashraf Uddin and **Dr. Bill Hames** were recently awarded a \$300 million grant from the Tectonics Program of NSF for a three-year project to study Pennsylvanian orogenic sediments deposited in the Black Warrior and Cahaba basins of Alabama. **Dr. Uddin** is also collaborating with **Dr. Shams**

Shaheen, a visiting scientist from Suez Canal University in Egypt, on studies of heavy minerals in Lake Manzala, a Nile Delta coastal lagoon. **Dr. Hames** received additional new NSF funding to explore relationships between ore mineralization and hotspot magmatism (with **Dr. James Saunders**; see sidebar) and to improve the Auburn Nobel Isotope Mass Analysis Laboratory (with **Dr. Andreas Illies**, Chemistry and Biochemistry).

Dr. Haibo Zou celebrated the second printing by Imperial College Press of his well-received book entitled *Quantitative Geochemistry*.

Department Highlights

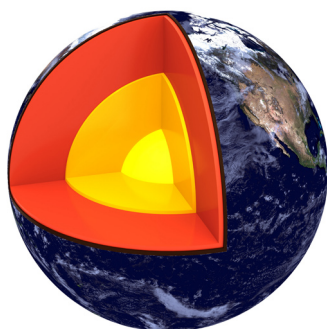


Joe Perez
Department Head

New Departmental Record in Extramural Funding

The Physics Department Faculty followed up a record-breaking \$4 million in extramural funding for Fiscal Year 2008 with \$5.3 million in Fiscal Year 2009, by far the most ever for the department. Thirteen of 20 tenure or tenure-track faculty were principal investigators for these grants. The grants were for fundamental research in plasma physics, atomic physics, condensed matter physics, and space physics, as well as outreach/service in K-12 education. Grants were received from: government agencies such as the National Science Foundation (NSF), U. S. Department of Energy, National Aeronautics and Space

Administration, Alabama Department of Education, and U.S. Department of Defense Army Research Laboratory; industries such as Dow Corning Corporation, Kyma Technologies Inc., and Southwest Research Institute; and joint projects with Princeton University, North Carolina State University, University of Alabama, Huntsville, and Vanderbilt University.



Outstanding Paper Published

Physics Department faculty publish more than 50 refereed publications per year. Many of these deserve special notice. Here we recognize one because it is published in a prestigious journal that is not one of those in which we usually publish.

Heat transfer from inside the hotter Earth's interior to its cooler surface is manifest in many near-surface phenomena, including volcanoes and earthquakes. Since studies of the Earth's deep interior require data at pressure-temperature (P-T) conditions not yet accessible by experiment, e.g. $T > 2300\text{K}$ and $P > 100\text{ GPa}$, most currently available models of thermal transport properties of minerals and rocks have large uncertainties and/or serious flaws. Recently, two Auburn solid-state physicists, **Dr. Xiaoli Tang** and **Dr. Jianjun Dong**, developed a first-principles numeric technique to predict the lattice thermal conductivity of Earth minerals at P-T conditions of the Earth's deep interior. Results of their recent study on lattice thermal conductivity of MgO at conditions of Earth's interior have been accepted for publication in



the *Proceedings of the National Academy of Sciences* (PNAS), one of the top multi-disciplinary science journals in the world.

This work is supported by a NSF grant awarded to Dr. Jianjun Dong. A portion of the numerical calculation was conducted with the COSAM PRISM computers. The theoretical work is also in collaboration with an experimental group led by Anne Hofmeister at Washington University at St Louis.

Atomic, Molecular, and Optical Physics Workshop Hosted

On Jan. 7 - 9, 2010, the atomic physics group hosted a workshop for atomic, molecular, and optical physicist from the U.S. and Europe. Twenty-five scientists held sessions on theoretical atomic physics calculations, astrophysics, and Bose-Einstein Condensates.

Physics

Fall 2009 Recruiting Class One of Best Ever

While the Auburn football team is celebrating a top five recruiting class, the Physics Department has something to celebrate, too. For the Fall 2009 semester, the Physics Department welcomed the largest class of freshmen Physics majors in more than 20 years. The students had an average high school grade point average of 3.96, an average ACT score of 31.6 and average SAT of 1268. While most are from Alabama, the highest GPA is from Florida, and the one who traveled the farthest is from Wisconsin. Six are double majors and three are future women scientists.

The incoming graduate class for Fall 2009 included 10 students, six domestic and four international. The domestic students were from Arizona, Georgia, Virginia, Kentucky, Tennessee and Alabama. Of special note is the fact that four were female, which is a high percentage in physics.

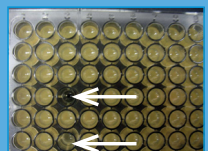
Biological Sciences

Environmental Genomics for Antibiotic Discovery

Dr. Mark Liles, together with the biotech company Lucigen of Middleton, Wis., was awarded a National Institutes of Health (NIH) grant to use environmental genomics for the discovery of antibiotics. Environmental genomics ("metagenomics") involves cloning DNA from an entire community of microorganisms. Many bacterial species in soils and other natural environments have not been cultured in the laboratory; therefore, by directly cloning DNA from microorganisms and using the bacterium *Escherichia coli* as the "factory" to produce any cloned antibiotic synthesis genes, novel antibiotics may be discovered.

The Liles laboratory had previously been awarded an NIH grant to characterize antibiotic-producing clones, discovered by screening soil metagenomic libraries for clones that inhibit growth of pathogenic bacteria (see figure). The ongoing research on these clones involves characterizing genetic pathways necessary for antibiotic synthesis, and biochemical structure of each antibiotic, the latter work conducted in collaboration with Dr. Paul Cobine.

The new grant takes advantage of three key technological innovations for the creation of the next-generation metagenomic library. First, extracting pure and very large DNA (1 million DNA base pairs) is critical, and Liles and colleagues have published an improved DNA extraction method for library construction. Second, the lab recently constructed a novel cloning vector allowing a metagenomic library to be expressed in other bacterial species, thereby increasing the likelihood an antibiotic is discovered. Last, the partnership with Lucigen will take advantage of their "Random Shear Cloning" technology that will enable construction of soil metagenomic libraries with larger DNA fragments than has been possible before. The primary goal of the NIH Phase I Small Business Innovation Research grant will be to construct the next-generation metagenomic library, which can then be applied in Phase II for identification of antibiotics against bacterial pathogens that are resistant to many antibiotics.



