

DREXEL

ECEngineer

A NEWSLETTER FOR ALUMNI AND FRIENDS OF THE DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING • DREXEL UNIVERSITY • SUMMER 2003

DEPARTMENT HEAD'S

Message



Nihat Bilgutay

It is my pleasure to present the fourth edition of *ECEngineer*. This newsletter gives the department the opportunity to report on our notable achievements, major events and the activities of our faculty, students and alumni, all of which continue to make the ECE Department successful and a key member of the University community.

We have witnessed a considerable increase in enrollment, at both the undergraduate and graduate levels. In fall 2002, freshmen undergraduate enrollment increased 15 percent, and new graduate enrollment rose 20 percent compared to the previous year. ECE is currently the largest department in the University.

We have also experienced tremendous growth in our educational and research activities. ECE accounted for approximately 30 percent of the University's and 50 percent of the College of Engineering's research awards in fiscal year 2002. The department's research awards totaled \$15 million, and research expenditures reached \$11.5 million.

Other notable achievements include the completion of renovations to our undergraduate teaching laboratory, providing our students with state-of-the-art facilities that will help our program stand out nationally, and our successful Accreditation Board for Engineering and Technology review. ABET accredited the electrical engineering program, and for the first time the computer engineering program, for a full six-year term, through September 2008.

Our faculty members continue to distinguish themselves internationally through their research and professional achievements. Dr. Arye Rosen was elected to the highly prestigious and selective National Academy of Engineering, joining Dr. Stewart Personick as the second NAE member from the ECE Department. Dr. Eli Fromm, last year's inaugural recipient of the NAE's coveted Bernard M. Gordon Prize, was elected as a fellow of the International Engineering Consortium, and Dr. Bruce Eisenstein was elected as the East Region Director on the Board of Directors of Eta Kappa Nu. Our students also received numerous national awards, most notably two Graduate Research Fellowships from the National Science Foundation and two National Defense Science and Engineering Graduate Fellowships, both of which are highly competitive and prestigious. These accomplishments continue to enhance our national reputation, visibility, growth and success and our ability to attract the highest caliber faculty and students.

It is my pleasure to share with you developments in the department through this issue of *ECEngineer*. Please visit our Web site, www.ece.drexel.edu, which features the most recent news and events.

Nihat Bilgutay

ACIN Receives \$10 Million in Phase III Funding

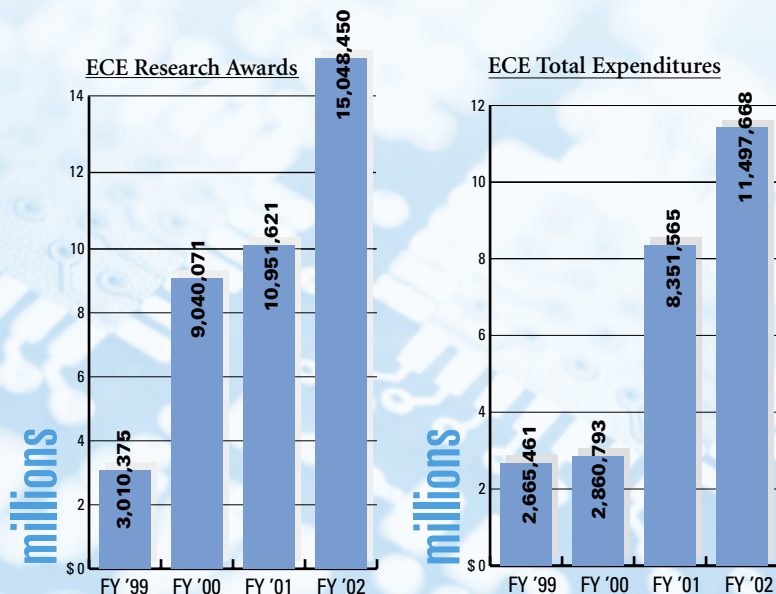
The Applied Communication and Information Networking program received \$10 million in additional Defense Department funding in February 2003, for its third phase. The program's first two phases received more than \$17.5 million in funding. ACIN is managed by Drexel University in partnership with Sarnoff Corporation. The Army's Communications-Electronics Command is the government executive agent for the program. The ACIN program was initiated to address the challenge posed in the National Research Council report, *Realizing the Potential of C4I: Fundamental Challenges*, to "enable war fighters to revolutionize military doctrine and methods of operation by employing rapidly advancing commercial communication and information networking technologies through innovative applications of those technologies."

