

*Electrical and Computer Engineering
Department*

2003-2004 Annual Report



September 1, 2003 - August 31, 2004



Electrical and Computer Engineering Department

Memorandum

To: Constantine Papadakis, President
Ali Houshmand, Interim Provost
Bill Stephenson, Vice Provost for Research and Dean of Graduate Policy
Barbara Spiro, Senior Vice President for Institutional Advancement
Jacques Catudal, Vice Provost for Academic Affairs
Selçuk Güçeri, Dean of Engineering

From: Nihat Bilgütay, Department Head

Date: January 31, 2005

Re: ECE Department Annual Report 2003-2004

Enclosed please find the Annual Report of the Electrical and Computer Engineering Department for the Academic Year 2003-2004. I am pleased to share with you a summary of the notable achievements and key events and activities of our faculty, students and alumni that continue to make the ECE Department a successful and enriching part of the University Community.

Cc: ECE Faculty
ECE Advisory Council
Ken Blank
Mun Choi
Tony Lowman
Lydia Kokolskyj

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ECE DEPARTMENT ANNUAL REPORT

September 1, 2003- August 31, 2004

FACULTY AWARDS AND HONORS

Dr. Eli Fromm, *LeRoy A. Brothers Professor of Electrical and Computer Engineering and Director of the Center for Educational Research in the College of Engineering*, was elected along with 75 fellow engineers to join the prestigious National Academy of Engineering (NAE) on February 13, 2004. Election to the Academy is among the highest recognitions accorded to an engineer. It honors those "who have made important contributions to engineering theory and practice" and those who have "demonstrated pioneering achievements in new fields of engineering." The NAE chose Dr. Fromm for his "innovation and leadership in the development of a holistic curriculum for engineering education." In 1988, Dr. Fromm was instrumental in introducing the Enhanced Education Experience for Engineers (E4) program, which later developed into Drexel's groundbreaking Drexel Engineering Curriculum (tDEC)—which has become a model of engineering education worldwide. This recognition by the NAE is a tremendous tribute to Dr. Fromm's dedication, research and work to advance engineering education.

Dr. Fromm has received many other outstanding awards during his career, including the NAE's inaugural Bernard M. Gordon Prize for innovation in engineering and technology education in 2002. This year was no exception. Not only was he elected to the National Academy of Engineering, he was also recognized by the International Engineering Consortium when it presented him with the IEC Fellow Award for 2004. This award was established in 1994 to recognize individuals who provided the information industry with a superior level of sustained and significant service. In receiving the IEC Fellow Award, Dr. Fromm joined more than 80 communications and technology trailblazers, including Gordon Moore, former CEO of Intel; David Packard, founder of Hewlett-Packard; Robert Galvin, former Motorola CEO; Vinton Cerf, senior vice president of MCI; Jack S. Kilby, Nobel Laureate and a pioneer in the development of the integrated circuit; and John Chambers, President and CEO of Cisco Systems. It is clear from this list of previous recipients that as a fellow of the IEC Dr. Fromm joins a highly distinguished group of very top individuals in engineering and science. Such outstanding recognitions enhance Drexel's national and international visibility and certainly contribute to improving our national rankings.

Dr. Fromm also received the 2004 Distinguished Alumni Award of the Thomas Jefferson University College of Graduate Studies at their Alumni Day celebrations held April 30, 2004 at Thomas Jefferson University. As part of the program, Dr. Fromm gave the Distinguished Alumni Lecture entitled "Diversification," which was followed by a reception and the awards dinner. His numerous honors are a much-deserved acknowledgment of his incredible contribution to the ECE Department and to the field of engineering as a whole.

Dr. Karen Miu, *Associate Professor of Electrical and Computer Engineering*, received an Honorable Mention Award from the Eta Kappa Nu's 2003 Outstanding Young Electrical Engineer Award Program. This honor was bestowed upon her at the National Eta Kappa Nu Annual Awards Banquet on May 3, 2004. The awards ceremony was held at the New Brunswick Hyatt Regency Hotel in New Jersey and Drexel was represented by ten faculty members and guests and four students. Eta Kappa Nu honored Dr. Miu in recognition of her "notable contributions in electric power distribution systems and for her involvement in student and professional activities." This is a wonderful achievement for Dr. Miu as this award recognizes some of the most outstanding young electrical engineers in the nation.

Dr. Nihat Bilgutay, *Department Head of ECE and Vernon L. Newhouse Professor of Electrical and Computer Engineering*, was honored at a ceremony held on May 7, 2004 as one of Drexel's newly appointed named professors. Dr. Bilgutay was appointed as the Vernon L. Newhouse Professor of Electrical and Computer Engineering. The honor of holding a named professorship indicates that the individual has made sustained outstanding contributions to his or her chosen field and to Drexel University. Drexel University officially conferred new named professorships at the Convocation ceremony that was held in October 2004.

Dr. Bilgutay was elected to join the ranks of the IEEE Fellows in 2004 "for leadership in engineering education innovation." The IEEE Grade of Fellow is conferred by the Board of Directors upon a person "with an extraordinary record of accomplishments in one of the IEEE fields of interest." Election to IEEE Fellow is one of most prestigious honors the Institute can bestow upon its members- it is the highest grade of membership in the IEEE. The election process is extremely rigorous and less than one in a thousand IEEE members is recognized with this honor each year. Dr. Bilgutay was one of the two new Fellows from the Philadelphia Section and was honored at the 2004 IEEE Philadelphia Section Awards & Recognitions Banquet held on Saturday, April 3, 2004 at the Union League of Philadelphia.

The Cooperative Education program also showed its appreciation to Dr. Bilgutay by honoring him with the 2004 Outstanding Co-Operative Education Faculty Award at their Awards Ceremony on May 6, 2004. Dr. Bilgutay was also honored for receiving this award at the Faculty Recognition Dinner held on Thursday, June 3, 2004 in Behrakis Grand Hall.