Antibiotic-producing library clones are present in wells shown by arrows.



Jack Feminella
Department Chairman

Department Highlights

Biological Sciences faculty made great strides in implementing four freshmen Learning Communities for Auburn students in 2009-2010, *EarthSmart* (Instructor **Dr. Sharon Roberts**), *Conservation Biology* (**Dr. Robert Boyd**), *Microbiology* (**Drs. James Barbaree, Paul Cobine, Kirby Farrington, Mark Liles, Sharon Roberts, Christine Sundermann, Laura Silo-Suh, San-Jin Suh, and Catherine McVay**), and *Marine Biology* (**Drs. Ken Halanych and Tony Moss**). **Dr. Mary Mendonça** was awarded the Gerald and Emily Leischuck Award for Teaching Excellence, joining former awardees **Drs. Robert Lishak and Roland Dute**. Mendonça also received an Alumni Professorship, joining **Drs. Ken Halanych and Jon Armbruster** as three of the 25 Alumni Professors at Auburn. **Dr. Michael Wooten** completed a Genetics Laboratory Manual, which was published by

Contemporary Publishing Company. All exercises are computer based, and web designed, using software tied to exercises Wooten designed over the past 10 years at Auburn. **Dr. Anthony Moss** traveled to Germany in July 2009 to conduct research with colleagues at the Christian Albrechts University and the Institute for Marine Research at University of Kiel. This work involves studying microbes associated with comb jellies (Ctenophores) in the US coastal environment and the North and Baltic seas.

Drs. Mark Liles and Paul Cobine were awarded an NIH grant for their research on antibiotic discovery. They discovered a technique allowing identification of antibiotic products produced in natural environments without growing certain organisms in the laboratory. **Dr. Geoffrey Hill** was awarded the NSF grant "Collaborative Research: Plumage Redness and Good Genes in the House Finch," in collaboration with Harvard colleagues, and will test theory regarding the role of sexual selection in the evolution of disease resistance. Hill also is the solo author of the book *National Geographic Bird Coloration*, a comprehensive overview of bird coloration written for general audiences. **Drs. Robert Locy and Narendra Singh** received the USDA grant "Establishment of a Cotton Small RNA Database Resource and the Development of Methods for Utilization in Breeding Heat and Drought Tolerance and Fiber Quality Traits in Cotton", which continues their research on genomics and influence on environmental stress tolerance in commercially important plants. **Drs. Ken Halanych, Kevin Fielman, and Scott Santos** were awarded an NSF grant to study symbioses between deep-sea bacteria and marine tubeworms. The project employs cutting-edge DNA sequencing and gene expression technologies to study mechanisms allowing these symbiotic relationships, and will be integral to elucidating how oceanic microbial associations have shaped animal biology and evolution. **Dr. Paul Cobine** and Entomology and Plant Pathology colleague Dr. Leonardo De La Fuente received a USDA-NIFA grant on the role of essential metals in establishment of infection by the plant pathogen *Xylella fastidiosa*. This pathogen infects commercially important crops such as grapes, almonds, blueberries and peaches.

Dr. Ken Halanych was recognized for his outstanding research by receiving the Dean's Research Award for 2010. **Drs. Geoff Hill and Mark Liles** both won Outstanding Graduate Mentor awards from the Graduate Student Council. **Anne-Marie Hodge**, an undergraduate zoology alumnus, was awarded an NSF Graduate Research Fellowship for her work in conservation biology at UNC Wilmington. Graduate student **Sean Graham** was awarded Dean's Research Award for Outstanding Ph.D. **Larissa Parsley** was awarded outstanding GTA in COSAM. **David Weese** was awarded an NSF-PSD Academic Excellence Scholarship East Asia & Pacific Institutes for U.S. Graduate Students programs, awarded by the NSF-like Japan Society for the Promotion of Science. **Jessica Stephens** and **Amy Skibiell** both won Sigma Xi Grants-in Aid, and **Jessica Stephens** also was awarded an NERRS Graduate Research Fellowship. **Lynn Gilley** was awarded Best Student Presentation at the 2010 Colloquium on Conservation of Mammals in Southeastern US in Asheville, NC, and was a keynote speaker at 2010 National Flying Squirrel Association conference Andalusia, AL. **Shanna Hanes** was awarded the Ruska Award outstanding student presentation in microscopy by Southeastern Microscopy. **Evi Paemelaere** was recognized as one of the 10 outstanding Auburn doctoral students, and **Matthew Dodson** won the complementary award for outstanding master's student. The following students were recognized for their departmental achievements, **Erin Donovan** (Outstanding Service), **Evi Paemelaere** (Outstanding GTA), **Amy Skibiell** (Margaret McNeal Arant Award for Outstanding Graduate Student), and **Mark Liu** (Kenneth Otis Award).

Department Highlights



Vincent Ortiz
Department Chairman

Two members of the faculty, **Drs. S. D. Worley** and **Andreas Illies**, retired from the Auburn faculty after 35 and 25 years, respectively, of distinguished teaching, research and service. Our Laboratory Manager for Biochemistry, **Ms. Brenda Carrington**, also retired.

The department's new Laboratory Manager for Analytical, Physical and Inorganic undergraduate courses is **Dr. Dan Philen**, an Auburn alumnus. Dr. Philen retired from the former Bell Laboratories, one of the most distinguished private-sector research organizations in recent history, as a Distinguished Member of the Technical Staff and has subsequently taught at Emory University.

The Mass Spectrometry Laboratory has a new Director, **Dr. Yonnie Wu**, formerly of Clemson University. Dr. Wu has extensive experience in the application of mass spectrometry to problems at the interface of chemical and biological sciences.

The Nuclear Magnetic Resonance Laboratory has a new Director, **Dr. Michael Meadows**, who recently retired from Eastman Chemical. Dr. Meadows has many years of experience in the use of NMR techniques in polymer, organic and inorganic chemistry.

