



The Basic Facts

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The Basic Facts, College of Basic and Applied Sciences, Middle Tennessee State University, Murfreesboro, TN

The Science of Success

MTSU and UTISI Partnership Begins

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The following article by Laren Anderson, Staff Reporter, appeared in the *Daily News Journal* on July 2, 2002.



Officials from MTSU and the University of Tennessee Space Institute signed an agreement Monday, July 2, 2002, allowing the two schools to begin sharing facilities.

Signing the agreement on the campus of MTSU were the University's President Sidney McPhee and Dr. John Caruthers, chief operating officer, of UTISI in Tullahoma. Professors and officials from MTSU and UTISI attended the event in

addition to U.S. Representative Bart Gordon.

"This is one more step to creating a high-tech corridor between NASA's Marshall Space Flight Center in Huntsville, the Oak Ridge National Laboratory, Tennessee Tech, UTISI and MTSU," Gordon said.

Gordon is the ranking member of the science committee overseeing NASA. He also worked with projects at the Oak Ridge nuclear laboratory.

Sharing the facilities may not succeed, Gordon said. But the schools should at least "stir the pot," the congressman added.

"The reasons we started this conversation is that we have a master's (program) in aviation system at UTISI and MTSU has a similar master's program," said George W. Garrison, professor of mechanical and

industrial engineering at UTISI.

Neither school will have additional costs due to the agreement, McPhee said.

"All faculty are in place and support systems are in place," the university president said. "We're just leveraging these resources."

The project is a "living breathing initiative," McPhee said, adding the collaboration should grow in the future with the addition of research interests.

The first class begins this fall, the president noted.

Offered by the computer science department at MTSU, the class will be open to graduate students at the two locations, said Don Curry, Vice Provost for Research and Dean of Graduate Studies at MTSU.

UTISI was established in 1964 as part of the University of Tennessee. The school enrolls about 220 graduate students and has 35 faculty members.

Accolades for the Center for Environmental Education



Hard work by the MTSU Center for Environmental Education was recognized during a special presentation May 30 at MTSU.

The center staff earned one of the 2002 Environmental and Conservation Stewardship Awards presented by the Tennessee Department of Environment and Conservation.

Center co-directors Dr. Padgett Kelly and Dr. Cindi Smith-Walters, Dr. Kim Cleary Sadler and Karen Hargrove, all from biology, were presented the Higher Education Stewardship Award.

"It's certainly a great honor for the center and the university to be acknowledged by the Department of Environment and Conser-

vation," Kelly said. "It's nice to be recognized by your peers - other professionals in the environmental field. A lot of people have worked very hard over several years."

Kelly and Smith-Walters said the award is even more valuable because virtually all of the center's funding is not from the state or university budget.

"The center is a classic example of doing a lot with very little," Kelly said. "We operate almost totally on grant money."

"It is interesting to know that we have garnered more than \$1 million in grants and contracts in the past nine years and have run the center without any university money," Smith-Walters said.

Hargrove nominated the center for the award.

"The center has a 20-plus year history of providing quality environmental education and consultation to a wide audience that

includes teachers, students, youth leaders and the general public."

Hargrove wrote in the nomination. "Since its beginning in 1979 with a grant from TVA, the center has steadily 'grown itself' by adding programs and services while moving from a professor's closet to its current site on the MTSU campus."

The center has a lending library of materials available in the Department of Biology and a full-fledged outreach program that not only makes microscopes and other science tools available to teachers and their classrooms, but serves the community through education programs in green shopping and recycling, field trips and tours, class and school programs, and more.

The above article by Randy Weiler appeared in the June 24, 2002 issue of *The Record*.

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PRISM Learning

A camp that encourages students to focus on math, science, and technology. A camp new to Murfreesboro and created by MTSU and Murfreesboro City Schools. Camp PRISM (PRactice In Math and Science).

The camp offered 23 fifth-graders from various schools an opportunity to learn more about math, science and technology.

"It is really an introduction to the different fields of math and science to help them maintain interest in those subjects," said Rebecca Zijlstra (MATH), co-

ordinator of the camp.

The students were selected by city teachers to attend the camp free of charge. The camp, which was anchored primarily at Hobgood Elementary School, was funded by the Jennings and Rebecca Jones foundation and a grant from the MTSU Division of Continuing Studies and Public Service.

Some of the activities students were involved in included building a robot, investigating time and distance concepts using a stopwatch and ramps, experiments in materials science and locating the epicenter of an earthquake. Many of the students said their favorite

activity was building robots from parts kits.