Dr. Moshe Kam, *Robert G. Quinn Professor of Electrical and Computer Engineering*, was recognized at the 2004 IEEE Philadelphia Section Awards & Recognition banquet held on Saturday, April 3, 2004. He accepted the IEEE Chapter of the Year award for his "exceptional leadership in developing Chapter activities and encouraging their growth in the Philadelphia Section," as chair of the IEEE Philadelphia Chapter of the Communications and Information Societies. This award is a testament to the amount of energy he has poured into enriching the Philadelphia Section while concurrently excelling in his other duties and responsibilities.

Dr. Bruce Eisenstein, *Associate Dean of the College of Engineering, Arthur J. Rowland Professor of Electrical and Computer Engineering*, was selected by the IEEE Educational Activities Board (EAB) to serve as a program evaluator for ABET accreditation of Electrical Engineering programs. He will serve a five-year term in this capacity. This is an important assignment and he will undoubtedly serve IEEE well in this role. On June 30, 2004 Dr. Eisenstein finished his term as the East Region Director on the National Eta Kappa Nu Board of Directors which he had held since July 1, 2002.

Dr. Athina Petropulu, *Professor of Electrical and Computer Engineering*, was elected to serve on the Signal Processing Society Board of Governors in the capacity of Member-at-Large for the term January 1, 2004 through December 31, 2006. This is a notable and highly visible position in one of the major IEEE societies.

Dr. Adam Fontecchio, *Assistant Professor of Electrical and Computer Engineering*, received the International Liquid Crystal Society Multi Media prize at the International Liquid Crystal Symposium held in Slovenia in July 2004. This prize is awarded to encourage the use and development of multimedia technologies facilitating global communication of liquid crystal sciences and technologies. The prize included an invitation to give a talk on the subject of internet dissemination of scientific results.

Dr. Kevin Scoles, *Associate Professor, Undergraduate Advisor and Assistant Department Head for Undergraduate Affairs*, along with Drs. Reddy, Gordon and Feuerman and students Mr. Sun and Mr. Israeli won the Best Paper Award in the Photovoltaic Category in the Solar 2004 Conference of the American Society of Mechanical Engineers held in Portland, Oregon from July 11-14th, 2004. Their paper was entitled, "Modeling and Experimental Evaluation of Passive Heat Sinks for Miniature High-Flux Photovoltaic Concentrators."

The College of Engineering Honors Day was held on February 25, 2004 in the Main Auditorium. This is an annual ceremony to honor the accomplishments of the faculty, staff and students of the College of Engineering, and to celebrate their vast contributions and excellence. Several members of the ECE Department were acknowledged for their contributions to the College.

The following awards were given to ECE faculty and staff members:

Dr. Eli Fromm, Lifetime Achievement Award

Dr. Moshe Kam, Robert Quinn Medal for Outstanding Leadership

Dr. Chika Nwankpa, Research Accomplishment Award

Mrs. Kathy Bryant, Support Staff Achievement Award

Mr. Brian Kravitz, Technical Staff Achievement Award

****A complete list of CoE Honors Day 2004 award recipients is attached in Appendix A*

During **Research Day 2004**, held on May 4, 2004, a number of ECE faculty members were initiated into the 10-to-the-6th Club. Membership to 10⁶ Club is awarded to faculty members whose total research grants as PI or Co-PI have reached or exceeded \$1M during the previous fiscal year. Securing research grants of such significant amounts is a notable achievement and contributes to significantly improving the visibility and research environment of the University and the ECE Department. The 10⁶ Club awardees for 2004 were:

Dr. Moshe Kam
Dr. Karen Miu
Dr. Prawat Nagvajara
Dr. Dagmar Niebur
Dr. Chika Nwankpa
Dr. Harish Sethu

The University also announced its Synergy Grants on Research Day. Two ECE faculty members, **Dr. Gary Friedman** and **Dr. Adam Fontecchio** received a Synergy grant for their project entitled, "Maximizing Transgenic Yield using Microfabrication Array and Force Feedback for Cell Manipulation." They are both Co-PIs on this grant for which Dr. Jaydev Desai (MEM) is the PI.

In 2003, a number of ECE faculty members reached milestone years of service at the University. The **2003 Employee Service Awards** were presented to the Drexel faculty and staff at a ceremony held on December 4, 2003 at the George Behrakis Grand Hall. The Employee Service Awards in ECE went to the following faculty members in recognition of their dedicated contributions and service on behalf of the ECE Department:

Ed Gerber	45 years
Eli Fromm	35 years
Peter Herczfeld	35 years
Oleh Tretiak	30 years
Stan Kesler	20 years
Peter Lewin	20 years
Kambiz Pourrezaei	20 years
Kevin Scoles	20 years
Mohana Shankar	20 years
Lazar Trachtenberg	20 years
Fernand Cohen	15 years
Athina Petropulu	10 years
Constantine Katsinis	5 years
Karen Miu	5 years
Harish Sethu	5 years

Dr. Timothy P. Kurzweg was awarded a SPIE Educational Grant in Optical Science and Engineering in the amount of \$1,250. SPIE is the International Society for Optical Engineering. The project will involve the creation of an optical "black box" composed

from VCSELS, photodetectors, and reconfigurable FPGAs for the drive and receiver circuitry. This system will be used in a number of the growing optical courses being developed in our Department.

