

TRANSMISSIONS

Tragedy and **Community**



By now, most alumni and friends of the ECE department know of the tragic death of Professor Denise Nicoletti on Monday, July 22, 2002. Denise had welcomed the participants and parents of Camp Reach the previous afternoon, and was on

her way from home to the first full day of camp when she died in an auto accident. The loss of Denise is still hard for us in the department to comprehend, and her absence is all too evident.

While no one can replace Denise, her spirit and ideals are truly alive in ECE and across WPI. Responding to this loss, the WPI community demonstrated its tremendous strength in tragedy as well as in success, conducting the sixth annual edition of Camp Reach in a positive and successful manner. The camp will continue under the direction of co-founder Chrys Demetry and Denise's activities in ECE, particularly WECE (Women in Electrical and Computer Engineering) are vibrant. Denise received (posthumously) two major National Science Foundation grants, totaling over \$1M, for proposals she had submitted. The NSF has agreed to transfer the role of principal investigator to other faculty so that this work also will continue.

All of the ECE faculty and staff are committed to continuing Denise's work to make the electrical engineering profession, and the ECE department, a welcoming place for women. The fact that only about

10 percent of our students are females is disappointing; it is small comfort that this number matches the national average. Locally, and nationally, we need to work to change this situation. We would appreciate the help of our alumni (both male and female) in this effort.

As *The Campaign for WPI* comes to a close, I would like to thank the corporations and individuals who have made contributions in 2002 designated specifically to the ECE department: Intel and Verizon corporations and the following alumni: Gary Krumpholz, Earle Laste, Steven Silva and Steven Staudaher. Of course, many other ECE alums made contributions to other purposes at WPI. It's not too late to help the campaign exceed its goal of \$150,000,000!

The past 15 years as head of ECE have been extremely rewarding for me. I really believe that being department head is a fantastic job, particularly with the great faculty, staff, students and administration with which WPI is blessed. It is tempting to continue, but the time has come for a change. A search for the next department head is now going on, and he or she will take over on July 1, 2003. I look forward to reading the thoughts of the new ECE head in the next issue of *Transmissions*.

John A. Orr

Faculty Notes



Bitar

Brown

Emanuel

King

New Faculty Assistant Professor **Brian King '93** (EE/CS) earned his master's in EE at WPI in 1995. He then left to study at the University of Arizona, undertaking thesis research in the area of high-capacity digital storage. After receiving the Ph.D. in 2000, he joined In-Phase Technologies in Colorado, where he applied his expertise in research and development of optical storage devices for commercial use. Brian's areas of expertise are broad, encompassing computer engineering, photonics and coding theory. At WPI he is focusing on the promising new area of photonic crystals, particularly including development of the computer models and simulation tools for engineering photonic crystal components. Assistant Professor **Demetrios Papageorgio** received his degrees at the University of Michigan—B.S. '95, M.S. '97, Ph.D. (EE/CS) '01. His doctoral research included the design, fabrication and testing of micromachined MEMS chemical delivery components (including valves, pumps and flowmeters) for neural implantation. This interdisciplinary area has stimulated the breadth of his interests: VLSI design and fabrication as well as analog microelectronics, micro-electromechanical systems (MEMS), and Bioengineering. Demetrios has entrepreneurial experience in optical communications and design experience at MEMSIC Inc., where he was responsible for design and testing of MEMS accelerometers.

Awards Assistant Professor **Berk Sunar**, along with two other members of the WPI faculty, were selected by the National Science Foundation for prestigious Faculty Early Career Development (CAREER) awards. This NSF award recognizes Berk as a young faculty member with unusual promise as a researcher and teacher-scholar who is likely to become one of the academic leaders of the 21st century. His grant is for research in "New Directions for Cryptographic

Hardware" and represents \$330,000 over five years. Across all of WPI over the past eight years, 15 WPI professors have received CAREER awards, including three in ECE. William Durgin, WPI's associate provost for academic affairs notes that "this is an impressive number for a small university, and a reflection of the university's success in attracting outstanding educators and researchers to its faculty." Berk is the director of WPI's Cryptography and Information Security Research Laboratory.

The Joseph Samuel Satin Award for 2002-03 was presented to Assistant Professor **Donald R. (Rick) Brown** last April. Rick arrived at WPI in the fall of 2000 after receiving his Ph.D. at Cornell, and during his first two years he has demonstrated his great enthusiasm for the academic environment at WPI, and his real abilities in teaching and research. He has taken on important and challenging courses in communications and computer engineering at the undergraduate and graduate levels. He has carried out substantial redevelopment of those courses, and shows his teaching abilities in both lecture and laboratory environments. He is also substantially involved with project work—at the Ireland and London sites, and on campus with corporate-sponsored (GE) projects.