According to Dr. Stewart Personick, E. Warren Colehower Chair Professor and general manager of ACIN, "Research-and-development projects being led by Drexel in ACIN phase 3 address two key challenges: wireless communication by soldiers on the move in subterranean and dense urban environments, and secure, reliable, access-controlled communication among soldiers who are members of heterogeneous teams that continually merge into larger teams and disperse into smaller teams in fast-moving military operations."

"For the first challenge," said Dr. Personick, "Drexel is determining the effectiveness versus more routine approaches of employing combinations of spatial-temporal signal processing, adaptive antennas and relaying methods to enable dependable, secure, on-the-move communication in non-line-of-sight situations. Drexel's faculty includes several of the world's leading researchers in these technologies and methodologies." The principal investigator for this research-and-development project is Dr. Kapil Dandekar. He will be working closely with project task leaders Dr. Athina Petropulu and Dr. Afshin Daryoush.

"For the second challenge," Dr. Personick continued, "Drexel is combining leading-edge commercial distributed-networking technologies and methodologies with innovative security, access control and intrusion detection technologies and methodologies, to create the necessary secure and dependable group communication capabilities." The co-principal investigators for this project are Dr. Moshe Kam, Robert G. Quinn Professor, and Dr. William Regli, associate professor of computer science and mechanical engineering and mechanics.

Research Awards and Expenditures Continue to Grow





ECE BUZZ

Alumni Brunch



Blue & Gold Days 2003, held May 2-3, offered ECE alumni the opportunity to see new developments at Drexel and connect with old friends. ECE hosted a champagne brunch on Saturday, May 3, allowing alumni to reunite with faculty, advisors and classmates. Left to right: Nihat Bilgutay, Tendai Mafarachisi '93 and son, Christopher Lewis '93, Sue Grunza and Steve Grunza '93 with Steve Jr., Oleh Tretiak.



Dr. Bruce Eisenstein

Eisenstein Receives Robert Quinn Medal

Dr. Bruce Eisenstein, Arthur J. Rowland Professor, received the College of Engineering's Robert Quinn Medal for distinguished service to the College and Drexel University. The award is named in honor of the late Robert Quinn, a co-founder of the Enhanced Educational Experience for Engineers Program (E⁴), which is known today as the Drexel Engineering Curriculum (tDEC). Dr. Quinn's impact on engineering education is greatly respected. The E⁴ curriculum was designated a national model for undergraduate engineering education by the National Science Foundation, and is emulated by universities worldwide.

The Robert Quinn Medal is given to an individual whose outstanding leadership echoes that of Dr. Quinn. Dr. Eisenstein's extensive involvement in organizations including IEEE and Eta Kappa Nu, and his years of dedication to the

University, make him a deserving recipient. His numerous professional achievements include election to the Board of Directors of Eta Kappa Nu, service as IEEE president in 2000 and selection as Delaware Valley Engineer of the Year for 2000-01.

Electrical and Computer Engineering Fellowship Fund

Over the past five years, the ECE Department has shared in Drexel's renaissance. From capital improvements and increased enrollment, to program initiatives and advanced research, Drexel and ECE experienced historic growth. And this is only the beginning. The department has established an ECE Strategic Plan, which includes the establishment of the Electrical and Computer Engineering Fellowship Fund. This endowed fund, created with the support of several faculty members, will be used to recruit outstanding graduate students to ECE.

The department is asking for alumni to participate in its vision and maintain momentum, through volunteerism and by contributing to the Electrical and Computer Engineering Fellowship Fund. Every gift is meaningful and emphasizes the commitment of ECE alumni to the enhancement of the department's reputation. Alumni can contact Lydia Kokolskyj with inquiries, at Lydia.D.Kokolskyj@drexel.edu or 215-895-2611.

ECE Faculty and Staff Recognized at CoE Honors Day

The 2003 College of Engineering Honors Day held on February 19 honored faculty, staff and students for their contributions to the excellence of the College. The ECE Department was well represented among this year's honorees: Dr. Bruce Eisenstein received the Robert Quinn Medal for Outstanding Leadership, Dr. Peter Herczfeld the Research Accomplishment Award, Wayne Hill the Technical Staff Accomplishment Award and Dr. P. Mohana Shankar the Service Accomplishment Award.

