

# Recent External Research Awards

*For 2004–2005, the Russ College reported \$15.1 million in research and sponsored programs. Highlights of recent awards or award increments, listed with the researcher name(s) and affiliation(s), are:*

**Tony Adami** (Avionics Engineering Center): \$66,546 from a leading supplier of secure communications technology to develop a subset of flexible structure control that can be applied to gimbaled telescopes.

**Chris Bartone** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$73,936 from the U.S. Department of Transportation to determine whether the Wide Area Augmentation System (WAAS) satisfies performance requirements for maritime navigation and positioning applications.

**David Bayless** and **Greg Kremer** (Mechanical Engineering, Ohio Coal Research Center): \$79,931 from the Ohio Air Quality Development Authority to investigate electrostatic separation for hot gas clean up in coal gasification.

**Gerardine Botte, Michael Prudich** (Chemical Engineering, Coal Research Center), **David Bayless** (Mechanical Engineering, Ohio Coal Research Center), and **Andrew Foley**, (Mechanical Engineering), \$34,736 from the National Science Foundation (through Stark State College of Technology) to implement fuel-cell related curricula.

**Michael Braasch** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$25,000 from an aerospace products and services company for continuing grant support for the work in Global Positioning System (GPS)/inertial applications.

**Curt Cutright** (Avionics Engineering Center): \$40,661 from an aerospace products and services company for the flight test of a navigation sensor.

**Michael DiBenedetto** (Avionics Engineering Center): \$225,000 from the Federal Aviation Administration (FAA) to provide navigation and landing analytical, mathematical modeling, and technical/engineering support including theoretical analyses, exploratory studies and experiments for the FAA's Office of Spectrum Policy and Management.

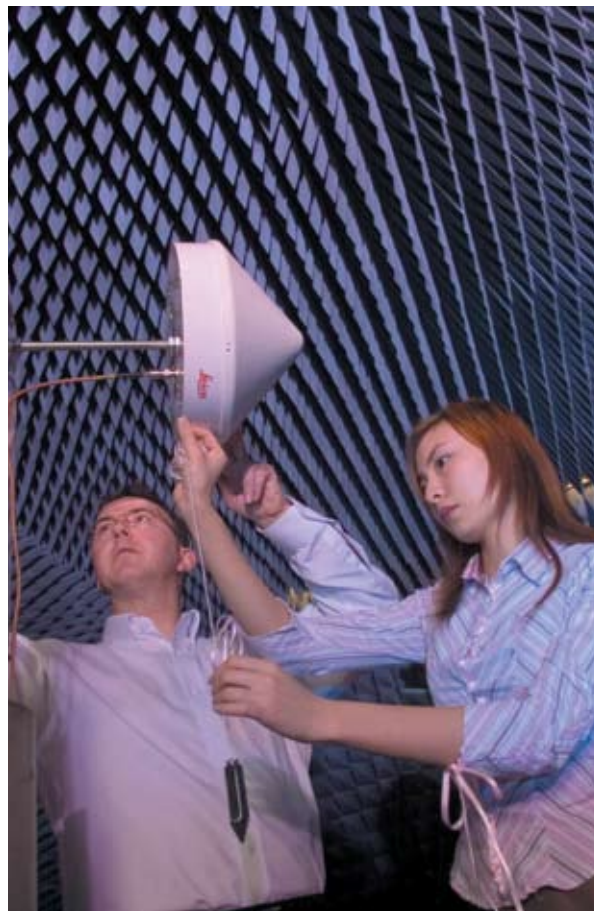
**Michael DiBenedetto** (Avionics Engineering Center): \$65,870 from the National Air Traffic Services, United Kingdom, to derive optimized site-specific azimuth and elevation signal protection volumes for the microwave landing systems to be installed at London's Heathrow Airport.

**Jeffrey Dill** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$50,000 from a global aviation electronics company to design and optimize circular trellis coding in the tactical targeting network technology program.

**Tingyue Gu** (Chemical Engineering, Institute for Corrosion and Multiphase Technology): \$3,000 from the University of Texas M.D. Anderson Cancer Center to test a novel chemical enhancement agent in the mitigation of biocorrosion.

**Tingyue Gu** (Chemical Engineering, Institute for Corrosion and Multiphase Technology): \$16,968 from Millipore Corporation to perform mathematical modeling and parametric studies of biomolecular separation using adsorption, in which biomolecules selectively bind with a solid medium.

**Tingyue Gu** (Chemical Engineering, Institute for Corrosion and Multiphase Technology): \$50,000 from a leading oil and gas producer and gasoline retailers to study biocorrosion problems in the hydrotesting of subsea pipelines.



Chris Bartone, associate professor in the School of Electrical Engineering and then-Ph.D. candidate Ujijie Zhang, M.A. '03, Ph.D. '05, work in the College's antenna anechoic chamber.

**Trevor Hale** (Industrial and Manufacturing Systems Engineering): \$6,649 from a leading global products and services company's global research center to study collaborative decision making with the goal of improving agile combat support systems.