Rick is developing an excellent research record in the wireless communications area, with recent publication of journal papers as well as a book chapter and conference papers. He and Professor Reinhold Ludwig have received a research grant from DARPA (Defense Advanced Research Projects Agency) for work on an innovative means of capturing speech in a high-noise environment by electromagnetically sensing changes in the vocal tract.

The Satin Award was inaugurated in 1982 and provides approximately \$20,000 for the recipient to use in advancing research and teaching activities at WPI.



Michalson

O'Rourke

Pahlavan

Papageorgio

Sunar

Recognition In the past year, instructor **Stephen Bitar** received the Eta Kappa Nu Outstanding Teacher Award. **Donald (Rick) Brown** received the Sigma Phi Epsilon Faculty Appreciation Award. **Alex Emanuel** was elected to Skull, the WPI honorary society. **William Michalson**, chief technical officer of American Navigation Systems Inc., shared in the acceptance of first place in the WPI Venture Forum's 2002 Business Plan Contest. (AMNAV received \$15,000 in cash and in-kind services.) **Denise Nicoletti** and senior electrical engineer **James O'Rourke** were recognized for their dedicated service to ECE and WPI in the inaugural IEEE Community Service Awards. **John Orr** was elected a fellow of the IEEE for his contributions to engineering education. (Other IEEE fellows at WPI include Edward Alton Parrish, William Grogan, Kevin Clements, Alexander Emanuel, Kaveh Pahlavan and Robert Peura.) **Kaveh Pahlavan** was appointed to the Technical Advisory Board of Global Communication Devices (GCD), a fabless supplier of highly integrated semiconductor devices for wireless networking applications.

It's easy to stay up to date on department activities by visiting us online. You may get there directly at www.ece.wpi.edu or from WPI's home page www.wpi.edu

We enjoy comments from our alumni and other readers.

Let us hear from you via the Alumni Corner of the ECE Web pages.



Denise Nicoletti in the lab during Camp Reach 1999

Professor **Denise Nicoletti** lost her life in an automobile accident on Monday, July 22. She was on her way to the first day of Camp Reach 2002.

Denise came to WPI in 1991, the first tenure-track female faculty member in the history of the department. An authority on ultrasonics, nondestructive testing, scaling and fractal properties, the assessment of student learning, and the promotion of science and engineering to underrepresented groups, she was published widely in academic journals and conference proceedings. In 1992 she won the Eta Kappa Nu Award for Outstanding Teaching, and in 1993 was awarded the Joseph Samuel Satin Distinguished Fellowship. Last year she received the WPI/IEEE Community Service Award.

In 1997 Denise, together with Professor Chrysanthe Demetry of the ME Department, created Camp Reach at WPI. (The sixth installment of this acclaimed summer program, which introduces seventh grade girls to the excitement of engineering and science, sadly began without her on that Monday.) In 1998 she created WPI's WECE (Women in Electrical and Computer Engineering) organization to support and inspire WPI's female ECE students. She was a member of the Institute of Electrical and Electronics Engineers, the Acoustical Society of America, the American Society of Nondestructive Testing, the Society of Women Engineers, the American Society of

University Women, the Women in Engineering Programs Advocates Network, and the Tau Beta Pi, Eta Kappa Nu and Sigma Xi honor societies. Outside WPI, she was the treasurer and webmaster of the First Congregational Parish, Unitarian Church of Petersham. She had served on the town's library board. In addition to her professional work, her passions included gourmet cooking, gardening and tailoring.

Denise was born in Yakima, Wash. As a DJ for a college radio station, she developed an interest in sound that led her into an electrical engineering program at George Washington University. She received her B.S., M.S. and Ph.D. degrees in electrical engineering from Drexel University. She was the recipient of the Outstanding Graduate Student Award and the Outstanding Teaching Assistant Award, and gave the graduate student address when she received her Ph.D.

Denise Anne Wawrzynski Nicoletti is survived by her husband of 14 years, Richard Nicoletti, twin sons born in 1998, Lucio and Marcello, and a daughter born in 1996, Celeste. A son, Giancarlo, died in 1995. She also leaves her mother, Barbara Broad, her father, Chester Wawrzynski, a brother, Vincent Wawrzynski, and two sisters, Alexandra Wawrzynski and Stephanie Finander, all of California.