STUDENT AWARDS AND HONORS

An article entitled *Stent and Deliver*, featuring the magnetic drug delivery system developed by Drexel's engineering team was published in the August 2004 issue of the MIT Technology Review. This article highlighted the joint work led by **Dr. Gary Friedman** of ECE Department (with graduate students **Ben Yellen, Derek Halverson, Gregory Fridman**) and **Dr. Ken Barbee** of Biomed (with graduate student **Zack Forbes**). MIT Technology Review is the premier emerging technology publication, which is indicative of the high quality of work being conducted at Drexel. This magnetic drug delivery platform will constitute the core technology of Magnetic BioSystems, a company recently formed by Ben and Zach.

The following ECE students received **top honors** in the June 2004 graduation for achieving the highest GPAs in their major:

1st Honors CE	Michal Cohen, 3.96
1st Honors EE	Iman Lordgooei, 3.96
2nd Honors CE	Lance Feters, 3.87
2nd Honors EE	Timothy Furman, 3.89

The ECE Senior Design presentations were held during the week of May 17, 2004. The ECE Senior Design Committee met on May 26, 2004 to review the faculty and advisor senior design project presentation evaluations and to select the ECE Senior Design Award winning teams. The prizes awarded by the ECE Department include \$500 for each team and certificates for each team member and their advisors. A total of six prizes were awarded this year. Three of the prizes were funded by Unisys, and were awarded to computer-intensive projects. The remaining three prizes were funded by the ECE Department. The ECE senior design awards and certificates were presented at a ceremony held on Thursday, June 3, 2004.

*** ECE Senior Design Award winners ***

Unisys Prize Winners

ECE-04 Instrumentation for Measuring Reaction Time in Close Quarter Combat Training

E. Fayn, M. Garfield, R. Langer, M. Webster

Advisor: Dr. Dandekar

ECE-25 Enhanced Data Logger

T. Furman, C. John, E. Martinez, Z. Tun

Advisor: Dr. Scoles

ECE-32 Instrumented Bike Pedals for FES

M. Ginder, J. Greising, M. Kleinberg, D. Lind, M. Bhowmik

Advisor: Dr. Guez

ECE Prize Winners

ECE-19 Cost Effective Distributed Generation Placement in a Microgrid

J. Holstein, K. Neidlinger

Advisor: Dr. Miu

ECE-27 Integrating Passive Solar Energy in Climate Control

S. Crowell, N. Imfeld, K. James, J. Lane

Advisors: Dr. Niebur, Dr. Wen (CAEE)

ECE-29 An Autonomous Underwater Vehicle

R. Limon, M. Mathews, K. Sevcik, K. Terrado

Advisors: Dr. Kam, Dr. Hrebien

Choosing the team to go to the college competition from these ECE top teams was especially difficult, since all the award winning teams did an excellent job. The Committee finally decided to give this opportunity to team ECE-32, the Instrumented Bike Pedals for FES project.

The College of Engineering Senior Design Competition was held on Wednesday, June 2, 2004, where the top eight senior design teams in the College of Engineering presented their work to a panel of seven industry judges. The presentations were very professionally done, and covered a broad range of engineering areas. Two teams with ECE students participated: ECE-32 Instrumented Bike Pedals for use in Functional Electrical Stimulation with members **M. Bhowmik** (Biomed), **M. Ginder, J. Greising, M. Kleinberg, D. Lind** (ECE), and advised by Dr. Guez (ECE) and Dr. Lee (Shriner's Hospital), and MEM-23 Micro-Hovering Air Vehicle with ECE members **Long Huynh** and **Teng Myauo**, and advised by Dr. Oh (MEM).

The ECE-32 team won the third prize in the competition and the team members received a \$500 award. A total of \$4,700 in awards was distributed to the COE Senior Design Competition prize winners.

COE Prize Winners

First Prize (\$2,000)

MAT-1 Super-Capacitance Measurements of Porous Carbon Obtained Through Chlorination of Metal Carbide

Second Prize (\$1,000)

BIOMED-3 Improving Attachment of Polymeric Contrast Agent to Cells for Use in Ultrasound Imaging

Third Prize (\$500)

ECE-32 Instrumented Bike Pedals for Use in Functional Electrical Stimulation

Honorable Mention (\$300)

CAEE-7 Coatesville Train Station Complex Improvements

ChemE-1 The Production of Recombinant Interferon - β Proteins for Injection

CS-1 Mobile Mathematics Communication

MEM-16 Upgrade of Existing SSBN Submarine Staging to Conform to the New SSGN Platform

MEM-23 Micro-Hovering Air Vehicle

*** The College of Engineering Honors Day Student Award Recipients ***

Mike Ermold, Dr. Adam Fontecchio's graduate student, secured a second year renewal of his NASA Graduate Student Researchers Program (GSRP) fellowship through the Marshall Flight Space Center. Mike also received a SPIE Educational Scholarship in Optical Science and Engineering from the International Society of Optical Engineering. The award was \$1,500 for conference attendance and presentation.

Alia Sabur, the nation's youngest PhD student who is in her first year as ECE student received the prestigious National Defense Science and Engineering Graduate Fellowship and will study under Dr. Selcuk Guceri. Her proposal was funded by the Air Force Office of Scientific Research. The total funding for the fellowship can exceed \$150,000 per student and is for annual stipends, tuition and health care for three years. This year only 116 Fellows were selected from an applicant pool of over 1,500 students pursuing their PhDs. Alia was also recognized with an Honorable Mention for the National Science Foundation Graduate Fellowship in 2004.

Sarod Yattawatta, Dr. Athina Petropulu's graduate student, became a Hill Fellow. The award for the fellowship was \$5,000. The George Hill, Jr. Endowed Fellowship, established in 1991, is awarded to qualified Ph.D. candidates in the College of Engineering. Recipients have proven excellence in their undergraduate and graduate

careers and are able to demonstrate their potential to achieve academic excellence at the Ph.D. level. Preference is given to students pursuing a career in academia.