International Microwave Symposium in Philadelphia

The International Microwave Symposium 2003 took place June 8-13 at the Philadelphia Convention Center, including a main conference and two satellite conferences, Radio Frequency Integrated Circuits and Automatic RF Techniques Group. Total attendance was between 11,000 and 15,000, with close to 1,000 technical presentations, 38 workshops, numerous panel sessions and a variety of technical and social activities. Exhibits included between 800 and 900 booths.

IMS is run under the auspices of the IEEE Microwave Theory and Techniques Society, which is one of the largest, oldest and most prestigious engineering societies.

The faculty, students and alumni of Drexel's Center for Microwave-Lightwave Engineering, which is part of the ECE Department, played a major role in the planning and execution of the conference. Dr. Peter Herczfeld, director of the center and Lester A. Kraus Professor, chaired the Technical Program Committee, and Dr. Arye Rosen, Academy Professor of Electrical and Computer Engineering and Biomedical Engineering, was the co-chair. Dr. Arthur Paoletta (Ph.D. '92) was in charge of committee membership, and Drs. Bill Jemison (Ph.D. '93) and Amarildo Vieira (Ph.D. '97) were responsible for developing the technical program. Dr. Afshin Daryoush, professor, is the editor of the special IMS 2003 issue of *MTT Transactions*. Dr. Linda Mullen (Ph.D. '96) heads the Women in Engineering Program. Numerous others participated in committees, organized workshops, gave presentations and served as volunteers. For the Technical Program Committee meeting, attended by 350 scientists, Drexel loaned laptop computers and provided technical support, with the invaluable help and assistance of Wayne Hill and the ECE Department's computer technicians.

Drexel's contributions saved significant money for the conference, a portion of which will be used to establish the Drexel University Educational Grant in Microwave Photonics through the IEEE Education Fund. President Papadakis announced the establishment of the award at the IMS 2003 Awards Banquet on June 11. At the banquet, Dr. Arthur Paoletta was recognized as a recently elected IEEE fellow, and Dr. Ed Niehenki (Ph.D. '96) received the Distinguished Service award. A special session honoring the technical contributions of Drs. Arye Rosen, Martin Schneider and Kiyomi Tomiyasu was also held at IMS '03.

Fromm Elected International Engineering Consortium Fellow

Dr. Eli Fromm, Roy A. Brothers Professor and director of the Center for Educational Research in the College of Engineering, was elected a fellow of the International Engineering Consortium. The IEC Fellow Award was established in 1994 "to recognize individuals who have provided the information industry with a superior level of sustained and significant service. Areas of service considered include education, technology, and industry leadership contributions." The IEC Fellows make up a highly select group of engineering professionals.

Also in 2003, Dr. Fromm's paper and presentation, entitled "Innovations Which Changed the Engineering Educational Environment," was selected by the director of the UNESCO International Center for Engineering Education as the most outstanding at the center's conference held in Cairns, Australia.

In 2002, Dr. Fromm was the first winner of the National Academy of Engineering's (NAE) most prestigious honor, the Bernard M. Gordon Prize for innovation in engineering and technology education.



Dr. Eli Fromm

ECE Awards and Recognition Ceremony

The annual ECE Awards and Recognition Ceremony was held May 23. Awards were given in recognition of outstanding contributions and achievements by the ECE Department's faculty, staff and students. This event enables the department to show its gratitude to individuals who exemplify dedication to the continued success of ECE.

Award recipients included Dr. Stephen Squires, the Distinguished Alumni Award; Dr. Fernand Cohen, the Thomas Moore Teaching Award; Salil Kanhere, the Allen Rothwarf Outstanding ECE graduate Student Award; and Ryan Scott Castro Spring and Anthony Paul Madonna, Robert Quinn Outstanding ECE Undergraduate Student Awards. Dr. Hun H. Sun and Prof. Martin N. Kaplan received lifetime achievement awards for their service to the department. Dr. Sun joined Drexel's ECE Department in 1953 as an assistant professor of electrical engineering. Prof. Kaplan began his career at Drexel in 1947.



At the ECE Awards and Recognition Ceremony (left to right): Anthony Paul Madonna, Ryan Scott Castro Spring, Prof. Martin Kaplan, Dr. Hun Sun, Dr. Stephen Squires, Dr. Nihat Bilgutay, Dr. Fernand Cohen and Salil Kanhere.