Several ECE students received awards in 2001–02:

Matthew Douglas '02, Jason Brown '02

Salisbury Prize (WPI's premier undergraduate academic award)

Nina K. Simon '03

Two Towers Prize (awarded to the third-year student who best exemplifies the Two Towers tradition).

Nina also received the United Technologies Corp. and the Society of Women Engineers Award (awarded to an outstanding female undergraduate student).

Jason Brown '02

Eduardo Paredes '03

GE Fund Scholarship for the 2001–02 academic year in recognition of their outstanding academic performance

Andrey Berezin '03

IEEE Antennas and Propagation Society scholarship

Samuel Adams Tannatt '02

Eta Kappa Nu Outstanding Senior Award

Jennifer Scheipers '03

undergraduate student IEEE/ECE Community Service Award

David Holl

graduate student IEEE/ECE Community Service Award

Provost's MQP Awards (also ECE Alumni MQP Awards) to these members of the Class of 2002:

First Place: **Pavel A. Loven, Andrew S. Young**, "Handspring Digital Multimeter" (W. Michalson)

Second Place: **Matthew T. Kling, Kevin D. Jorczak, Daniel C. Nelson**, "Remote Control Oxygen Regulation System," (R. Vaz)

Third Place: **Lee Fisher, Kevin Keenaghan, John Roach**, "Remote Surveillance System Over GSM Network," (R. Vaz)

ABET Reviews EE and New ECE Programs

A team of evaluators led by Professor Jamie Rogers of the University of Texas at Arlington visited WPI Dec. 8–10 to review all of WPI's engineering programs for continued accreditation by ABET. At least once every six years ABET, the engineering accrediting body in the United States visits each accredited program.

At the last visit, in 1996, WPI was one of two pilot universities evaluated under a groundbreaking set of outcomes-based criteria. That visit went very well for Electrical Engineering, but at the visit six years later the team would be looking for an even more complete implementation of the criteria that require programs to demonstrate that students actually *achieve* the stated program outcomes and objectives, rather than merely receive passing grades in courses. Also, ECE had a brand-new program up for review: the new major in electrical and computer engineering that was described in past newsletters.

We had two excellent visitors, one for EE and one for ECE, who carefully reviewed our documentation and spent an intense period interviewing students and faculty and evaluating our facilities. While the official report on both programs will not be received until summer, the exit statements by both visitors were very positive and all aspects of the visit went exceedingly well. Our new major in ECE appears to be off to an excellent start!

Lincoln Laboratory Project Site Launched

Joining NASA Goddard Space Flight Center, Ireland and Silicon Valley is ECE's newest off-campus site for our senior-level engineering projects: Lincoln Laboratory. This world-renowned research facility is operated by MIT and is the recognized leader in advancing the state of the art in radar and other areas of communications and signal processing. Lincoln Laboratory is located about 45 miles from WPI in Lexington, Mass., so students were able to commute daily during B-term (Oct.–Dec. 2002) for full-time project work. Three teams of three students each (six from ECE and three from Computer Science) worked on projects in hyperspectral imaging, monopulse radar receiver design, and Java browser tools for ballistic missile defense analysis. The combination of practical engineering design with leading-edge applications provided experience for the students that they could not have obtained in any other way. The mentoring by recognized authorities in each project area has jump-started these nine students on their careers. Professor Kevin Clements directs the project center. Student interest in this new project center has been high, with a competitive selection process for next year now under way.

Newell Award

In April, **Michael J. Grady '71** was presented with the Hobart Newell ECE Alumni Award for outstanding professional contributions.

Throughout his career, Mike Grady has been at the forefront of innovation in the computer and telecommunications industries. Early in his career he joined Stratus Corporation as one of the founding engineers. That position afforded him the opportunity to help design and build the Stratus Fault-Tolerant Operating System that made Stratus a world leader in fault-tolerant computing, a position it continues to hold today, with a worldwide customer base including the largest stock exchange in Asia. In 1992 he joined Wellfleet Communications and built an engineering team of 60 to one of more than 400 highly talented engineers and managers. When Wellfleet merged with SynOptics Communications, he took on the position of senior vice president of engineering in the newly formed company Bay Networks.



