

**COLLEGE OF SCIENCE, ENGINEERING AND TECHNOLOGY**  
May 2007

**GOOD NEWS**

**AUTOMOTIVE AND MANUFACTURING ENGINEERING TECHNOLOGY**

Prof. Ann Goebel is the recipient of the Excellence in Curriculum Programming Award, for her "Online Asynchronous Manufacturing Engineering Technology" program here at MSU. This honor was conferred by the Academic and Student Affairs Division of the Office of the Chancellor of MnSCU (Minnesota State Colleges & Universities) at an awards ceremony on April 17 at the Minneapolis Community and Technical College.

**BIOLOGICAL SCIENCES**

An article entitled "Tamoxifen Protects against 17 $\alpha$ -ethynylestradiol-induced Liver Damage and the Development of Urogenital Papillae in the Rainbow Darter (*Etheostoma caeruleum*)" by Eric Elias and Eddie Kalombo, students, and Dr. Steven Mercurio, Professor, will be published in the journal *Environmental Toxicology and Chemistry* of the Society of Environmental Toxicology and Chemistry in the September 7, 2007 issue. It features the Masters Thesis work of Eric Elias and the Undergraduate Research Conference research of Eddie Kalombo. They discovered that the rainbow darter, a fish of southern Minnesota, was sensitive to the endocrine disrupting effects of synthetic estrogen used in birth control pills. It was also influenced by exposure to tamoxifen, an antiestrogen medication used in the treatment of breast cancer. The research indicates that the presence of tamoxifen in the environment may mask many of the endocrine disrupting actions of environmental estrogens, such as development of female secondary sex characteristics in male fish, hypertrophy of ovaries and pathological deposits of fat in the reproductive organs, liver and kidney.

Invited Seminar given by John D. Krenz, Professor, at St. Cloud State University's Biology Department: Conservation Genetics of River Otters in Minnesota (April 9).

Emily Hutchins (Graduate Student) and Brock McMillan, Professor, received the following grant: Hutchins, E.J. and B.R. McMillan. 2007. Effects of reed canarygrass on avian diversity and reproduction. Minnesota Ornithologists' Union. \$2,200.

The students listed below presented their research at the Minnesota Academy of Science Annual Meeting and Winchell Undergraduate Symposium, Hamline University, April 20-21, 2007

IMMUNOLOCALIZATION OF ACTIN IN TRANSGENIC AND WILDTYPE MURINE MYOCARDIUM. Meghan Bohland, Gabriel Johnson, Marilyn C. Hart (Advisor).

CHARACTERIZATION OF PROTEINS THAT INTERACT WITH THE ALPHA SUBUNIT OF ACTIN CAPPING PROTEIN. Ryan Raver, Joshua Kamrud, Dr. Marilyn Hart (Advisor).

IDENTIFICATION OF PROTEINS THAT INTERACT WITH ACTIN CAPPING PROTEIN. Nathan Martinez, Kevin Y.E. Strehler, Marilyn C. Hart (Advisor)

VISUALIZATION OF THE MICROVASCULATURE STRUCTURE OF THE RAT SCIATIC NERVE. Michael W. Witthaus, Adam W. Sudbeck, Dr. Michael Bentley (Advisor)

### **CHEMISTRY AND GEOLOGY**

Joseph Bequette, with faculty mentors Drs. Brian Groh and Danae Quirk Dorr, presented a poster on their work on the *Synthesis of 5-[5-(5-formyl-2-thienyl)-2-furyl]-2-thiophenecarbaldehyde* at the 233rd ACS National Meeting, Chicago, IL, March 28, 2007. Their synthesis accomplished the preparation of 3g of material, valued at \$45,000, for under \$500. This anticancer compound is being used in mechanistic pharmacological studies. Joe is an undergraduate student who will graduate spring of 2007 with a BS in Chemistry.

### **COMPUTER AND INFORMATION SCIENCES**

**Dr. Richard J. Roiger, Professor**, Mark Miller (P.T. Mankato Clinic OFC Back Care Center), Julie Morgan (P.T.A. OFC Back Care Center), and Faye Hudson (P.T.A. OFC Back Care Center), "Predicting Treatment Outcome for Patients with Low Back Injuries," to be presented at the 2007 International Conference on Data Mining, Las Vegas, Nevada, June 25-28.

**David J. Haglin, Professor** and Anna M. Manning, "On Minimal Infrequent Itemset Mining," in 2007 International Conference on Data Mining (DMIN'07), Las Vegas, June 25-38, 2007.

In an interdisciplinary effort, Dan Singer (Department of Mathematics and Statistics), David Haglin (Department of Computer and Information Sciences), and Anna Manning (School of Computer Science, University of Manchester) submitted a paper titled "Towards Average Case Analysis of Frequent Itemset Mining" to the 2007 International Conference on Data Mining (DMIN'07: June 25-28, 2007, Las Vegas). The paper has been accepted for oral presentation at the formal session and for publication in the proceedings.