Faculty Activities

The ECE Department welcomes
They bring great expertise to the department

New Faculty



Assistant Professor **Adam Fontecchio** joined the department in fall 2002. He earned his Ph.D. in 2002 from Brown University. His research involves fundamental investigations of liquid crystal interactions to develop novel devices. Using

holographically formed polymer dispersed liquid crystal (H-PDLC) Bragg gratings, he has developed novel multiplexed formation techniques for reflective displays, remote sensing wavelength filtration and a novel strain gauge. He also has investigated the development of polymer/liquid crystal systems for the optimization of electro-optical characteristics.

In 1998, Dr. Fontecchio received a NASA Rhode Island Space Grant Fellowship. From 1999 through 2002, he was a NASA Graduate Student Research Fellow at Goddard Space Flight Center, where he investigated H-PDLC technology for space-borne remote sensing applications. He traveled to Tokyo in the summer of 2000 as part of the National Science Foundation Summer Institute, where he studied polymer-stabilized liquid crystal devices at the NTT CyberSpace Laboratories. He has collaborated with researchers at the Josef Stefan Institute in Ljubljana, Slovenia, through an NSF-funded program. At the 2000 International Liquid Crystal Conference held in Sendai, Japan, he received the Best Poster Award from a field of more than 800 posters.

Dr. Fontecchio has two pending patent applications, "Reflective Strain Gauge and Polarization-Sensitized Devices" and "Holographically-Formed Polymer Dispersed Liquid Crystals with Multiple Gratings."

Assistant Professor **Timothy Kurzweg**

received his Ph.D. from the University of Pittsburgh in the summer of 2002 and joined ECE in September. His research focuses on developing optical propagation techniques suitable for accurate and efficient system-level modeling, and the simulation of multidomain microsystems. He is interested in the design of free-space optical interconnect, switching and communication systems, bio-photonics systems and optical displays based on active optics and MEMS. His work spans the optical, electrical and mechanical domains and their applications for advanced microsystems. His research interests also include optical spectrometry and the optical properties of nanotubes.



...two new faculty members.
...and will work toward our continued success.

In 1999, Dr. Kurzweg worked at Microcosm (now Coventor), in Cambridge, Mass., where he developed an optical methodology to interface within their system-level analysis tool, enabling optical MEM simulation.

The department also welcomed two new staff members this year.

Jonathan Hoult is the UNIX systems administrator. He will manage CBIS and IO, the department's servers, and manage the licensing of servers for the College of Engineering and the ECE Department. He will also provide support for all UNIX workstations. He previously worked at Navpoint Internet Servers as a systems administrator.

Stacey Caiazzo is the Graduate Programs Coordinator. She will also be responsible for maintaining the ECE web page (www.ece.drexel.edu). She is a graduate of Cabrini College where she obtained her bachelor's degree in English/communications.

Research Funding

Dr. Gary Friedman was awarded a \$711,000 Office of Naval Research grant for his project, "Magnetographic Fabrication of Biochemical Microarrays."

Dr. Peter Herczfeld was awarded a \$1 million grant from the Office of Naval Research for his project, "Hybrid Fiber Optic/Wireless System for High-Capacity Military Communications."

Dr. Moshe Kam was awarded a \$495,000 grant from the Office of Naval Research for his project, "Development of a Virtual Distributed Control System-Phase II."

Dr. Harish Sethu was awarded a \$200,000 grant from Northrup Grumman for his project, "Specialized Engineering Services for Advanced Sensor Modeling."

Lifetime Honorees

Martin N. Kaplan



Martin N. Kaplan, Francis Clyde Powell Professor Emeritus, joined Drexel's faculty in 1947 after returning from the U.S. Maritime Service, where he achieved the rank of Commander. Prof. Kaplan graduated from Central High School in Philadelphia in 1937. He received B.S. and M.S. degrees from Drexel in 1943 and 1954, respectively.

During the late 1940s, Prof. Kaplan received a Professional Engineering License and wrote a textbook entitled *Introduction to Altering Current Machinery*, published in 1948. He taught EE classes based on this textbook. Over the years he also served as a key member of the power engineering faculty at Drexel. Throughout his 56 years with the University, Prof. Kaplan spent just two years as a visiting faculty member at other schools, first at Carnegie Mellon in 1961-62. This position allowed him to work on a National Science Foundation-sponsored project focusing on educational research, specifically laboratory-based instruction. His second visiting faculty position was at West Virginia University.

Over the past half-century, Prof. Kaplan has worked as an engineering consultant for numerous legal firms, specializing in electrical disasters. He worked as a consultant for Detroit Edison in the 1970s, developing a course in economic decision making for power engineers. He later rewrote the course and taught it to Drexel power engineering seniors.

