

# GRANT OPPORTUNITIES

## Newsletter of the Office of Grants and Program Review

October 2003

### NSF Selects UTC to Plan K-12 Engineering Science Curriculum

Staff Writer: Lindsey N. Gosma, Writing Assistant

The Colleges of Engineering and Computer Science and Education and Applied Professional Studies have partnered to improve local engineering science education. Mr. Tom Patty, Director of the Challenger Learning Center, and Dr. Claire McCullough, Associate Professor in the College of Engineering and Computer Science, are Co-Principal Investigators (Co-PIs) for a \$99,806 planning grant to support the development of a comprehensive program to enhance K-12 engineering science education. This project, Bridges to Engineering Science: Teaching Teachers (BESTT), was funded in 2002 by the National Science Foundation's (NSF) Bridges for Engineering Education program.

Dr. McCullough and Mr. Patty embarked on this project after realizing that many K-12 students do not understand engineering or how math and science concepts are applied in engineering fields. They also understand that this problem is not easily resolved. Mr. Patty and Dr. McCullough embarked on this planning project to support their long-term goal of securing grant funds to implement a comprehensive program to enhance math, science and engi-

neering skills among K-12 students and encourage students to pursue careers in these disciplines.

Through their planning-grant activities, Mr. Patty and Dr. McCullough have collaborated with UTC science, engineering, and mathematics faculty, regional K-12 school systems representing over 115,000 students, and a national scholastic publishing company, Charlesbridge Publishing. Planning activities commenced with a meeting among collaborators to (1) discuss K-12 science and mathematics curricular needs, (2) plan a thorough needs assessment of participating school systems, and (3) develop strategies to integrate engineering curriculum into K-12 science education to improve student comprehension of crucial mathematics and scientific concepts. Collaborators have met regularly during the planning process to discuss engineering curriculum, all expressing support for the development of apparatus-based engineering science experiments and curriculums.

Dr. McCullough and Mr. Patty have also designed an innovative strategy for developing the proposed curricular materials in a full-scale project, one engaging UTC engineering and education students in developing and testing the curriculum units and "apparatus bins." Engineering students will design

experiments and the hands-on materials that will constitute the "apparatus bins," and education students will evaluate the effectiveness of the "apparatus bins" against state standards, making suggestions if necessary. In-service teachers at the Challenger Center will evaluate the proposed curriculum and make recommendations, and the Co-PIs will evaluate Challenger Center students' trial usage of the "apparatus bins." Ultimately, Mr. Patty and Dr. McCullough plan to develop teacher manuals and student journals to support "apparatus bin" activities.

This grant demonstrates that NSF has recognized UTC's Colleges of Engineering and Computer Science and Education and Applied Professional Studies as leaders in curriculum reform initiatives. Programs of this type significantly influence the quality of science and mathematics education locally and support UTC's metropolitan mission. The BESTT program, when fully implemented, will expose K-12 students to the engineering sciences, improve their mathematics and science comprehension and help many students see the possibilities of engineering careers.

# GRANTS AND RESEARCH

April 1, 2003 — April 30, 2003

## FUNDED GRANTS

### COLLEGE OF ARTS & SCIENCES

**DR. MIKE BIDERMAN**

ConAgra Foods Inc.

Investigation of Employee Turnover at ConAgra Cook Plant

\$1,740.

**DR. ROBERT KELLER**

National Park Service

Mammal Inventory for Chickamauga and Chattanooga National Military Park

\$3,870.

**DR. ROBERT KELLER**

National Park Service

GIS Basemap Maintenance and Development at Horseshoe Bend National Military Park

\$10,000.

**DR. ROBERT KELLER**

National Park Service

Inventory and Conversion of Surface-Water Impoundments of Obed River

\$10,000.

**DR. ROBERT KELLER**

WildCare

Support of UTC Institute of Wildlife Rehabilitation

\$5,250.

**DR. BARBARA MEDLEY**

Community Foundation

Data Input and Analysis of Public Education Opinion Survey

\$13,782.

### COLLEGE OF EDUCATION & APPLIED PROFESSIONAL STUDIES

**MS. CYNTHIA WOOD**

U.S. Department of Education

South Chattanooga (SoTech) and Westside (WesTech) Community Technology Centers

\$296,679.