Mr. Duane Leinhos was hired in January 2010 as the new biochemistry lab manager. Previous to working at Auburn, Leinhos worked at Tate & Lyle where he was instrumental in developing and improving the sucralose (Splenda® brand) manufacturing process.

A new instructor, **Dr. Robin Sibert**, joined the department and will teach introductory courses in general chemistry. Dr. Sibert recently obtained her doctorate at Georgia Tech.

Dr. Orlando Acevedo, assistant professor, was elected President of the Auburn Section of the American Chemical Society.

Dr. Christian Goldsmith, assistant professor, has received a New Investigator grant from the American Chemical Society's Petroleum Research Fund for his proposal entitled, "Halogenation of Petroleum-Based Hydrocarbon Substrates by First-Row Transition Metal Ion Complexes." (See page 32 for more information.)

An article by **Dr. Acevedo** and his graduate student **S. V. Sambasivarao** was featured on the cover of the *Journal of Chemical Theory and Computation*, a publication of the American Chemical Society.

Two recent papers co-authored by **Dr. Christopher Easley**, assistant professor, have been highlighted in prestigious journals. One paper, published in *Nature Physics*, was featured as Editors' Choice in *Science*. A second paper, published in the latter journal, has been highlighted by *Nature Methods*.

Water disinfection beads from HaloSource, a company based in Bothell, Wash., have been cleared for manufacture and sale by the Environmental Protection Agency in the United States. This technology is licensed from Auburn University and is based on research performed by **Dr. S. D. Worley**. This decision is likely to stimulate government approval in developing countries, where the availability of potable water

is often a widespread problem of public health.

Joe McDonald, a member of the staff in the Scientific Supply Store, has been honored by President Gogue with a Spirit of Excellence Award for outstanding performance of his duties.



New faces in the department of Chemistry include from left: Director of the Mass Spectrometry Lab, Dr. Yonnie Wu, Managers of Laboratory Teaching, Mr. Duane Leinhos and Dr. Dan Philen, Chemistry Instructor, Dr. Robin Sibert, and Director of the Nuclear Magnetic Resonance Laboratory, Dr. Michael Meadows.

Chemistry & Biochemistry

Student Chapter of the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers Comes to Auburn



The Department of Chemistry and Biochemistry and the Department of Chemical Engineering have entered into a three-year Technology Education Partnership (TEP) with the National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE). For over 30 years, NOBCCChE has been an instrument of diversity and of scientific and professional achievement in the chemical sciences. Its educational, scientific and outreach activities involve all generations and sustain a community of opportunity that recognizes and develops talent. Auburn University and NOBCCChE will collaborate on recruiting and retaining young scientists and engineers for undergraduate and graduate degree programs, increasing awareness of the chemical sciences, especially among the young, and facilitating the scientific and professional development of students and faculty. A new, student chapter of NOBCCChE at Auburn University has been started and is advised by Chairman of the Department of Chemistry and Biochemistry, **Dr. Vincent Ortiz**.

Mathematics & Statistics

**Auburn University
Mathematics Partners
With African University of
Science and Technology**



The Auburn University - African University of Science and Technology (AUST) partnership was initiated in Fall 2008. AUST is a private, pan-African, coeducational, research university located in Abuja, Nigeria. A memorandum of understanding signed between Auburn and AUST allows us to partner in educational and research activities such as faculty and student exchange, joint research programs, special short-term academic programs, and organization of international conferences and workshops. This year we recruited the first group of three graduate students from our cooperative arrangement supported by the World Bank with the AUST. The students were recruited from across the African continent. Our first group is Seth Kwame Kermausuor from Ghana, Eze Raymond Nwaeze from Nigeria, and Dawit Gazahegn Tadesse from Ethiopia. For more information on this partnership, visit the Web site at:

<http://math.auburn.edu/auaust.htm>



Michel Smith
Department Chairman

In addition to numerous research papers in international journals, **Dr. Yongsheng Han** published his book, *Harmonic Analysis on Spaces of Homogeneous Type*, co-authored with Donggao Deng. Also, the second edition of the popular textbook, *Design Theory*, by **Drs. Curt Lindner** and **Chris Rodger** was published.

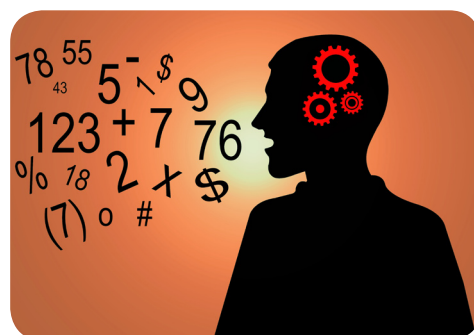
Several new grants have been awarded. Of particular interest in this area is the collaborative research project, Alabama Alliance for Students with Disabilities in Science, Technology, Engineering, and Mathematics (AASD-STEM).

AASD-STEM is supported by a major National Science Foundation grant and is a collaborative effort involving Auburn University, Tuskegee University, Alabama State University, Auburn University at Montgomery, Central Alabama Community College, Southern Union State Community College, the Alabama Institute for the Deaf and Blind, and six school districts in east-central Alabama: Lee, Chambers, Elmore, Montgomery, Macon, and Tallapoosa County school systems. The Alliance has four major goals: to increase the quality of students with disabilities completing associate and baccalaureate degrees in Science, Technology, Engineering, and Mathematics (STEM) disciplines; to increase the number of students with disabilities completing associate and baccalaureate degrees in STEM disciplines and entering STEM graduate degrees or STEM workforce; to increase the number of students with disabilities completing graduate degrees in STEM Disciplines; and to increase the number of high school students with disabilities going to college. This unique alliance between educational institutions builds upon established STEM bridge programs to include female and minority students with disabilities. The Alabama Alliance has an internal evaluation team and an external evaluator who will lead the independent formative and summative project evaluations. **Dr. Overton Jenda**, associate provost for Diversity and Multicultural Affairs at Auburn University is the principal investigator and project director. **Dr. Ash Abebe** of COSAM's Department of Mathematics and Statistics, along with six others from both Auburn and other participating schools, is co-principal investigator. For more information on AASD-STEM, visit the Web site:

<https://fp.auburn.edu/diversity/stem.aspx>

Department Highlights

Faculty members in the department continue to receive prestigious invitations to present research work at international conferences and colloquia. This year our faculty have visited China, Brazil, Australia, Spain, Germany, France, Hungary, Mexico and Canada, to mention a few.