Returning to his entrepreneurial roots, Mike founded Argon Networks, developing high-performance core routers for the backbone of the Internet. It was the success of that company that led Siemens to acquire Argon as part of the formation of Unisphere Networks. After that successful acquisition, Mike again turned his leadership skills and entrepreneurial spirit into a startup venture, Chinook Communications, where as executive vice president of engineering he helped develop revolutionary solutions for the broadband cable market.

Michael Grady's vision and thoughtful approach to the challenges in the computer and telecommunications fields during the past three decades truly represent the excellence in professional accomplishments that the Newell Award is intended to recognize.

Over 100 faculty and alumni were present at the banquet and presentation of the 12th annual Newell Award. The range of class years represented was very broad and provided an opportunity both to renew old acquaintances and to make some new ones while celebrating the success, not just of the Newell recipient, but of ECE graduates, in general.

Previous recipients of the Newell Award include William R. Grogan '46, Paul A. Allaire '60, Ronald L. Zarrella '71, Robert E. McIntosh Jr. '62, John Lott Brown '46, Donald H. Foley '66, H. Richard Freeman '61, Peter B. Myers '46, Alfred A. Molinari Jr., '63, John C. Petrillo '71 and Robert Woog '68.

Alumni Awards

The WPI Alumni Association recognized four ECE graduates at Reunion 2002. We are proud of their professional accomplishments.

Daniel A. Funk '77 and **Paul A. Lacouture '72** received the Robert H. Goddard Award for Outstanding Professional Achievement.

Charles M. Stasey '57 received the Herbert F. Taylor Award for Distinguished Service to WPI.

Donald P. Zereski '87 received the Ichabod Washburn Young Alumni Award for Professional Achievement.

Nominations

of WPI ECE alumni

for the

Newell Award

are welcome.

Please e-mail John Orr

at orr@wpi.edu

with the nominee's name

and a brief description of

her/his accomplishments.

ECE Grad Student Research Day

In the past, the innovative and creative research work of our graduate students has not been very visible beyond their particular laboratory.

To help change that, the first ECE Graduate Student Research Day was held April 16, 2002, with poster presentations from more than 20 M.S. and Ph.D. students. The posters were judged by a faculty panel on both the work itself and the effectiveness of the presentation, with cash awards sponsored by Aware Inc.

This will be an annual event, held in parallel with project presentations by our undergraduates. The second Graduate Student Research Day is April 15.

Winners (and their advisors) last year were **Georg Luenberger** (Reinhold Ludwig), first place; **Michael Shear** (Peder Pedersen), second place; and **David Holl** (David Cyganski), third place.



George Luenberger, right, with Fred Looft and Peder Pedersen

Research and Innovation

Untethered Healthcare Receives Funding

The Center for Untethered Healthcare, directed by ECE professor William Michalson, has been launched with a major grant. This research center began in the ECE department and now functions as a unit of the new WPI Bioengineering Institute. The award, from the U.S. Army Medical Research and Materiel Command (USAMRMC) at Fort Detrick, Md., provides over \$800,000 to fund the first year of what is expected to be a multi-year commitment. The Center for Untethered Healthcare will oversee the development of real-time monitoring system using new sensor and wireless communications technologies to remotely track health data and assess injuries, for both the military and civilian population. The new grant, entitled Real-Time Troop Physiological Status Monitoring System Using a Common Wireless Network, was secured by a multidisciplinary team of three WPI researchers, William R. Michalson, associate professor of electrical and computer engineering, Yitzhak Mendelson associate professor of biomedical engineering, and Peder C. Pedersen, professor of electrical and computer engineering. This study will serve as the foundation in the development of a communication system that integrates new sensor technologies for real-time troop status monitoring, together with a wearable ultrasound imaging system, used by medics for improving remote injury assessment, into a common wireless network. The objective of this one-year program is to investigate and initiate the development of key components of the communication system that lie in three technology areas: low-level, wearable, vital sign sensors; human-machine interfaces and diagnostic algorithms to enhance field operation of the ultrasound imaging system; and low maintenance, field deployable computer, communications and positioning networks.

Another major component of the Bioengineering Institute is the Center for Comparative NeuroImaging, co-directed by ECE professor Reinhold Ludwig. CCNI's goals include improvement of our knowledge about mental illnesses and ailments like depression, addiction, stress and aggression, and furtherance of cancer research. Founded in 2001, CCNI is a joint venture between WPI and the University of Massachusetts Medical School, Department of Psychiatry. It was established to study the etiology and pathophysiology of mental illness using non-invasive ultra-high-field magnetic resonance (MR) imaging. Professor Ludwig concentrates on advanced coil and RF electronics design for these state-of-the-art instruments.

