



MTSU
College of Basic and Applied Sciences



The Basic Facts

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The Science of Success

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AERO Signs MOU with Safe Skies Alliance

Encouraged by Danni Varlan of the Tennessee Board of Regents and President Sidney McPhee, Aerospace has developed a partnership with Aleoa, Tennessee, based Safe Skies Alliance. President and CEO of SSA, Scott Broyles described the national role that SSA plays in certifying



airline/airport security systems. President McPhee spoke about the natural partnership between SSA and our new Masters program in Aviation Safety and Security. We look for a great partnership to evolve and are certain SSA will be great advisors and partners in the new program.

MTSU Acquires New Electron Microscope

MTSU's Interdisciplinary Microanalysis and Imaging Center is proud to announce the acquisition of the TESCAN LYRA 3 focused-ion beam-scanning electron microscope workstation. This state-of-the-art device will greatly enhance research across the disciplines. MTSU chemistry professor and MIMIC director, Ngee-Sing Chong says, "The reason both TESACN and MTSU are so excited about this is because MTSU is the first U.S. customer for the FIB-SEM

system." The workstation can be used to develop nanomaterials for chemical analysis and catalytic acceleration of chemical reactions. The instrument will have 3-D imaging capabilities to see samples in newer, more powerful ways. Physics applications include observing the characterization of solar cells and fabricating "photonic circuits," where light is used in place of electricity. The equipment will be installed this fall and will enrich MIMIC as a training and research facility.

New MSE Ph.D. Director

Angela Barlow took over on August 1, as the new Mathematics and Science Education PhD Director, after a national search.



Dr. Barlow has all of her degrees in Mathematics Education from Auburn University and has taught at the University of West Georgia, and most recently, at the University of Mississippi. She is a passionate teacher, consistent researcher, and has mentored eight Ph.D. student in math education over the last two years. We are delighted to have Dr. Barlow as a new faculty member in the Mathematical Sciences Department and as the new leader of our MSE Ph.D. program. We are grateful for the wonderful work of Dr. Ginger Rowell over the last two years as our interim director.

MS-PS Presentations

On August 4, the Master of Science in Professional Sciences (MS-PS) program featured eleven impressive student capstone presentations. Each semester, MSPS students acquire workplace experience, complete detailed portfolios on professional projects, and present an overview of the internship experience before peers, faculty and industry partners.

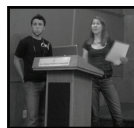


Companies supporting interns include: Sarah Cannon Research Institute, Vanderbilt University, Med Solutions, Test America, Tennessee Department of Health, Advanced Bio Healing, Vi-Jon, and Industrial Microbiological Labs.

Pictured front row left to right: Shirsha Advalli, Janet Kelly, Rebecca Seipelt, Saeed Foroudastan, Ginger Rowell, Maxim Terekhov. Back row left to right: Suzet Galindo-Martinez, Dana Perry, Shane Newman, John Ihrle, Hisham Abu-Taleb, Kristen Panter, and Amir Kashef Mobarekeh.

COMS Ph.D. Students

Zach Jones, PhD student in Computational Science, spent three weeks at Cold Spring Harbor Laboratory which was a very enriching experience. Computational cell biology is a field of study that has gained a lot of interest in the past decade. "Since I



have a background in both mathematics and biology and my research interests lie at the interface of these two, this unique opportunity to study the latest areas of research in this field at one of the most famous molecular biology and genetics research laboratories in the world was something I could not pass up," he said.

The course he participated in was organized in such a way that practicing experimentalists and theoreticians in the field would come for a one to three day visit to lecture and interact with the students. He had the opportunity to meet and talk with some of the biggest names in the field.

Cori Hendon, PhD student in Computational Science, was privileged to spend time this summer at Los Alamos National Lab (LANL) in New Mexico participating in the Computational Physics Student Summer Workshop. The purpose of the workshop was to educate students in the challenges and applications of computational physics of interest to LANL and to create interest in these challenges. This was done by providing lectures for an overview of computational physics topics at LANL ranging from Electro-Magnetic Pulse simulation to the verification of scientific codes and by having the participants projects involved two very different verification procedures for the production software xRAGE involving adaptive mesh refinement error quantification and analysis and spatial convergence rate investigation using the method of manufactured solutions. The work Cori did on quantitative code verification will be useful in his PhD program at MTSU.



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The Basic B.E.S.T. (Boastful Educators Sharing Talents)

All departments are invited to submit items for this column

Agribusiness/ Agriscience

Nate Phillips conducted a month long experiment to try to subsist solely on food produced on our MTSU farms. His diet consisted of various vegetables and fruits, pork, corn meal, milk, and honey. By the end of July, he had dropped some weight and noticed that he is more sensitive to taste now that he hasn't been bombarding his tongue with all the artificial flavors, high fructose corn syrup, and salty snacks. He has also come to appreciate all the hard work of students, staff, and faculty that are involved in the MTSU farm labs. In his opinion, the MTSU dairy and milk processing unit is the superstar of the farm labs.

Biology

Andy Brower went to São José do Rio Preto, Brazil, to give an invited symposium presentation at the 30th annual meeting of the Willi Hennig Society, on August 2. The symposium was titled "History and Philosophy of Cladistics," and Dr. Brower's talk was "Parsimony and Justification."

Wayne Rosing published a paper in *PACIFIC SCIENCE*, a publication of the University of Hawaii Press titled "Additions to the Myxomycetes of Singapore."