### **MATHEMATICS AND STATISTICS**

**I.-J. Kim**, D.D. Olesky, B.L. Shader and P. van den Driessche, "Sign patterns that allow a positive or nonnegative left inverse", *Society for Industrial and Applied Mathematics (SIAM) Journal on Matrix Analysis and Applications*, Vol. 29, No. 2 (2007), 554-565.

Dr. I.-J. Kim has been accepted to participate in the Institute for Mathematics and its Applications (IMA) New Directions Short Course on Compressive Sampling and Frontiers in Signal Processing, June 4-15, 2007. This workshop

will be instructed by three leading researchers on Compressive Sampling; Drs. Candes (CalTech), DeVore (Univ. of South Carolina) and Baraniuk (Rice Univ.).

Dr. I.-J. Kim has submitted a manuscript entitled "Critical Sets of Inertias for Matrix Patterns" to the journal of *Linear and Multilinear Algebra*. This is a joint work with Drs. Olesky and van den Driessche at the University of Victoria, Canada.

Dr. Namyong Lee, Associate Professor, had a presentation "Innovative Ideas in Teaching Mathematics" at Mathematical Association of America's NCS NExT meeting at April 12, 2007. Also, his research paper, "A Micromechanical Modeling Technique Applied to Pultruded Composites Containing Clay Particles", with J. Park, was accepted for publication at the Proceedings of CANCEM, 2007.

A mathematics undergraduate student, Harrison Quick, was selected into the NSF funded Summer Undergraduate Research Program in Biostatistics at the University of Washington, Seattle. Harrison also participated in the NSF funded Bioinformatics research program last summer at the University of Wisconsin, Madison. Dr. Namyong Lee is his advisor.

"A Laguerre Polynomial Approximation for a Goodness-of-fit Test for Exponential Distribution based on Progressively Censored Data" has been accepted for publication in the *Journal of Statistical Computation and Simulation*; authors are **Deepak Sanjel**, Assistant Professor, and N. Balakrishnan.

In an interdisciplinary effort, Dr. Dan Singer, Associate Professor, Dr. David Haglin, Professor in Computer Science at MSU, and Anna Manning, School of Computer Science, University of Manchester, submitted a paper titled "Towards Average Case Analysis of Frequent Itemset Mining" to the 2007 International Conference on Data Mining (DMIN'07: June 25-28, 2007, Las Vegas). The paper has been accepted for oral presentation at the formal session and for publication in the proceedings.

### **MECHANICAL AND CIVIL ENGINEERING**

Civil Engineering junior Brad Fleming and Troy Downs, sophomores Andrew Bruels, Chris Bowers, and Mike Petersen were honored on April 26 at the Minnesota Surveyors and Engineers Society (MSES) scholarship banquet in Minneapolis. Since 2003, MSES has awarded 16 scholarships to MSU civil engineering students.

Dr. Aaron Budge, Assistant Professor, presented a paper coauthored by himself and Dr. Jim wilde, Associate Professor, entitled "Monitoring Curing of Emulsion-stabilized Roadways Using the Dynamic Cone Penetrometer" at the GeoDenver 2007 – New Peaks in Geotechnics conference of the GeoInstitute of ASCE. Held in Denver, CO in February.

Dr. Budge presented a case history in March at the University of Minnesota's 55th Annual Geotechnical Engineering Conference entitled "Large-span Culvert failures on the North Slope of Alaska."

Dr. Jin Park, Assistant Professor, together with Dr. Namyong Lee, Associate Professor of Mathematics, had a research paper, "A Micromechanical Modeling Technique Applied to Pultruded Composites Containing Clay Particles", which was accepted for publication at the Proceedings of CANCAM, 2007.

Park, J.Y. and Lee, Namyong, "Shape Effect of Platelet Clay Filler on Mechanical Behaviors of Pultruded Polymer Composites under Sheer Loading," was published in the Journal of Reinforced Plastics and Composites Vol. 26, No. 6, 2007.

#### **PHYSICS AND ASTRONOMY**

Louis Schwartzkopf, Professor, has published a book review of "Big Coal: The Dirty Secret Behind America's Energy Future, by Jeff Goodell" in *Physics & Society*, the newsletter of the Forum on Physics and Society, a division of the American Physical Society. The review can be found online from the American Physical Society homepage.

#### **CSET**

**Dean John E. Frey** is the recipient of an award for the Outstanding Academic and Student Affairs Administrator for 2007. This honor was conferred by the Academic and Student Affairs Division of the Office of the Chancellor of MnSCU (Minnesota State Colleges & Universities) at an awards ceremony on April 17 at the Minneapolis Community and Technical College. Dean Frey is being recognized for his leadership, innovation and integrity, and for his dedication to MSU and to the MnSCU System.