Mary Lou Ewald
Director of Outreach

Outreach is fundamental to the land-grant mission of Auburn University and COSAM's commitment to building a better future for all. Through our outreach efforts, we work toward improving the learning opportunities and the futures of citizens in Alabama, the Southeast region, the nation, and the global community. This year marks the 10th anniversary of COSAM's Outreach Office and I have had the privilege of serving as Director of this unit since its inception. Through the vision of Dean Schneller and the hard work and creativity of COSAM faculty, students, and outreach specialists, we have established a unit like none other on Auburn's campus. Over the past 10 years, COSAM Outreach has impacted over 75,000 students, teachers, school administrators, and parents through our many on-campus workshops, conferences, and programs (BEST, YES camps, AU Explore, Science Olympiad, GUTS, and more), with countless more being impacted daily through off-campus programs such as Science in Motion and the Alabama Math, Science and Technology Initiative.

Why is outreach important and does it actually work in attracting young students to STEM (Science, Technology, Engineering, and Math) careers, you might ask. K-12 outreach is a long-term commitment. We cannot always see the immediate impact of our efforts. Yet if we forge ahead and continue to implement research-based educational initiatives that are exciting and enriching for young students, we are confident that the seeds will be planted for "growing" a future citizenry that is more science literate and better appreciates the importance of science and math in day-to-day living and decision making. An added bonus of our efforts is that of inspiring students to become future scientists. This year, instead of highlighting a particular outreach program, we introduce one young man who discovered his future in science through participation in several of our outreach initiatives during his high school years. As I remind myself on a regular basis, it's not about the "program" - it's about each person who participates in the program. Nicholas Christensen is the reason we do what we do!

WHAT CAN COSAM OUTREACH DO FOR YOU?

BY: CANDIS HACKER BIRCHFIELD

Nicholas Christensen, a COSAM Outreach Success Story



Nicholas Christensen, a senior at Wetumpka High School in Wetumpka, Ala., has been involved in COSAM's outreach efforts for several years, including the BEST (Boosting Engineering Science and Technology) Robotics Competition. This year, as the Business Captain for Wetumpka High School's BEST team, Christensen led the group to a first-place finish in the local War Eagle BEST competition as well as at the regional South's BEST competition. In April 2010, the team will travel to Dallas, Texas to compete on a national scale.

"As Team Captain, I am in charge of the business side of our team. I manage the team spirit, Project Engineering Notebook, table display, Website, and oral presentation. Before I was involved in BEST, I wasn't really a social person," says Christensen who points to his high-frequency hearing loss as an example of why he found socializing difficult. "Now, because of BEST, I am social. I like being around like-minded people who are interested in science and technology. I guess we are 'nerds,' so to speak, but we carry that name proudly."

Although Christensen's hearing loss once deterred him from seeking social situations, he does recognize that there are blessings associated with his disability. For example, it is because of his hearing loss that he developed an award-winning science project that he presented at COSAM's outreach event, the Intel Science and Engineering Fair, in 2009. For the Fair, Christensen created a new type of hearing aid that helps people like him who have high-frequency hearing loss. He even has a patent pending on his new device.

"Last year was the first time I presented my project at the Auburn Intel Science and Engineering Fair, and I won the Greater East Alabama Region," says Christensen. "Winning the region propelled me to the Intel International Competition in Reno, Nev., where I won second place in the computer science division. I was competing against over 1,500 projects from all over the world, and that number had been narrowed down from the starting number of over 2 million projects."

Because of his second-place win in the International Intel Science Fair, Christensen was chosen as one of 40 Intel Science Talent Search finalists in the U.S., and he had the opportunity to travel to Washington D.C. where he met some of the most influential scientific and technological minds in the country.

While COSAM's outreach events have offered Christensen many once-in-a-lifetime opportunities, in the immediate sense, he has also received direction for his future. "The first year I participated in BEST, I was on the engineering side, and I realized quickly that engineering is not for me, so BEST helped me decide what kind of path I want to follow as a career," says Christensen. "I think I want to double major in computer science and pursue a Ph.D. in high-level computer science research."

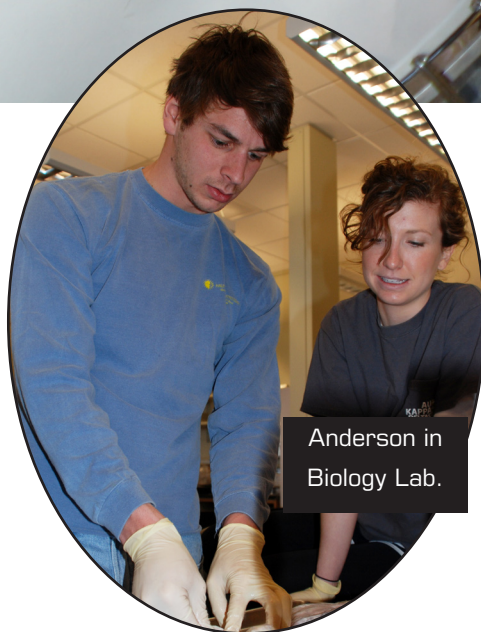
COSAM offers more than 20 outreach programs each year for first-through twelfth-grade students. For complete details, including the COSAM Outreach calendar of events, visit the Website at www.auburn.edu/cosam/outreach. You can also sign up for COSAM's bimonthly Outreach newsletter, *Engaging More Community Connections*, by sending an e-mail request to cosam_outreach@auburn.edu.

A large photograph of Jordan Anderson, a young man with dark hair, wearing a red and blue plaid shirt. He is focused on playing a white banjo. The background is slightly blurred, showing some indoor setting.

JORDAN ANDERSON:

COSAM's RHODES SCHOLAR

BY: CHRISTY KYSER TRUITT



COSAM student-athletes often utilize the contrasting tactics of multi-tasking and focusing on the task at hand. Rhodes Scholar Jordan Anderson is no exception. The Roanoke, Va., native maintains a 3.91 GPA in his senior studies in Biomedical Sciences while leading the University Men's Swim Team as captain in addition to off-campus activities such as leading a Younglife high school group, leading a weekly men's Bible study, etc.