In 1989, he was named Francis Clyde Powell Professor. He served the ECE Department as assistant, acting and associate head at various times between 1973 and 1989. He has been an active member of professional organizations including IEEE, the American Society for Engineering Education and Eta Kappa Nu.

Prof. Kaplan received the Lindback Award for Distinguished Teaching from Drexel in 1975. In 1988, he received the inaugural Martin N. Kaplan Distinguished Faculty award, given annually to a faculty member who exhibits exemplary service and dedication to the ECE Department. Although he officially retired in 1989, Prof. remains a valuable member of the faculty and teaches courses on an adjunct basis in the department.

Married to his wife Dorris for 61 years, Prof. Kaplan is the father of two daughters, Judith and Ruth, and has one grandchild.

Dr. Hun H. Sun



Dr. Hun H. Sun earned his Ph.D. from Cornell University in Electrical Engineering in 1955. He had already begun his career at Drexel at that time, working as an assistant professor of electrical engineering from 1953-56. He quickly moved through the academic ranks to become Ernest O. Lange Professor of Electrical Engineering and director of the Biomedical Engineering and Science Institute.

During the next 50 years, Dr. Sun served as an NIH Special Fellow at MIT in 1963-64, director of Drexel's Biomedical Engineering and Science Program from 1964 through 1974 and chairman of the ECE Department from 1973 through 1978.

Throughout his career he has been active in honor societies such as Tau Beta Pi, Eta Kappa Nu, IEEE, AIMBE and Sigma Xi, for which he served as president of the Drexel chapter in 1965. He is the author of more than 110 publications and holds five U.S. patents. His professional activities include serving as editor-in-chief of *Annals of Biomedical Engineering* and *IEEE Transactions on Biomedical Engineering*. He has also worked as a consultant to the Aerospace Research Laboratories at the Wright-Patterson Air Force Base in Dayton, Ohio. He was president of the Philadelphia chapter of EMB, and received the first Research Achievement Award from Drexel's ECE Department in 1973.

Dr. Sun's academic, professional and research activities prove why he is an invaluable member of the Drexel community, and a deserving recipient of this award.

Awards & Honors

ECE Alumni continue to distinguish themselves through their achievements.

Michael Zoltowski B.S.E.E. '83, M.S. '83 was awarded the IEEE Signal Processing Society's Technical Achievement Award for 2003. The award is given "to honor a person who, over a period of years, has made outstanding technical contributions to the theory and/or practice in technical areas within the scope of the Society, as demonstrated by publications, patents, or recognized impact in the field." Zoltowski was chosen for this prestigious award for his outstanding contributions over the past 15 years to the theory and application of array signal processing and space-time signal processing for wireless communications.

Dr. Zoltowski is also a 2003 Distinguished Lecturer for the IEEE Signal Processing Society. The Distinguished Lecturer Program allows well-known educators and authors to lecture at chapter meetings. Dr. Zoltowski also received the Fred Eilersick MILCOM Award for Best Paper at the 1998 IEEE Military Communications Conference, and the 2001 Leonard G. Abraham Prize Paper Award in the Field of Communications Systems at the 2001 IEEE International Conference on Communications. He was elected a fellow of IEEE in 1998, and served on the Board of Governors of the IEEE Signal Processing Society from January 1998 through December 2001.

After graduating with two degrees and highest honors from Drexel in 1983, Dr. Zoltowski received a Ph.D. in systems engineering from the University of Pennsylvania in 1986. From 1982 through 1986, he was an Office of Naval Research Graduate Fellow. In the fall of 1986, he joined the faculty of Purdue University, where he is currently professor of electrical and computer engineering. In August 2001, he was named a University Faculty Scholar by Purdue University. He was the recipient of the IEEE Outstanding Branch Counselor Award for 1989-90, the Ruth and Joel Spira Outstanding Teacher Award for 1990-91 and the 2002 Wilfred Hesselberth Award for Teaching Excellence.

Alumni Profiles

Fred Palmer B.S.E.E. '63, M.S. '68 is chairman of the ECE Advisory Council. Before his retirement in 2000, he served from 1990 as director of the Engineering Process Improvement Center for Lockheed Martin. He was responsible for the development and implementation of the Engineering Process Improvement Program throughout the corporation. Previously, Mr. Palmer was general manager of the Strategic Systems Department at Lockheed Martin, directing the system engineering and integration program for the Strategic Defense Initiative.