### COLLEGE OF ENGINEERING & COMPUTER SCIENCE

**DR. PHIL KAZEMERSKY**

Tennessee Valley Authority

Student Research — Mubuarak Eltom

\$15,000.

## SUBMITTED GRANTS

### COLLEGE OF ARTS & SCIENCES

**DR. TATIANA ALLEN**

National Research Council	Collaborative Research in St. Petersburg, Russia on Amorphous & Microcrystalline Silicon Films for Photovoltaics Applications	\$9,050.
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**DR. HABTE CHURNET, DR. BOB MARLOWE, DR. JERALD DAUER**

THEC	It's About Time: Science for a Sense of Scale	\$39,311.
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**PROF. DAWN FORD, DR. HENRY SPRATT**

THEC	Scientific Investigation With the GLOBE Program: Year Three	\$30,646.
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**DR. JOHN GRAEF**

Civilian Research and Development Foundation	Oscillatory & Nonoscillatory Properties of Solutions of Functional Differential & Difference Equations with Applications to an Automatic Control Problem	\$3,150.
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**DR. ANN HOLMES, DR. JONATHAN MIES**

THEC	Curriculum Development & Content-Area Workshop for Middle School Teachers of Earth Science in Southeastern Tennessee	\$45,898.
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**DR. RALPH HOOD**

National Endowment for the Humanities	Creation of DVD Archive for Serpent Handling Sects	\$75,654.
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**DR. LAUREN INGRAHAM, DR. JENNIFER BEECH**

THEC	Using Nonfiction to Build Critical Literacy	\$64,597.
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**DR. ROBERT KELLER**

Tennessee Department of Environment & Conservation	Walden Ridge Land Use Assessment	\$52,199.
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**DR. ROBERT KELLER**

Caldwell Foundation	Operational Funds for UTC Environmental Sciences Graduate Students Program	\$50,000.
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**DR. PEGGY KOVACH**

National Institutes of Health	Molecular Pathology of Deafness Due to Mutation in PMP22	\$189,609.
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**DR. SEAN RICHARDS, DR. PEGGY KOVACH**

National Institutes of Health	PAH/Metal Exposure and Effects Assessment in Chattanooga	\$178,953.
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**DR. RON SMITH, DR. OSSAMA SALEH**

THEC	Applications of Algebra, II	\$72,831.
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## COLLEGE OF ARTS & SCIENCES

### DR. JOHN TUCKER

Tennessee Tech. Univ. Environmental Justice Planning Tool \$19,432.

### MR. KIM WHEETLEY

THEC Arts Integration & Arts Exploration \$65,890.

## COLLEGE OF BUSINESS ADMINISTRATION

### DR. BENI ASLLANI

IBM Improving Online Immigration Services and Reducing Applications Processing Time \$15,000.

## COLLEGE OF EDUCATION & APPLIED PROFESSIONAL STUDIES

### DR. DEBORAH MCALLISTER

Sun Microsystems Sun Web-Hosting of the Chattanooga Math Trail \$15,985.

### DR. DEBORAH MCALLISTER

THEC Mathematics Navigations and Number \$75,000.

### DR. VALERIE RUTLEDGE

THEC English as a Second Language Professional Development \$52,860.

### DR. MARY TANNER

Holmes Partnership Kenneth Howey Award for Contribution to Urban Education \$1,500.

## COLLEGE OF ENGINEERING & COMPUTER SCIENCE

### DR. NESLI ALP

Sun Microsystems Advanced Online Masters of Engineering Management Degree \$20,000.

### DR. NESLI ALP, DR. JOSEPH OWINO

THEC Hands-on Engineering to Enhance Learning in Science \$50,700.

### SIMCENTER

University of Michigan Automotive Research Center Computational Analysis and Design of Automotive Torque Converters \$125,000.

## OTHER

### DR. JOHN MCCORMACK

Corp. for Public Broadcasting Digital Transmitting Equipment for WUTC \$57,284.

### DR. JOHN MCCORMACK

Allied Arts of Greater Chattanooga Voices from Home \$2,520.