Yet Anderson finds one area of his life difficult to master – the ability to play his banjo while singing.

"Banjo has several things going on at once. I can roll a little bit on the banjo, but I have this need to really concentrate on what I'm doing. I can't seem to reach a point to sing and play at the same time," Anderson laughs.

Perhaps a musical background formulates Anderson's proclivity for the sciences. His father Phil plays mandolin and piano, his mother Beth and older brother Ben play guitar while younger brother Will sings. Holiday jam sessions are common in the Anderson household, allowing the 22-year-old a respite from his recognition as the University's first Rhodes Scholar in 30 years.

COSAM Dean Stewart Schneller speaks to Anderson's range of interests. "I recently had the opportunity to talk to Jordan on my weekly 'Podcasting with the Dean' and had a wonderful experience. The breadth and depth of his

comments on whatever the topic was a testimony to what it means to be a Rhodes Scholar. We talked on everything from science to athletics to literature and to politics. It was truly a meaningful experience for me. He has set an example to be emulated, and the College of Sciences and Mathematics is honored with his achievement as a Rhodes Scholar."

Anderson traveled to Birmingham last November to begin a two-day interview process with 12 other finalists from Tennessee, Alabama and Florida. "There was a dinner the night before the interview. Everyone always said it was almost as important as the interview itself because you were allowed to mingle with the judges," Anderson says. "I was able to meet the other candidates and found them to be way more qualified (than I am). This allowed me to relax and enjoy the process."

Anderson says he felt utter shock when he heard his name. "I still don't know why they picked me or what they saw (in me). My knees buckled."

Dr. Paul Harris, associate director of the Office of National Prestigious Scholarships at Auburn University, knows exactly why Anderson was chosen.

"The best way to illustrate Jordan's impact on others is through the letters of recommendation that are required for the Rhodes application. Four letters are from faculty and four are character references. What makes Jordan special is that within one day of requesting the letters, all eight responded affirmatively regardless of their schedules," says Dr. Harris.

Dr. Harris says that Anderson came to his attention as a potential Rhodes candidate with six weeks left until the application deadline. Typically, students write essays and gather letters of support the spring preceding the October due date. In Anderson's case, Dr. Harris learned of his qualifications at the proverbial eleventh hour.

"Jordan came to my office looking for information on medical school scholarships. That was Friday, Aug. 21, 2009. On Monday, he agreed to apply for the Rhodes scholarship with an Oct. 5th deadline. Jordan spent five daily hours in the pool (as a member of the swim team) in addition to a rigorous full academic and research schedule. In his 'free' time, we worked on his essay, an institutional letter of support and other necessary components of the application," Dr. Harris says. "This recognition is a testament of Jordan's qualifications and determination."

Auburn University Director of Athletics Jay Jacobs concurs, "Jordan epitomizes the very definition of the word student-athlete and embodies Auburn values as well as anyone that I know. He has succeeded at the highest levels in the pool and in the classroom, but he has also evolved to become an outstanding leader both on his team and in the community. We could not be prouder of Jordan and the first-class manner in which he represents Auburn University."

Anderson says the scholarship recognition allows him to re-evaluate his future goals. "I've been in pre-dentistry, but now I want to study medicine," he says, adding that he's applied for the Global Health Science curriculum



"He has set an example to be emulated, and the College of Sciences and Mathematics is honored with his achievement as a Rhodes Scholar."

-Dean Stewart Schneller

at Oxford. The one-year masters program will allow him to focus on underdeveloped countries and relative epidemics.

"I'll look at public health from a global perspective. It is important that I apply for something bigger than myself. This degree brings together people from all over the world who return to their country as ministers of health. I have a real heart for researching global killers as well as public policy related to them," Anderson says.

Having never travelled overseas, Anderson is looking forward to crossing the pond to Oxford in September 2010. His fiancée, Katie Watson, will accompany him following their summer wedding. Among planning a wedding, coordinating his studies as a Rhodes Scholar, completing his college career as captain of the University Men's Swim Team and graduating with honors from COSAM, maybe Anderson will finally master the art of singing while playing the banjo.

"One time, I did sing and play at the same time. Maybe I can do it again," he smiles.



In an address to COSAM's Society for Health Professionals, Jordan Anderson said, "Winning the Rhodes Scholarship has already changed my life."

During my tenure as Dean of COSAM, I used this letter to greet the parents of incoming students. These words seem fitting as I depart...



One of the words that best describes the College of Sciences and Mathematics (COSAM) at Auburn University is enthusiasm. There is student enthusiasm for learning, for growing and for giving back to society. There is faculty enthusiasm for teaching and caring about students as individuals.

There is the very real enthusiasm of the parents of our students. To us, parents are just as much a part of the COSAM family as are the students. This is very gratifying for me.

Let me assure you that your enthusiasm is well placed. As a parent, you are making a great investment in Auburn. First and foremost, you have entrusted us with your most valuable possession, your student. Secondly, you have devoted considerable emotional energy to the well-being of your student to this point in his or her life. Finally, you have unselfishly committed your financial resources to Auburn University to see that your student moves confidently forward. Please know that my colleagues and I in COSAM are dedicated to seeing that all you have done will pay dividends long after your student leaves Auburn.

While with us, your student will be on a journey of learning, reflecting, contemplating and exploring. A great transformation occurs during the university years. Values, beliefs, and preferences are established. As a parent, you certainly will have times when you worry about how your student is being led through these developments that make up the transition from teenager to adult. During this transition, the most important thing you can do is to continue your love, support and understanding.

With best wishes in the Auburn way,

A handwritten signature in cursive script that reads "Stew Schneller".