The camp involved faculty members from nine departments at MTSU, including aerospace, biology, chemistry, engineering technology and industrial studies, mathematics, physics and astronomy, geology, agriculture and elementary education.

The camp was intended to expose students to various fields of math and science using hands-on activities and independent projects and to allow students the opportunity to see the application of mathematics and sciences through field trips to local industry, government and learning facilities.





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

All departments are invited to submit items for this column

Agribusiness/Agriscience

Kevin Downs and Joey Mehlhorn presented "The Influence of Cross-Disciplinary Learning on Development of Critical Thinking and Team Building Skills in Undergraduate Students" at the NACTA Conference in Lincoln, NE in June.

Liz Troup and student manager **Katie Jones** attended the annual meeting of the Tennessee Association for Milk, Food and Water Safety. **Troup** also provided a program for National Dairy Month at the Homer Pittard Campus School Summer Program in June

Warren Anderson has involved students in the ABAS 4350 Soil Survey and Land Use class in a project relating to soil mapping at the MTSU Dairy Farm. He has thirteen students in the class and the results of their work will be presented at the 2003 Undergraduate Research Symposium.

Biology

Jeffrey Walck recently published a paper in the *American Journal of Botany* entitled "Seed Germination Ecophysiology of the Asian Species *Osmorhiza Aristata* (Apiaceae): Comparison with its North American Congeners and Implications for Evolution of Types of Dormancy." He co-authored the paper with his wife, Dr. Siti Hidayati and Dr. Nobuo Okagami (Chiba University, Japan).

Jeffrey Walck, Thomas Hemmerly and Siti Hidayati published a paper entitled "The Endangered Tennessee Purple Coneflower, *Echinacea Tennesseeensis* (Asteraceae): Its Ecology and Conservation" in the spring issue of *Native Plants Journal*.

Chemistry

John DiVincenzo was awarded a grant from International Paper for jump starting a water quality monitoring program jointly with the new Discovery Center at Murfree Spring in Murfreesboro. The proposal was recognized as the outstanding grant for the month of May and was awarded additional monies.

Engineering Technology/ Industrial Studies

David Gore attended the Society of Manufacturing Engineering's (SME) annual meeting in Dallas in May. Two major conferences included "The Collaborative Manufacturing Summit," "The Lean Manufacturing Management Overview,"

and "Value Stream Mapping for Collaborative Manufacturing." Contacts were made with the authors of the textbooks used in his teaching ET 4900/5900, "Productivity Strategies," which includes lean manufacturing and value stream mapping. Groundwork has been started on a possible workshop or conference on this topic at MTSU next spring.

Heather Brown and Dwight Patterson (CHEM) were awarded a grant from a private company for fiber reinforced concrete research. The grant will run from July to October.

Mathematical Sciences

Rajesh Barnwal (co-author) recently published "Testing for Departure from Exponentially Among Distributions Possessing Increasing Hazard Rates" in the *Pakistan Journal of Statistics*.

Curtis Church (co-author) recently published "Phase II Trial of Subcutaneous Interleukin-2, Subcutaneous Interferon- α , 5-Fluorouracil and Cis-Retinoic Acid in the Treatment of Renal Cell Carcinoma: Final Results of Cancer Biotherapy Research Group 94-10" in *Cancer Biotherapy and Radiopharmaceuticals*.

Mary Anderson reports that former student **Lauren Wright** (Math major and McNair Scholar) has been accepted into the graduate program at the University of Georgia where she will study Mathematics Education this fall. She was one of a handful of students to receive a university-wide graduate recruitment opportunity assistantship to help support her while studying there.

Yuri Melnikov had a paper accepted for publication by the *Mathematics and Mechanics of Solids* journal entitled "Influence Functions of a Point Force for Multiply Connected Kirchhoff Plates." The paper will be in the November issue. He will also present a lecture on "Potential Fields Generated by a Point Source in Piecewise Homogeneous Regions of Complex Shape." The lecture will be presented at the 39th Annual Meeting of the Society of Engineering Science which will be held in October at Pennsylvania State University.

CBAS

Fourteen faculty completed this summer's weeklong Instructional Technology Camp which was sponsored by ITD's Faculty Instructional Technology Center. Those participating from CBAS were **Ngee Chong** (CHEM), **Judith Iriarte-Gross** (CHEM), **Pat Patterson** (CHEM), **Dwight Patterson** (CHEM), **David Gore**,

(ETIS) and **Gerald Hill** (AERO).