Before coming to Lockheed Martin, Mr. Palmer served on the technical staff of the Applied Physics Laboratory at Johns Hopkins University. Prior to that, he was the program general manager for submarine combat systems and vice president of engineering at Government Electronics Systems in Moorestown, N.J. He joined Government Electronics Systems in 1965 as an engineer, where his engineering and program management assignments included responsibility for developing products for aerospace and defense applications.

Mr. Palmer is a managing partner, along with his son Andrew, in Palmer Developers, a property development company with operations in southern New Jersey. He serves on the Board of Directors for the Software Productivity Consortium, and was chairman of the board from 1998 through 2000. He has published several technical papers on signal processing and computer systems and was granted a U.S. patent for wide dynamic range signal processing.

Student News

Xiaobo Hou, a doctoral candidate, received second place in the Best Student Paper competition at this year's Sarnoff Symposium. His paper, "Challenges of a GS/s All-optical Analog-to-Digital Converter," was written with his doctoral advisors, Drs. Afshin Daryoush and Warren Rosen, and Ralph Lachenmaier (NAWC, China Lake). Xiaobo's success continues ECE's record of receiving considerable recognition at the Sarnoff Symposium. •

Adam O'Donnell and **Eric Gallo** received the 2002 National Science Foundation Graduate Research Fellowships. O'Donnell and Gallo are doctoral students, advised respectively by Dr. Harish Sethu and Dr. Bahram Nabet. Doctoral student **Benjamin Yellen** also received an honorable mention at this year's NSF graduate Fellowship program. Yellen is an ECE Ph.D. student being advised by Dr. Gary Friedman. O'Donnell and Gallo received the 2002-2003 National Defense Science and Engineering Graduate Fellowship. O'Donnell also is the author of *Hacker's Challenge 2*, a collection of real-world security breaches and solutions presented as a series of challenges for network security professionals.

The first edition of *Hacker's Challenge*, to which O'Donnell was a contributor, sold more than 70,000 copies. •

Three of the Teaching Assistant Excellence Award winners for 2002 were ECE graduate students, recognized for their hard work and commitment at a ceremony and reception last May. **Vishruta Dumane** completed her Ph.D. under the supervision of Dr. P. Mohana Shankar. She is a researcher at Memorial Sloan Kettering Cancer Center. **Jayesh Iyer** and **Kavitha Sriraman** were recognized for their contributions to tDEC. •

The Executive Committee of the IEEE Philadelphia Section approved a \$5,000 IEEE Student-Branch Leadership Scholarship for pre-junior **Richard Primerano** for 2002-03. Richard is an active student leader of our IEEE Student Chapter and an Anthony J. Drexel Scholarship recipient. •

Joseph Michel, a student in the ECE evening program, was awarded the American Society of Naval Engineers 2002-03 scholarship. The ASNE scholarship was established to encourage college students to enter the field of naval engineering. •

Sowmiya Jayachandran is a senior computer engineering major with a focus in networking and operating systems. She held co-op positions as a software tester and programmer. "Co-op was an experience that allowed me to decide what direction I wanted to take my career in," she said. Jayachandran also did a co-op at Unisys, working with hardware engineers to help design their mainframe processor. Unisys sponsored her senior design project, "Migration of ASIC design into FPGA(s)." •

Yong Lee, a senior ECE student, is considering graduate studies at Drexel because of his "close interaction with faculty and positive experience at Drexel, with the ECE Department, and with co-ops." Lee held co-op positions at Five Serve Securities in West Chester, in the networking department; at Inrange, working closely with engineers to debug the company's latest products and at WMI in West Chester, as a software/hardware engineer. Yong recognized that his classes and co-ops worked hand-in-hand, and says he has a strong appreciation for the curriculum and how it helped him in the workplace. •

Michelle Sipics, a senior computer engineering major, found the department to be an impressive group of experts. She noted that professors were helpful in every aspect of her education, and she has decided to continue her studies as a graduate student at Drexel. She especially found Dr. Trachtenberg's classes on cryptography, computer arithmetic and secure computing to be impressive. Sipics said, "I haven't found any other school to have classes centering on cryptography, and I find that to be a main advantage of the department." •

Talk Back!



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Please send us information about your professional and civic activities to include in future issues of this newsletter.

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- I am willing to talk to freshmen.
- I am willing to mentor students.
- I am willing to participate in open houses.

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