Derek Halverson, Dr. Gary Friedman's graduate student, was recognized with an Honorable Mention for the National Science Foundation Graduate Fellowship in 2004. NSF Graduate Fellowships offer recognition and three years of support for advanced study to approximately 900 outstanding graduate students in the mathematical, physical, biological, engineering, and behavioral and social sciences, including the history of science and the philosophy of science, and to research-based Ph.D. degrees in science education. It is quite an achievement to obtain an honorable mention for this fellowship.

****A complete list of CoE Honors Day 2004 award recipients is attached in Appendix A*

Dr. Tim Kurzweg's student **Shubham Bhat** garnered 2nd Prize in the Student Poster competition associated with the 2004 IEEE Sarnoff Symposium on Advances in Wired and Wireless Communications. His poster displayed information from a joint project with Dr. Allon Guez to advance optical communication through the use of model-based automation for alignment and packaging.

The USGA held the **Student Life Awards Banquet** entitled, "Lead the Night Away" on May 13, 2004. Each year the Division of Student Life and the Undergraduate Student Government Association recognize the outstanding contributions of student leaders, student organizations, and their advisors to the Drexel community. The awards below include a \$500 scholarship credited to the student's University account. The Division of Student Life and the Undergraduate Student Government Association recognized the following students from the well-represented ECE Department:

Trishna Shah - Dean J. Peterson Ryder, Senior Awards

Jason Gomes - Alexander Van Rensselaer Awards

Jason Rafoth - Alexander Van Rensselaer Awards

Regina Cagle- Marilyn A. Burshtin Award

ECE Senior **Trishna Shah** was named 2004 Homecoming Queen after raising more than \$1,000 for the Philadelphia Cares Foundation. Sophomore **Daniel Steinberg** was named 2004 Homecoming King after raising more than \$300 for the World Trade Center Memorial Foundation. The two were nominated by the Undergraduate Student Government Association and crowned at the Crystal Ball on Saturday, January 31, 2004.

Nevzat Cubukcu, a member of the Men's Tennis Team, was the upperclassman with the highest grade point average and thus received the Team Scholar-Athlete Award. He was also listed on the Scholar-Athlete Roster for having achieved a GPA of 3.6 or higher.

The **Co-Operative Education Awards Ceremony** was held on May 6, 2004. At this ceremony the Co-operative Education Office presented **Matthew Ecker**, an ECE senior, with the Outstanding Co-Operative Education Senior Award. Matthew was nominated by Lockheed-Martin for his outstanding accomplishments and contributions during his Co-Op assignment with the company.

Joseph Dorn became a member of the Co-operative Education Honors Society. Members of the Honors Society all have a minimum grade point average of 3.5, and all have received above average Co-op evaluations from their employers.

Research Day 2004 was held on May 4, 2004 in the Daskalakis Athletic Center. An undergraduate team of ECE students composed of **Hiywote Demisse, Jong Hyung, Thomas Antrobus, Emem Ekong, Rob Higgenbotham** and **Xiaobo Hou** (advised by Dr. Afshin Daryoush) won the well-respected CoE Dean's Award. Their poster was entitled "384M Optical Data Network Transponder up to 10 GB/S."

In the annual Martin Luther King Jr. Writing Competition eight submissions were elected as winners. **Jon Guez**, Dr. Allon Guez's son, was one member of this select group. All of the pieces honored the life of the late civil rights leader.

Every year the Teaching Assistants make a large contribution to the ECE Department. This was a banner year for the ECE TAs, who were recognized by Drexel for their outstanding contributions and dedication. The recipients of Drexel University TA Excellence Awards from ECE Department were:

Chris Gaughan
Andrzej Gorski
Zayd Hammoudeh
Anant Kini
Adam O'Donnell
Michelle Sipics
Sindhu Venkatachary

ALUMNI AWARDS AND HONORS

The 2004 IEEE Philadelphia Section Awards & Recognitions Banquet was held on April 3, 2004 at the Union League of Philadelphia. Alumni award recipients with ECE connections included **Dr. Li Bai** and **Mr. James I. Burris, Jr.**, who were both recognized as "Delaware Valley Young Engineer of the Year for 2004." Dr. Bai received his MSEE in 1997 and Ph.D. in 1999 at Drexel under the supervision of Dr. Moshe Kam, and is presently an Assistant Professor in the Electrical and Computer Engineering Department at Temple University. Mr. Burris received his BSEE in 1993 from Drexel and is presently employed by PECO Energy as Manager of Engineering Design.

Kenneth Dahlberg ('67) was named the chief executive officer and president of Science Applications International Corporation (SAIC) in November of 2003 and chairman of the board in July of 2004. Prior to joining SAIC, Dahlberg served as executive vice president of General Dynamics where he was responsible for the company's Information Systems and Technology Group. Before this he had been Executive Vice President for business development of Raytheon and president of Raytheon International Inc., a subsidiary. At Raytheon, he had oversight for international and domestic business development and government relations. In the time preceding the 1997 merger of Raytheon and Hughes Aircraft Company, Ken served as a corporate vice president of Hughes Electronics Corp., and as a senior vice president of Hughes Aircraft Company.

Dr. Stephen Squires ('70) was named the Drexel University College of Engineering 2003 Engineer of the Year at a dinner ceremony in Behrakis Grand Hall on October 16, 2003. Dr. Squires is currently the Vice President and Chief Science Officer for the Hewlett Packard Company. In his present capacity, Squires is helping Hewlett-Packard achieve sustainable strategic advantage from the frontier of future galactic-scale information systems down to the introduction of atomic-scale technologies. Prior to his work with Hewlett-Packard, Squires was the special assistant for Information Technology to the director of the Defense Advanced Research Projects Agency (DARPA).