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ECE Inaugurates Grad Program in **Info Security**

Last fall ECE launched the Boston area's first-of-its-kind Graduate Certificate Program in Information Security, and this semester more than 80 students are enrolled. ECE has a recognized leadership position in both research and graduate education in cryptography and information security, and this new certificate program makes faculty expertise available to working professionals at WPI's Waltham campus as well as in Worcester.

Graduates of the program will be prepared for technical leadership positions in design, implementation, analysis and management of secure information systems. The program's courses provide the vital theoretical and practical preparation to combat real-world information security attacks, bridging the disciplines of computer science and electrical and computer engineering. They cover important aspects of computer and network security, cryptography, computer forensics, risk assessment, disaster recovery, and law and regulation. A Graduate Certificate is granted after completion of a four-course program of study. The courses may also be applied to an M.S. degree program at WPI.

The faculty for the WPI's Information Security Program is a combination of leading industry and academic figures. Coordinator of the program is Richard A. Stanley, CISSP, a practicing information security professional with many years of public and private sector experience, and an adjunct assistant professor of electrical and computer engineering at WPI. Other program faculty include

Berk Sunar, director of WPI's Cryptography and Information Security Laboratory and assistant professor of electrical and computer engineering; and William Martin, researcher in combinatorial mathematics and cryptographic systems, and associate professor of mathematics at WPI.



conference focused on innovations and new directions in engineering and computer science—a record 625 educators and industry representatives from the United States and around the world gathered at the Park Plaza hotel in Boston.

Interactive preconference workshops included programs as varied as applying software engineering principles to course development to building your own personal robot. Program presentations and panels included advanced classroom technology, retention of underrepresented students, teaching entrepreneurship and invention, and K-12 initiatives to increase the pool of students considering engineering.

Keynote speaker Robert Lucky opened the conference with a combination of historical perspective, vision and humor that stimulated every attendee's desire to contribute to the advancement of engineering education. Lucky is recently retired as corporate vice president of applied research at Telcordia Technologies, a member of the National Academy of Engineering and an IEEE fellow.

General chair of FIE 2002 was John Orr.

New Research Grants

Michalson, W. (Co-PI) and **C. Ruiz** (PI), "Norfolk County Sheriff's Office Data Base Development," Norfolk County Sheriff's Office, \$14,866, February 2002.

Pedersen, P., W. Durgin (Co-PIs) and **J. Hermanson** (PI), "Stability and Heat Transfer Characteristics of Condensing Films in Reduced Gravity," NASA, (continuation) \$79,445, February 2002; (continuation) \$79,935, March 2002.

Ludwig, R., "Feasibility Study to Develop RF Coils for High-Field MRI," UMass Medical School, \$9,456, March 2002.

Makarov, S., "Comparative Study of Different Radiating Elements for a Low-Cost Wideband Wide-Angle Scanning Array in the Band 120-240 MHz," MIT, \$23,423, April 2002.

King, J. (PI) and **S. Makarov** (Co-PI), "9.4T a Micro-Imaging Spectrometer for High Field Imaging," (UMass Medical Center and WPI), NSF, \$250,000, May 2002.

Makarov, S., "Patch Antenna Modeling with Surface/Volume RWG Elements," National Research Council Summer Faculty Fellowship, Hanscom AFB-AFRL (Antenna Division), \$13,000, Summer 2002.

Cyganski, D., "Performance Enhancing Protocol for Military Satellite Communications," Raytheon, \$84,500, July 2002.

Nicoletti, D.W., D.R. Brown and **A. Emanuel**, "Using Assessment Information to Enhance Students' Learning," NSF, \$99,976, July 2002.

Sunar, B., "CAREER: New Direction in Cryptographic Hardware," NSF, \$330,000, August 2002.

Clements, K.A., "Stochastic OPF and Transaction Monitoring in Deregulated Power Systems," NSF, \$73,445, September 2002.

Brown, D.R., and **R. Ludwig**, "Robust Measurement of the Glottal Waveform," DOD/DARPA, \$122,991, October 2002.

Michalson, W., and **P. Pedersen**, "Real-Time Trop Physiological Status Monitoring System," DOD/Army, \$827,000, November 2002.

Cyganski, D., "Power Law Scatter Models and Non-Linear Estimation," MIT Lincoln Labs, \$134,984, December 2002.

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