Stewart W. Schneller
Dean and Professor



COSAM Dean Stewart Schneller's Research Ranks in Auburn University Top 10

1. Center for Microfibrous Materials Manufacturing: High Performance carriers and structures for logistical fuel processing, \$9.9 million.
2. Fisheries and Allied Aquacultures: Center for Aquatic Resources Management, \$8.6 million.
3. Polymer and Fiber Engineering: National textile center grant, \$6.9 million.
4. Human Development and Family Studies: Family Environment Research, \$6.6 million.
5. Airline Cabin Environment Research Center: Air cabin environment research, \$6.4 million.
6. Center for Materials Processing: Commercial Space Center, \$5.4 million.
7. Center of Bioenergy and Bioproducts: High tonnage forest biomass productions systems from Southern Pine Energy Plantations, \$5 million.
8. Chemistry and Biochemistry: Therapeutics for pox, filo and other viral pathogens, \$4.9 million.
9. National Center for Asphalt Technology: Paving of test track, 4.1 million.
10. National Center for Asphalt Technology: Airfield pavement research and technology program, \$3.2 million.

Courtesy Opelika-Auburn News

PROFESSORSHIP HONORS AUBURN MATHEMATICS ICON DR. ROBERT K. BUTZ



"His guidance made a great impact on my professional life."

-Dr. Phillip Bean on Dr. Robert K. Butz



(above) Pictured here are, from left,
Dean Stewart Schneller,
Dr. Robert K. Butz, and
Dr. Phillip Bean.

Dr. Robert K. Butz, a longtime professor of mathematics at Auburn, has been honored by one of his former students with the establishment of an Endowed Professorship in the Department of Mathematics and Statistics. Starting in 1958, Dr. Butz taught a variety of courses in algebra, linear algebra and matrix theory. In these courses he imparted his love and knowledge of mathematics to hundreds of students. Additionally, Dr. Butz directed the Summer Institute in Mathematics, which was designed for secondary school teachers who wanted to refresh their knowledge and obtain certification for teaching secondary mathematics.

Dr. Phillip Bean, a former student who shared Butz's passion for mathematics and education, established the professorship honoring the Auburn mathematics icon. Dr. Bean earned bachelor's, master's and doctorate degrees all from Auburn University, and is Professor Emeritus of Mathematics at Mercer University in Macon, Ga.

"Dr. Butz motivated his students by giving lucid lectures and by showing keen interest in their understanding of mathematics," remembers Dr. Bean. "I feel fortunate to have been a student in several of his classes. Because of special efforts made by Dr. Butz on my behalf, I was accepted into the graduate program in mathematics at Auburn after the deadline for application past. His guidance made a great impact on my professional life."

The professorship endowment is designed to attract superior faculty to the Department of Mathematics and Statistics, and the faculty member with the title "Butz Professor" will carry that prestige in advancing mathematics education.

"We were honored by the gift of a professorship from Dr. Phillip Bean, one of our graduates," says Dr. Michel Smith, department chair of Mathematics and Statistics. "This gift will give us a unique opportunity to recruit excellent teachers who will serve as models of excellence in graduate and undergraduate instruction."



To establish a professorship in memory of or in honor of a favorite professor, contact:

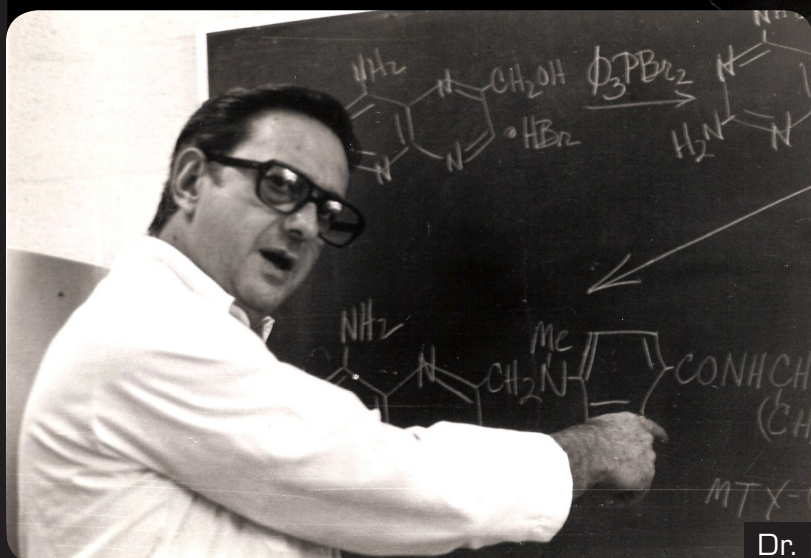
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BATTLING CANCER

AUBURN ALUM RECEIVES FDA APPROVAL

BY: CANDIS HACKER BIRCHFIELD



Dr. Bob Piper, Chemist

After a 40-year career as a chemist, Dr. Robert (Bob) Piper, (Bachelor of Science, Chemistry '55, Ph.D., Chemistry, '60), has some advice for anyone thinking of choosing chemistry as a career. "The lab work is demanding so you have to be prepared to work long hours in the laboratory and enjoy it," says Dr. Piper. "A chemist shouldn't feel like working in a lab is something you are assigned to like a scourge. Don't do it unless you love it, unless you feel it is your calling in life."

Dr. Piper realized he had a passion for chemistry early in his college career.

"My very first chemistry professor at Auburn, Dr. James Land, got me off on the right foot. He was a very knowledgeable, erudite, dignified chemistry professor," says Dr. Piper. "The way he conducted his lectures was well-done, smooth and impressive. His lectures flowed with direction, they were inspiring, and he showed real leadership both inside and outside the lecture hall."

Dr. Piper, who received all of his chemistry education at Auburn University, believes that professors like Dr. Land provided him with a strong educational foundation, upon which he built an exceptionally successful career as a chemist at Southern Research Institute.

When he first arrived at Southern Research, Dr. Piper worked on a project that was financed by Walter Reed Army Institute of Research. Charged with the task of developing a compound that would protect cells from ionizing radiation, Dr. Piper spent many hours in the laboratory. "The compound was supposed to be used to protect the soldiers. We did find something that worked, but it had to be administered intravenously and they wanted something in pill form that could be administered to soldiers in the field," recalls Dr. Piper.

Shortly after his work with Walter Reed in the early 1970s, Dr. Piper began a career-long joint research project between Southern Research Institute, SRI International in Menlo Park, Calif., and Memorial Sloan-Kettering Cancer Center in New York. Methotrexate, a leading compound that was administered to cancer patients, had demonstrated high levels of toxicity. Dr. Piper, along with Drs. Joe DeGraw, Ph.D., and William Colwell, Ph.D., at SRI International, were charged with the task of improving methotrexate by making it less toxic, and at the same time, more effective.