At the same dinner ceremony, the College of Engineering inducted **Dr. Stephen Squires ('70)** and **Kenneth Dahlberg ('67)** into the Circle of Distinction. The Circle of Distinction consists of Drexel Alumni who were unanimously picked by the College's Advisory Board for their outstanding achievements.

Jayesh Iyer ('02) was honored by Intel India with the Spontaneous Recognition Award for his contribution towards the design and boot of the first Board (code named Lithia Park) that his team created. This is one of the four awards that Intel India has for its employees.

ECE DEPARTMENT AWARDS AND RECOGNITION DINNER CEREMONY

The Annual ECE Awards and Recognition Dinner Ceremony was held on Monday, May 17, 2004, at the Behrakis Grand Hall. There were 42 people in attendance. The following awards were presented:

*** The Robert Quinn Outstanding Undergraduate Student Awards ***

Hiywote Demisse was born in Ethiopia on December 30, 1981. She attended Nativity Catholic Cathedral School for her middle and high school education, where she graduated with very high distinction among her classmates. Currently, Hiywote is an

Electrical and Computer Engineering with concentrations in Advanced Electronics and Operating Systems. Her main interests are in the areas of Analog and Digital design.

Hiyote has been the recipient of numerous awards and scholarships throughout her academic career including the Dean's scholarship, the L.P. Mains scholarship (2000) and the Certificate of Merit for Exceptional Academic Achievements (1999).

Currently, she is working on her senior year project. The project is a MMIC design of a digital receiver for a 4x4 phased array antenna. She has also won the dean's award in the sixth annual research day competition sponsored by the office of research and graduate studies for her design project on a 10Gbps transponder.

Iman Lordgooei is a senior electrical engineering major. After graduating from Urbana High School in Urbana, Illinois, Iman began his undergraduate studies at Drexel University. While at Drexel, Iman has received several awards including the A. J. Drexel Award, the Alvin W. Wene Award and the Milton Rosenberg Scholarship. He is also a member of several elite honor societies including Eta Kappa Nu, Tau Beta Pi, the National Society of Collegiate Scholars and the National Dean's List.

As a freshman, Iman entered his design project in the Baiada Center Business Plan Competition, where he placed as a top 6 finalist. After spending his co-op at the intellectual property law firm RatnerPrestia, Iman's interest in engineering from a legal perspective led him to begin applying to law schools. He has been accepted to several top institutions.

*** The Allen Rothwarf Outstanding Graduate Student Awards ***

Xiaobo Hou received B.S. and M.S. degrees in electrical engineering from Tsinghua University (Beijing, China) in 1997 and 2000, respectively. She is currently pursuing a Ph.D. in electrical engineering under the guidance of Drs. Warren Rosen and Afshin Daryoush, and expects to graduate in June 2004.

Xiaobo's research activities include high-speed photonic components, 10 Gbps digital IC design and layout and 2.5GHz mixed signal IC design and layout. Her Ph.D. dissertation is to design a high-speed all-optical analog-to-digital converter, which will bring many novel ideas to optical ADCs.

Xiaobo received second place in the IEEE Sarnoff Symposium 2003 in the student paper contest and received the dean's award at the College of Engineering's Research Day competition 2004.

Yiming Mao received B.S. and M.S. degrees in electrical engineering from Southeast University, China. His masters thesis is on the design of a DMS (Distribution Management System), which will be used to improve distribution system reliability. He is currently working toward his Ph.D. degree at Drexel University in the Department of Electrical and Computer Engineering.

His research interests include power distribution system analysis and distribution protection systems. He plans to continue his career in power system research and its related areas after his graduation.

*** The Staff Service Recognition Awards ***

Tanita Chappelle began her career at Drexel University in 1990 as the ECE Department's Secretary. Over the past fourteen years, she has advanced to the position of Office Services Coordinator. As the Office Coordinator, Tanita is responsible for assisting the students and faculty with all undergraduate affairs.

Scott Currie began his career with Drexel University in 1987 as a Laboratory Technician for the ECE Department. Over the past seventeen years, Scott has advanced to the position of Power Laboratory Service Coordinator. In this position, he is responsible for all of the technical operations and laboratory renovations in the Power Lab. Scott continues to update and improve the Power Lab facilities, while providing technical assistance to the research projects in the Department. His commitment was a key factor in establishing the new Distribution Laboratory, where he laid out, fabricated and installed all components of the new lab.

Before joining Drexel, Scott received a Certification in Micro-Processing and Communication while working on his Associates Degree in Maryland. After his graduation, he worked for Litton Amaxon as a U.S. Defense Contractor on various projects including radar systems for Navy Aircraft and Shipboard Damage Control Systems.

Scott has been married to his wife Eileen, who works for Drexel's College of Engineering, for thirty-five years. They have two children and one grandchild.

*** The ECE Outstanding Research Award ***

Dr. Karen Miu received a B.S.E.E., M.S.E.E. and Ph.D. from Cornell University. In 1998, she joined Drexel University and is currently an Assistant Professor. Her research interests include the modeling and analysis, application development and performance evaluation of electric power systems with a particular focus in power distribution systems (<115kV). She has published over 30 refereed conference and journal publications and has served as a principal investigator or Co-PI on research grants from agencies such as NSF, ONR and DOE, as well as industry. Dr. Miu received a NSF Career Award (2000), an ONR Young Investigator Award (2001) and a Mary and Christian Lindback Minority Junior Faculty Award (2003). Through this support, she has led the development of several software and hardware tools for distribution automation and control functions such as electric load estimation and service restoration techniques. She has been an active participant in IEEE and ASEE technical societies and has held leadership positions in subcommittees/committees for the IEEE Power Engineering Society and Circuit and Systems Society.