**Robert Judd** and **Dale Masel** (Industrial and Manufacturing Systems Engineering): \$255,000 from a leading global products and services company to continue developing better methods of estimating the cost of jet engines early in the preliminary design stage.

**Frank Kraft** and **Jay Gunasekera** (Mechanical Engineering): \$47,256 from the Edison Materials Technology Center via the Queen City Forging Company to develop new heat treating cycles for aluminum alloy forgings using rapid infrared heating, to improve mechanical properties and to promote energy and manufacturing cost savings.

**Gregory Kremer** and **David Bayless** (Mechanical Engineering, Ohio Coal Research Center), and **Morgan Vis-Chiasson** (Environmental and Plant Biology, Ohio Coal Research Center) and **Ben Stuart** (Civil Engineering, Ohio Coal Research Center), \$50,000 from the Department of Energy to study photosynthetic carbon sequestration as a way to reduce greenhouse gas emissions and perhaps reduce global warming.

**Gregory Kremer** and **David Bayless** (Mechanical Engineering, Ohio Coal Research Center), and **Morgan Vis-Chiasson** (Environmental and Plant Biology, Ohio Coal Research Center), \$15,000 from the University of Nevada at Reno to study the process of converting sunlight into algae.

**Douglas Lawrence** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$32,945 from Austral Engineering and Software and \$337,188 from the U.S. Air Force and Defense Advanced Research Projects Agency (DARPA) to develop adaptive guidance and control systems for reusable launch vehicles that accommodate unforeseen damage or malfunction.

**David Matolak** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$75,000 from NASA Glenn Research Center for NASA's Advanced Communications, Navigations, Surveillance Architecture and Systems Technology (ACAST) Program, to help develop standards for design of future wireless communication networks at airports.

**David Quinet** (Avionics Engineering Center): \$1,231,523 and \$2,087,989 from the FAA to research the modernization, certification, operation, and maintenance of the National Airspace System navigation and landing systems.

**Shad Sargand** (Civil Engineering, Ohio Research Institute for Transportation and the Environment): \$1,800 from the Ohio Department of Transportation (ODOT) to determine most economical way to replace a bridge damaged by heavy rains.

**Shad Sargand** (Civil Engineering, Ohio Research Institute for Transportation and the Environment) and **William Edwards** (Ohio Research Institute for Transportation and the Environment): \$90,871 to continue collecting data on the strategic highway research program (SHRP) test road in Delaware County and combine with existing data to create a comprehensive Ohio SHRP

test road database, continuously update the database with new data, monitor pavement, collect data at selected additional sites, and conduct forensic investigations of failed sections.

**Ben Stuart** (Civil Engineering, Ohio Coal Research Center), et al: \$869,440 from the U.S. Environmental Protection Agency to support a watershed classification system to predict habitat variables and help identify impaired streams in the Western Alleghenies.

**Robert Thomas** (Avionics Engineering Center): \$176,289 from Virginia Satslab Inc. to provide flight evaluation planning and execution as the lead organization for demonstrations of small aircraft transportation system higher volume operations.

**James Thompson** (Civil Engineering): \$18,000 from the Precast Prestressed Concrete Institute to experimentally validate a proposed design procedure for inverted tee girders with web openings, girders designed to allow ducts and pipes to pass through beam rather than going underneath.

**Frank Van Graas** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$42,840 from the Dayton Area Graduate Studies Institute to investigate an active optical sensor system concept integrated with an Inertial Navigation System (INS) to greatly reduce the error growth of the INS.

**Frank Van Graas** (Electrical Engineering and Computer Science, Avionics Engineering Center): \$1,900,000 from the FAA to research architectures for the local area augmentation system in order to minimize multipath and interference.

**Valerie Young** (Chemical Engineering): \$49,446 from the National Science Foundation to determine levels of bromine and chlorine atoms in the Arctic springtime atmosphere, which is critical to understanding the regional and global behavior of mercury in the atmosphere.

**Helmut Zwahlen** (Ohio Research Institute for Transportation and the Environment): \$41,668 from ODOT to determine crash reduction factors for education and enforcement strategies.

**Helmut Zwahlen** (Ohio Research Institute for Transportation and the Environment): \$30,817 from ODOT to measure work zone traffic flow and create software to model work zone traffic flows.

**Helmut Zwahlen** (Ohio Research Institute for Transportation and the Environment) and **Gayle Mitchell** (Civil Engineering, Ohio Research Institute for Transportation and the Environment): \$239,428 from ODOT to collect and analyze data from road weather information system stations equipped with bridge temperature simulators and pavement sensors installed on bridges and possibly roadways, in order to determine how bridge temperature simulator and bridge sensor readings can be used to guide winter maintenance activities. 

**For proprietary reasons, some research sponsors prefer we not release their names when reporting on our research. In those cases, a general description of the organization is used instead of the name.**



**Trevor Hale**, assistant professor in the Department of Industrial and Manufacturing Systems Engineering, investigates the use of Voronoi diagrams to help solve supply chain-related problems.