"It was a very slow process," says Dr. Piper. "We spent 10 to 12 years making many, many folic acid anti-metabolite compounds." The most promising compounds were



Dr. Piper, his wife Bobbie, and Aubie smile for the camera at a COSAM football tailgate. "He loved chemistry right from the start," says Mrs. Piper. "He worked in the lab every night when we were first married, so I spent many nights in the lab with him."

packaged and mailed to Dr. Francis Sirotnak, Ph.D., a molecular pharmacologist at Sloan-Kettering, to be tested on rats and mice. "When I retired 12 years ago, all of our most promising compounds were in testing," says Dr. Piper.

After much testing, the compound that proved to be the most successful was developed into a drug called pralatrexate. Then, in the mid-1990s, pralatrexate was licensed to Allos Therapeutics for further development. Ultimately, after more than 30 years of collaborative research and testing, the anti-cancer drug that Dr. Piper and his team worked so tirelessly to develop was approved by the U.S. Food and Drug Administration in September 2009. Allos is producing the drug under the name Folutyn, and it is now available for cancer patients suffering from some forms of peripheral T-cell lymphoma.

"Among our goals, our high-priority goals, is a strong desire to improve human health. If we are able to participate in the development in a new anticancer drug that really will help people, it's a great achievement for this organization," says CEO of Southern Research Institute, Dr. John Secrist, Ph.D. "Anytime we contribute a drug that will help patients, we feel that we are accomplishing our mission."

Thus far, Southern Research Institute has received FDA approval on seven drugs whose research and development originated with the organization. According to Dr. Secrist, it is the work of chemists like Dr. Piper who enable the stringent approval process to go smoothly. "The team that worked on pralatrexate was tremendous. They pushed clinical trials early and their efforts, their focus, allowed the drug to be pushed into the clinic in a relatively efficient manner and that's not easy," says Dr. Secrist. "Bob, in particular, was an excellent collaborator with the other groups involved in the research. Throughout his career he was just an outstanding chemist. He was very, very focused on developing sound methods for making all of the compounds that he and his group created, so you could depend upon being able to reproduce anything they published. I think that view was held by everyone in the scientific community. He was a great asset to this organization over his career, and we have missed him since he retired."

As for Dr. Piper, he says that his focused work ethic and attention to detail was driven by a passion for chemistry. "I enjoyed working on the anti-folates. It was very interesting chemistry," says Dr. Piper as he reflects on the development of pralatrexate. "If I got a chance to do it over, I'd gladly do it all again."

CMB PROGRAM: REACHING STUDENTS OF ALL AGES

BY: CHRISTY KYSER TRUITT

The Cellular and Molecular Biosciences (CMB) program is an interdisciplinary effort that began in 1999 when 75 scientists built upon the research strengths of Auburn University life science faculty. COSAM is the administrative home of the interdisciplinary CMB program which also includes faculty from the College of Agriculture, the Samuel Ginn College of Engineering, the College of Human Sciences, the Harrison School of Pharmacy, and the College of Veterinary Medicine.



Rising juniors and seniors in high school can spend two weeks at Auburn learning laboratory procedures and techniques. Pictured above are the 2009 junior and senior participants with administrators and professors.

The founding faculty recognized that at the core of the program is a commitment to enhancing research opportunities for both undergraduate and graduate students. The CMB program includes 12-month graduate assistantships, summer undergraduate assistantships and summer high school assistantships. In addition, the program has spearheaded the development of the Undergraduate Research Forum that is held annually to showcase the research endeavors of all students conducting undergraduate research on the Auburn University campus.

Since 2003, the Teaching Enhancement Awards (TEA) have been provided from a National

Science Foundation (NSF) grant. In relation to the University's charge of outreach, selected rising juniors and seniors in high school spend two weeks under Auburn faculty mentors learning laboratory procedures and techniques in which they are interested. The high school teachers attend the third week to engage in the hands-on research projects being carried out by the student. The students receive a monetary incentive plus free room and board at the University to work with research scientists from the College of Sciences and Mathematics, the College of Veterinary Medicine and/or the Samuel Ginn College of Engineering, who also receive a stipend for their programs. Subsequently, the high school teachers also receive a stipend. The following school year, the students become classroom mentors as their teachers introduce the research projects to their classes.

Last summer, students like Johnathan Williams of Beatrice, Ala., and Shamori Maxwell of Tuskegee, Ala., worked with Dr. Laura Sil-Suh, Biological Sciences, and Dr. Aaron Rashotte, Biological Sciences, respectively. Williams completed four microbiology modules where he identified the microbes' location in the environment; identified commonly used spics that have antimicrobial activity; learned which household products have the most antimicrobial activity; and finally, learned that purified antibiotics, such as those used in medical care, are very potent antimicrobials.

Dr. Rashotte says he exposed Maxwell to a range of techniques practiced in his lab on a regular basis while she collected the data. Both students prepared a poster on their experience and presented them to other TEA members, teachers and University faculty.



"The TEA program is a really great program that allows high school students to gain real hands-on experience in a college research lab," Dr. Rashotte says. "The idea is not only to give them a true lab experience and expose them to life at a university, but to have them learn some methods or experiments that can be taken back with them for use in their high school."

Also funded by an NSF grant, the summer undergraduate program provides a stipend for each student to work with faculty on selected research, while the participating faculty receives funding for project-related items.

The 12-month graduate assistantship program is actually funded with University dollars. A select group of graduate students perform research under the guidance of University faculty and are awarded an annual assistantship. These fellowships allow the CMB program to compete for high-quality students.

"The CMB program has been an umbrella for the recruitment and training of high school, undergraduate and graduate students, as well as highlighting the importance of research scholarship to our academic mission," says Dr. Marie Wooten, associate dean for research in COSAM.