*** The Distinguished Alumnus/Alumnae Award ***

John McCool, the recipient of the ECE Distinguished Alumni Award in 2004, is Vice President of Cisco Systems. He heads the company's Gigabit Switching Business Unit (GSBU). McCool is responsible for product management and development of the Catalyst 4500 Series switches. This series is one of three major switching product lines at Cisco. It targets enterprise wiring closet, network distribution and metro Ethernet applications.

McCool joined Cisco in 1996 with the acquisition of Granite Systems, a start-up that focused on developing equipment for the nascent Gigabit Ethernet market. Prior to Granite, he headed development of the industry's first dual-speed 10/100Mbit Ethernet switch at SynOptics. McCool held management and design positions at NeXT Computer and Advanced Micro Devices that focused on the development of communication ICs. He has been active in the IEEE and ANSI standards development for the Fiber Distributed Data Interface (FDDI), 10BASE-T and 100BASE-T protocols. He holds several patents related to his work on networking technologies.

McCool graduated from Drexel University in 1982 with a BS degree in Electrical Engineering and received a MS degree in Computer Engineering from Santa Clara University. He currently lives in Northern California with his wife and two children.

**ECE RESEARCH AWARDS AND EXPENDITURES
IN FY 2003-2004**

The ECE Department achieved the largest totals in research awards and expenditures in the University for FY 2003-04. The total ECE Grant/Contract Awards including the multi-unit awards for FY 2003-04 (1 July 2003 to 30 June 2004) totaled \$17,310,427 (note: this corresponds to \$16,579,338 in grants with ECE faculty serving as PI and \$731,089 in joint grant totals where ECE faculty members are Co-PIs with PIs from units outside the ECE Department). The ECE total corresponds to 61.6% of the COE and 15.5% of the University totals for the same period. Note that since FY'02-03, the total DU awards and expenditures also includes the former Hahnemann University colleges/schools. A list of the individual ECE research grant awards for FY 2003-04 is attached to the report (Appendix B).

<u>FY</u>	<u>Total ECE Awards</u>	<u>% of COE Awards</u>	<u>% of DU Awards</u>
97-98	\$2,247,896	33.7%	12.1%
98-99	\$3,010,375	31.5%	14.3%
99-00	\$9,040,071	61.5%	28.1%
00-01	\$10,951,621	49.5%	21.2%
01-02	\$15,048,450	50.9%	31.6%
02-03	\$12,194,223	42.1%	12.1%
03-04	\$17,310,427	61.6%	15.5%

The combined ECE Grant Expenditures for FY 2003-04 (1 July 2003 to 30 June 2004) totaled \$14,449,659 (note: this corresponds to \$13,523,163 in grant expenditures where ECE faculty are listed as PI and \$926,496 for Gateway grant expenditures (although Dr. Fromm is the PI, the project expenses were listed separately outside ECE)). The ECE total corresponds to 58.5% of the COE and 15.9% of the University total expenditures for the same period.

<u>FY</u>	<u>Total ECE Exp</u>	<u>% of COE Exp.</u>	<u>% of DU Exp.</u>
97-98	\$2,406,672	37.1%	15.7%
98-99	\$2,665,461	39.7%	15.0%
99-00	\$2,860,793	30.2%	15.7%
00-01	\$8,351,565	61.6%	29.5%
01-02	\$11,497,668	57.9%	24.2%
02-03	\$13,449,656	53.0%	15.9%
03-04	\$14,449,659	58.5%	15.9%

The following tables provide a summary and comparison of research activity across the University by college and department (within COE and across the University).

Drexel University FY'04 Research Activity Summary by College

College	Proposals	Awards	Expenditures
Medicine	178,095,646	47,271,751	42,193,042
Engineering	137,481,701	27,364,252	24,713,251
Arts & Sciences	40,117,195	11,234,442	7,072,632
Biomed	29,702,280	7,744,597	5,159,100
COMAD	1,663,000	4,636,000	3,533,135
Provost	2,131,264	4,436,128	2,095,440
CIST	13,499,257	3,715,979	407,110
Public Health	3,351,890	1,712,549	716,791
Nursing & HP	9,654,243	1,261,923	1,505,681
President	695,529	695,529	500,000
Education	7,704,950	635,000	1,038,749
VP for Research	2,192,310	428,214	623,632
COEPS	2,768,380	286,263	796,172
Business	3,246,340	119,122	457,658
VP Student Life	20,122	20,122	289,626
Totals	432,324,107	111,561,871	91,102,019

Largest Research Activity by Department at Drexel University

Department	Proposals	Awards	Expenditures
ECE	43,443,052	16,579,338	13,523,163
Biomed	29,702,280	7,744,597	5,159,100
Neurobiology & Anat.	33,486,679	6,099,550	6,541,154
Microbiology & Immun.	40,587,370	6,078,183	6,877,913
Biochemistry	21,971,774	5,588,644	4,620,481
OBGYN	23,037,627	5,140,908	2,622,020
Pediatrics	9,418,323	5,017,729	4,421,761
Psychiatry	8,126,771	4,741,290	5,178,198
Medicine	4,871,146	4,346,992	5,101,370
Pharmac. & Phys.	15,869,356	4,330,031	3,578,587
Totals	230,514,378	65,667,262	57,623,747

Departmental Research Activity in the College of Engineering

Department	Proposals	Awards	Expenditures
ECE	43,443,052	16,579,338	13,523,163
Materials Eng.	21,834,274	3,807,228	4,490,004
Mechanical Eng.	30,377,667	2,516,557	2,888,683
Chemical Eng.	18,488,843	1,894,299	1,271,204
Computer Science	11,749,637	1,548,311	869,083
Civil & Arch. Eng.	11,220,505	860,519	1,489,019
Dean's Office	367,723	158,000	182,095
Totals	137,481,701	27,364,252	24,713,251

MAJOR RESEARCH AWARDS

Dr. Moshe Kam, *Robert G. Quinn Professor of Electrical and Computer Engineering*, currently serves as the ACIN program's Technical PI. In FY 2003-04 ACIN received a \$9 million award of additional Defense Department funding. **Drs. Harish Sethu, Kapil Dandekar, Steve Weber** and **Bill Regli** serve as Co-PIs on the project. The research dollars were given for Phase IV of the program, which is managed by Drexel in partnership with Sarnoff Corporation. The Army's Communications-Electronics Command (CECOM) is the government Executive Agent for the program.