The NSF TRIAD GK12 graduate student training program had a great year! Our team (Anthony Farone, Mary Farone, Kim Sadler, Ginger Rowell, and especially our coordinator, Karen Case) supported eight STEM Graduate Fellows (four MTSU graduate students and four graduate students from TSU). The Fellows in the TRIAD program receive three-fold training: from their research mentor, their high school partner teacher, and their biotech industry partners. The GK12 program's goal is to broadly prepare STEM graduate fellows for professional and scientific careers in the 21st century. This year's team of Fellows was very productive. The four MTSU Fellows gave eight research presentations at local, regional, and national meetings. They also traveled to the American Academy for the Advancement of Science meeting in San Diego, CA, where they

gave two presentations and the national GK12 meeting at NSF in Washington, DC, where they presented four posters. In the classroom, Fellows mentored more than 50 high school biology research projects at Blackman, Siegel, and Oakland high schools. Fellows also visited local biotech companies, and received professional development training through our not-for-profit partner, BioTN. We have recently selected our Fellows for the 2011-12 year and will be supporting eight graduate students from CBAS (Chasity Suttle, Emily Mattison, Jess Matz, Patrick Cusaac, Eric Salmon, Tiffany Saul, Alison Carey, and Julie Folks).

Mary and Anthony Farone had a paper accepted for publication in the *Journal of Research and Reports in Tropical Medicine* titled "Bacterial Enteropathogens Associated with Diarrhea in a Rural Population of Haiti."

Chemistry

Preston MacDougall was invited to give a talk at the 9th Congress of the World Association of Theoretical and Computational Chemists in Santiago de Compostela, Spain. He lectured on "Volume-rendering in Tandem with Hyperwall Technology for a New Molecular Visualization-based Platform for Drug Design."

Sharon Smith (ORS), Joan Obot and Judith Iriarte-Gross (CHEM) organized and hosted a Soccer Girls Science Saturday on July 30. Eleven girls and their parents from Stones River Futbol Club-02 Lady Rapids Soccer Team learned about careers in science and were invited to attend the MTSU EYH on October 22. The girls participated in hands-on activities such as "Balloon Kabobs," "Diaper Polymer," "Egg in the Bottle," and they made slime. They also made UV bead bracelets and painted their nails with UV sensitive nail polish.

Computer Science

Cen Li presented the paper titled "PeerSpace--An Online Collaborative

Learning Environment for Computer Science Students" at the 11th IEEE International Conference on Advanced Learning Technologies, on July 6-8, in Athens, GA. The paper is co-authored by Cen Li, Zhijiang Dong, Roland Untch, Michael Chasteen (MS student), and Nathan Reale (BS student). The paper was chosen for the Best Paper Award at the conference.

Cen Li, Zhijiang Dong, Roland Untch, Nathan Reale, and Michael Chasteen published a paper titled "Developing An Online Peer Learning Environment for Computer Science Students" in the proceedings of the 9th International Conference on Computer Supported Collaborative Learning, in Hong Kong, China, from July 6-8.

Cen Li, Zhijiang Dong, and Brenda Parker co-organized three Computer Science week-long summer camps for local high school students from July 11-15. A total of 60 high school students attended the three camps: the Alice Animation Camp, the Robotics Camp, and the Multimedia Camp. CSCI graduate and undergraduate students: Sarah Bell, Michael Chasteen, Jesse Keogh, Peng Pan, Chelsea Rath, and Ryan Wilson, have served as student helpers for the camps.

Three teams of Computer Science students worked on real world projects for local companies and organizations this summer. The team led by Cen Li worked on designing and creating an online survey Web site for Thompson Machinery in LaVergne, TN. The Web site facilitates user management, survey presentation/delivery, date collection and analysis for the annual safety survey conducted by the Caterpillar dealerships across North America and Canada. Students on this team are: Audrey Bolton, Jessica Rogers, Matt Houghlum, Christopher Vogel, and Aron Hauth. The team led by Chrisila Pettey worked on developing Second Life virtual worlds for children suffering from Autism. The project is in collaboration with the Vanderbilt Kennedy Center and the Vanderbilt School of Engineering. Team members: Jeffery McRiffey, Zach Moore, David Pettey, and Sean Layne. The team led by Jungsoon Yoo developed new Web site features for the local music company, FanBank Music. Students on this team are: Brittany Motsinger, Peng Pan, Noah Snell, and Joshua Wade. The

teams are funded by the NSF PFI grant (PI: Tom Cheatham) aimed to recruit and retain students in the IT/ Computing Fields.

Engineering Technology

Saeed Foroudastan presented a paper titled "Intercollegiate Design Competitions and MTSU's Machine Shop: Kindling Engineering Technology-Student Creativity & Confidence," at the 2011 Annual American Society of Engineering Education (ASEE) Conference, in Vancouver, British Columbia Canada, in June. The paper was accepted for presentation and publication through a peer-review process for the ASEE Conference Proceeding. He also was moderator for a session titled "Interdisciplinary Education in Engineering Technology." Dr. Foroudastan reviewed eight papers for this conference.

On July 15, the ET student team consisting of graduate student, Marquis Wilkins, and undergraduates, John Morgan and Robert Saye, gave their SIX SIGMA project presentation on "Supplier Capability Analysis" to management at Parthenon Metals, Inc., in LaVergne, TN. The company benefitted as well as our students who received their certifications as SIX SIGMA Greenbelts as a result of their successful project.

Mathematical Sciences

Yuri Melnikov published a paper titled "Construction of Green's Functions for the Two-dimensional Static Klein-Gordon Equation" in the *Journal of Partial Differential Equations (Vol.24, No. 2, pp. 114-139)*.

Yuri Melnikov made the keynote presentation titled "Alternative Forms of Green's Functions and Infinite Product Representation of Elementary Functions" at the International Conference on Computational & Experimental Engineering and Sciences held in Nanjing, China, from April 18-21. Joey Allman passed exam p on July 20.

To date, there are three students from China that have visas and will join the MTSU ACSI program for their undergraduate study. One will arrive on August 4, and the other two will arrive on August 19.