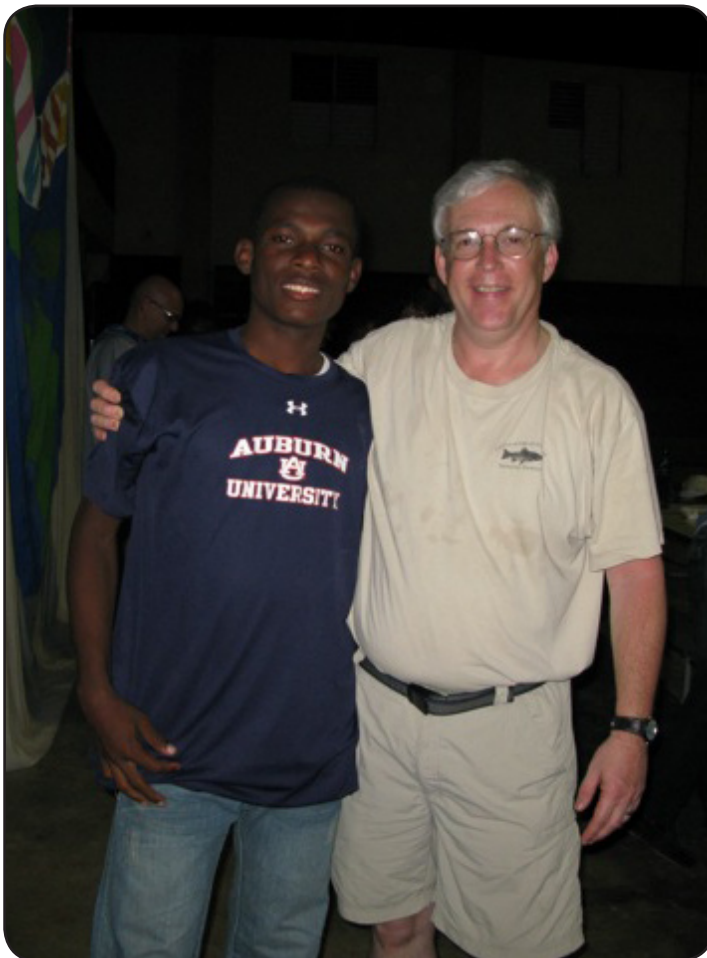
More About CMB (above):

The CMB program at Auburn University offers its graduate students an opportunity to gain experience in grant writing, proposals and oral presentations through weekly seminar evaluations. Directed by Dr. Frank F. Bartol, alumni professor and associate dean for research and graduate studies with the College of Veterinary Medicine, students are critiqued by faculty members and peers as they write abstracts and give PowerPoint presentations on their research. Pictured above is CMB doctoral student Shankar R. Pant, listening to comments and critiques regarding his presentation on his research of an avian flu vaccine. Comments range from critique of content and overall flow of the presentation, to Power Point slide design and professional appearance. The Professors in the room, Dr. Bartol, Dr. Frederik W. van Ginkel, associate professor in the College of Veterinary Medicine, and Dr. Vicky van Santen, associate professor in the College of Veterinary Medicine, also quiz Pant on his scientific knowledge of the subject matter.

"We give the students advice on the scientific questions they should be able to answer, especially if they find themselves trying to get a grant from someone," says Dr. Bartol. "We encourage the students to be willing to offer and accept criticism as it encourages them to be better colleagues in the long run. I feel fairly confident that these students have a leg up, because of this experience and the mentoring they receive."

For more information on the CMB program, please visit the following online:
 CMB <http://www.auburn.edu/cmb/Graduate%20Programs.html> (program)
 USRS <http://www.auburn.edu/cmb/Undergraduate%20Programs.html> (program)
 USRS <http://www.auburn.edu/cmb/auurf/index%202010.htm> (forum)

COSAM ALUMNI OFFER HELP TO THOSE IN NEED IN HAITI



Translator, Maucler Charles (left), with Dr. Tommy Simpson. Charles has aspirations of college and a better life, and Auburn University is at the top of his list.

Dr. Tommy Simpson (Premedical Sciences, Chemistry '80) is a Rome, Ga. oncologist. Dr. Simpson's past commitment to medical mission work provided a wide variety of experiences, but nothing could prepare him for the devastation he and fellow team members faced following the catastrophic earthquake that hit Haiti on Jan. 12, 2010. During his eight-day stay in the impoverished and now devastated country, Dr. Simpson encountered countless cases of broken bodies and broken families. But in the midst of chaos there were glimmers of hope, specifically among the young people he encountered at a private school based in the village where he dispensed care. Dr. Simpson's translator, Maucler Charles, has aspirations of college and a better life, and Auburn University is at the top of his list.

Back in Georgia, Dr. Simpson stays in touch via e-mail, when possible, with many he encountered in the beleaguered island nation. He left with mixed feelings of accomplishment for those he touched, but sadness for the severity of the issues facing Haiti. As he boarded a plane to leave the island for home, he recalled the words uttered at the conclusion of a previous mission trip: "It's back to the real world." "No," a colleague corrected, "This is the real world."



"The children of Haiti are like all children of the world. Give them a little attention and show that you care for them ... and they will do most anything that you ask"
-Dr. Gene Birdsong



Dr. Gene Birdsong, Pre-medical Sciences, '57, is a veteran of disaster care following his work during the tsunami-relief effort in southern Asia. Once again he has volunteered his time, talent and resources to assist those in need, this time following the devastating earthquake that crippled Haiti on Jan. 12, 2010, "We could not cure all of their ills —so much was associated with the post stress of the earthquake or the "event" as these people called it. Never did they say earthquake. Hopefully, we gave them a few days of a better life and showed them that we as Americans loved and cared for them," says Dr. Birdsong.



"The parents all seem to be very appreciative of any time we can give the children. I was probably the first physician some of them had ever seen."
-Dr. Gene Birdsong





2009-2010 COSAM LEADERSHIP COUNCIL

For more information on the
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involved contact:

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WHAT IS THE COSAM LEADERSHIP COUNCIL?

The COSAM Leadership Council was established to provide advice and guidance to COSAM administration, assist in efforts to acquire necessary resources for the College, serve as mentors to the College's undergraduate and graduate majors, provide lectures to student groups, and assist in faculty recruitment. This elite group of approximately 55 members is comprised of alumni and friends of the College who seek to enable COSAM to achieve excellence in teaching, research, and outreach in the sciences and mathematics.

Please look for profiles of Leadership Council members in upcoming COSAM publications.



LEADERSHIP