Wireless capabilities and ACIN's technological research were featured in the November 2003 edition of *National Defense* magazine in an article about the improvement of the U.S. military's tactical communications and data gathering capabilities.

(http://www.nationaldefensemagazine.org/issues/2003/Nov/Wireless_Technology.htm)

Dr. Karen Miu, *Associate Professor of Electrical and Computer Engineering*, was awarded a three-year, \$2.25 million DoD Multi-Disciplinary University Research Initiative grant from the Department of Defense. Dr. Miu is the PI with **Dr. Dagmar Niebur** and **Dr. Chika Nwankpa** as Co-PIs on the project, which is called, "Device Development for Remote Nondestructive Testing and Measurement of Power Systems." For this research five universities have joined forces to create a large-scale power system laboratory that will be virtually connected via the Internet and the RTMs.

Dr. Chika Nwankpa, *Professor of Electrical and Computer Engineering*, received a \$1.86 million award as PI from the Department of Energy for the project entitled, "PowerGrid Phase II: A Real-Time Reconfigurable Computation Engine." The Co-PIs on the project are **Drs. Prawat Nagvajara** (ECE), **Jeremy Johnson** (CS and ECE), **Karen Miu** (ECE) and **Dagmar Niebur** (ECE). The project is concerned with the continuation of work on the development of a real-time reconfigurable electric power grid simulator capable of analyzing the types and consequences of actual events such as line contingencies and generator outages on a large-scale electric power network. The New Jersey Institute of Technology (NJIT) is a subcontractor on the project.

Dr. Gary Friedman, *Professor of Electrical and Computer Engineering*, received a \$1.38 million NSF NIRT grant as PI, with **Dr. Nily Dan** (Chem. Eng.) as a Co-PI, for the project entitled, "NIRT: Magnetically Driven Assembly of Heterogeneous Nanosystems." In this project Drexel is partnering with Carnegie Mellon University, University of Pittsburgh and at the University of Akron.

****A complete list of the individual ECE research grant awards for FY 2003-04 is provided in Appendix B.*

INSTITUTIONAL ADVANCEMENT ACTIVITIES

Corporate Donors Include:

- **Unisys Corporation** provided a \$5K award in December, \$3K in support of Senior Design and \$2K for the ECE Faculty Fellowship Fund.
- **Independence Chapter/Old Crows** Electrical Engineering Scholarship
- **InterDigital Communications Corporation** - InterDigital Fellowship
- **Lockheed Martin Maritime Systems** - LMCO undergraduate scholarships in Electrical and Computer Engineering

The following list summarizes **ECE related Institutional Advancement/fundraising efforts** including industry visits by the Department Head in AY 2003-2004:

<u>Date</u>	<u>Company</u>	<u>Contact</u>
September 22, 2003	InterDigital	Alain C. Baincon/Rip Tilden
October 16, 2003	Unisys	Jim Manser & Kelly Rodeghiero
November 4, 2003	Exxon-Mobil	Sandy Mazzo-Skalski & Dick Brown
December 18, 2003	PECO Energy Liberty Cent.	Ann Meredith
January 8, 2004	Micron	Joseph Kawalec & Gary Gilliam
March 4, 2004	Lockheed Martin	Nafiz Karabudak
March 12, 2004	InterDigital	Alain C. Briancon
April 23, 2004	Sun Microsystems	Joe Trout & Joel Weninger
April 27, 2004	Verizon	John Filosa
July 12, 2004	Comcast	Ray Celona
July 28, 2004	Exelon Nuclear	William Coyle
August 5, 2004	Hewlett-Packard	Rick Maier, Dave Estes, James Gipson

ENROLLMENTS AND CURRICULUM

The FT freshman enrollments in ECE based on fall 2004 September census figures are 150 (50 Electrical Eng. (EE) and 100 Computer Eng. (CE)), which is approximately 5% increase compared to fall 2003 census. There are also 190 engineering freshman with undeclared majors, and we expect approximately 50 of these students to eventually choose EE or CE as their majors, which translates to an effective ECE freshman class of 200 for fall 2004. There were also 52 transfer students coming into ECE for fall 2004 (42 EE and 10 CE). 67% of ECE freshman are entering Computer Engineering compared to 61% in fall 2003. The average SAT score for engineering freshmen has increased from 1234 to 1241 compared to last year. There are a total of 750 undergraduates enrolled in the ECE Department and that number was about equally divided between EE and CE.

Fall 2004 figures show that 53 new MS and 9 new Ph.D. students have enrolled for the fall 2004 term. There are currently 135 MS and 55 Ph.D. students enrolled in ECE.

The number of research assistants (RA), graduate assistants (GA) and teaching assistants (TA) for fall 2003 are as follows:

54 RA (37 FTE)
 4 GA (2.5 FTE)
 26 TA (13.5 FTE)

Degrees conferred in AY 2003-04:
139 BS
59 MS
6 Ph.D.