Summer Research

Bill Allen (AERO) is working with Arnold Engineering Development Center and Sverdrup continuing jet engine emissions research. They have two testing sessions scheduled for this summer at the end of July and the first of August. The engine being used is manufactured by Pratt and Whitney who also makes engines for business and commercial aircraft. The company is interested in MTSU/Arnold Engineering Development Center helping them conduct some testing of some improved internal engine parts and **Allen** will be meeting with a company representative to discuss plans. Pratt and Whitney also are interested in testing turbine blades that are coated with a protective material to determine how they stand up to the abuses of high velocity, superheated airflow.

Amy Jetton (BIOL) is working on a summer project of making quizzes for the anatomy and physiology web site (<http://www.mtsu.edu/%7EBiolap/>). Her graduate student, **Jared LeBouef**, is working on a project exploring relationship between an inflammatory cytokine, TNF-alpha, and glucose in affecting pancreatic beta cell insulin secretion or beta cell apoptosis rates. He is utilizing a radiation-induced pancreatic tumor cell line, INS-1, for these studies. This cell line responds to glucose levels with dose-dependent increases in insulin secretion.

Steve Wright (BIOL) is continuing work on evaluating ticks for genetic sequences characteristic of *Borrelia*. The question for this research is whether true Lyme Disease (*B. burgdorferi*) or Lyme-like Disease (*B. lonestari*) is present in TN. New differentiation probes have been developed and are currently being tested. In addition, he is working with collaborator Melissa Miller (Ft. Mead, MD) to examine if *B. lonestari* is present in the Northeastern U.S. (Melissa has provided hundreds of samples). Graduate student **Sarah Collins** is working with him on the project. 2) He has completed genetic analysis of tick (*Amblyomma americanum*) samples that contained viral sequences that represent a new human enterovirus. This enterovirus has been implicated in cases of aseptic meningitis. Natural transmission of any enterovirus by blood-feeding arthropods has never been reported. Currently he is completing phylogenetic analysis of the sequences and he will then submit for publication. The sequences have been deposited in GenBank. 3) He has nearly completed genetic analysis of patient CSF samples for evidence of infection by the new human enterovirus. Sequence data is

in complete homology with sequences present in tick samples. Patient samples were obtained from collaborator Douglas Beatty, a physician from Smyrna. Undergraduate **Eric Freundt** is working on this for his Honors Thesis. Submission to GenBank and a publication will be forthcoming.

John Zamora (BIOL) is working with several of his students to get ahead on their research. Also, he presented the work of **Samira Rafiq** at the National Meeting of the American Society for Microbiology entitled "The Isolation and Identification of Protease-Producing Bacteria." **Kimber Dunn** is collecting data on lipase producing bacteria, which she has isolated and identified. They are waiting on a kit to see how much lipase each bacteria is producing. **Jesse Carter** is testing antibacterial anti viral and allelopathic properties of the medicinal herb "Osha." **Rebecca McWhirter** is starting her research on another medicinal herb "Ludwigia." This herb is known to have some anti viral and antibacterial properties. **Jamie Rogers** has been taking various water samples from the Stones River and Percy Priest Lake every week since the beginning of April. She is monitoring the number of total bacteria in the water as well as the number of fecal bacteria in the water. **Jerry Trageser** is working on isolating and identifying pesticide degrading bacteria. The name of the pesticide is "diazanon." This pesticide is on the EPA list as one of the dangerous ones.

Matt Elrod-Erickson (BIOL) has four people doing research this summer. **Andy Welch, Jill Danford, and Sirvi Vichidvongsa** are graduate students and **Kristal Taylor** is an undergraduate doing her Honors Thesis. Their projects are as follows: Andy is investigating the role of the BST1 gene in protein sorting at the endoplasmic reticulum. He is making point mutations and a series of deletions and will characterize the effect of these mutations on the function of the BST1 protein. Jill is conducting a genetic screen for genes that when overexpressed cause defects in bud morphology and cytokinesis in yeast. Sirvi is just beginning to do a genetic screen for additional mutations that secrete resident ER proteins to the cell surface instead of retaining them in the endoplasmic reticulum. This phenotype is seen in BST mutants, but they want to know how many other genes give this phenotype when mutated. Kristal is making a protein fusion between the resident ER protein Kar2p and the Green Fluorescent Protein (GFP). This fusion protein will be useful for determining whether resident proteins are being properly retained in the ER.

Summer Research Information to be continued in August.