ECE PH.D. DEGREES CONFERRED IN AY 2003-2004

Yifei Li

Dissertation title: *Optical Generation of Rapidly Tunable Millimeter Wave Subcarrier Using Microchip Lasers*

Supervising professor: **Peter Herczfeld**

Harsha Narravula

Dissertation title: *Performance of Parallel Algorithms on a Broadcast-Based Architecture*

Supervising professor: **Constantine Katsinis**

Dinesh Obalappa

Dissertation title: *Optimal Caching of Large Multidimensional Datasets*

Supervising professor: **Oleh Tretiak**

Anawach Sangswang

Dissertation title: *Uncertainty Modeling of Power Electronic Converter Dynamics*

Supervising professor: **Chika Nwankpa**

Hogyuan Shi

Dissertation title: *Packet Scheduling Strategies for Emerging Models in the Internet*

Supervising professor: **Harish Sethu**

Jie Wan

Dissertation title: *Nodal Load Estimation for Electric Power Distribution Systems*

Supervising professor: **Karen Miu**

NON-ECE PH.D. DEGREE CONFERRED IN AY 2003-04 ADVISED BY ECE FACULTY

Lalitkumar Bansal

Dissertation title: *Development of Fiber Optic Chemical Sensor for Detection of Toxic Vapors*

Supervising professors: **Mahmoud El-Sherif** and **Christopher Li**

FACULTY APPOINTMENTS, PROMOTIONS AND RESIGNATIONS

** Two new faculty members joined the ECE Department in AY 2003-04:*

Jaudelice Cavalcante de Oliveira received a B.S.E.E. degree from the Universidade Federal do Ceara (UFC), Ceara, Brazil, in December 1995. She received an M.S.E.E. degree from Universidade Estadual de Campinas (UNICAMP), Sao Paulo, Brazil, in February 1998 and earned a Ph.D. in Electrical and Computer Engineering from the Georgia Institute of Technology in May 2003. She joined Drexel University in July of 2003 as an Assistant Professor.

Dr. de Oliveira's research interests include the development of new protocols and policies to support fine grained quality of service provisioning in the future Internet, researching and developing traffic engineering strategies for Multi Protocol Label Switching (MPLS) networks and the design of solutions for managing heterogeneous and large computer networks.

From 1993-1995, Dr. de Oliveira worked as an intern at TELECEARA (former telecommunications agency of the state of Ceara, Brazil). There, she developed a simulation tool to study telephone networks. From 1996-1998, she worked on a project, in collaboration with TELESP (former telecommunications agency of Sao Paulo, Brazil). She designed new methods for link dimensioning, traffic routing, and blocking probability estimation in ATM networks, which were then prototyped and utilized by TELESP. From 2001-2003, Dr. de Oliveira worked on a project supported by NASA Goddard, elaborating new methods for quality of service provisioning in IP networks. Currently, her research includes collaborations with Cisco Systems and NASA Goddard.

Dr. de Oliveira was awarded a 4-year Ph.D. Program Fellowship from the Brazilian Ministry of Education Agency (1998-2002). She is a member of IEEE, IEEE-COMSOC, IEEE-WIE, ACM and Eta Kappa Nu.

Steven Patrick Weber received a B.S.E.E. degree from Marquette University in 1996 and his M.S.E.E. and Ph.D. in electrical and computer engineering from the University of Texas at Austin in 1999 and 2003, respectively. He joined Drexel in September 2003 as an assistant professor.

Dr. Weber's research interests focus on mathematical modeling of computer networks. His recent projects focused on optimal streaming policies for rate-adaptive streaming multimedia. Previously, his research focused on applying stochastic geometry to the study of wireless ad-hoc networks. His other research interests are in network economics and studying Internet topology.

From 1994-96, Dr. Weber interned at the MacNeal-Schwendler Corporation, where he developed simulations of the company's finite-element software for

electromagnetics. From 1996-97, Dr. Weber was a research assistant for the National Law Center on Homelessness and Poverty in Washington, D.C., studying the impact of the 1996 Welfare to Work Act on the homeless population. Dr. Weber was awarded a University of Texas MCD Fellowship (1997-99), a University of Texas College of Engineering Doctoral Fellowship (1997-2001) and a University of Texas Continuing Fellowship (1999-2000). He is a member of IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Chi and Pi Mu Epsilon.

Drs. Karen Miu and Harish Sethu were both tenured and promoted to Associate Professor of Electrical and Computer Engineering, effective fall 2004.

Dr. Bahram Nabet, *Professor of Electrical and Computer Engineering*, was appointed as an Associate Dean for International Programs in the College of Engineering. Dr. Nabet will be in charge of developing international programs for the College, leading and coordinating efforts to establish research collaborations at the graduate level as well as educational collaborations at the graduate and undergraduate levels.

Dr. Bruce Eisenstein, *Arthur J. Rowland Professor of Electrical and Computer Engineering*, was appointed Associate Dean in the College of Engineering and Executive Director of the Drexel Engineering Curriculum (tDEC). Dr. Eisenstein will lead Drexel's undergraduate engineering curriculum, and continue the tradition of Drexel as being the premier institution for engineering education.

FACULTY RECRUITMENT

The ECE Department is committed to strengthening and constantly improving the quality of education and research opportunities that it offers the students of the University. To retain and further strengthen our standing among the top ECE departments nationally, we must continue to excel in both research and education. This goal can only be achieved by continuously attracting the top faculty available nationally. The recruitment efforts in AY 2003-04 resulted in four offers made to outstanding individuals sought by top ECE departments across the country, with the successful recruitment of **Dr. Nagarajan Kandasamy**.

AY 2003-04 Faculty Recruitment Statistics:

Applications Received:	347
On-Campus Interviews:	13
Offers Made:	4
Faculty Recruited:	1

** One new faculty member joined the ECE Department in fall 2004:*

Dr. Nagarajan Kandasamy received his B.E. degree in Computer Science and Engineering from Anna University in 1995 and his M.S. in Computer Science and Engineering degree from the University of Connecticut in 1997. Dr. Kandasamy

received his Ph.D. in Electrical Engineering and Computer Science from the University of Michigan in January 2003, where he was a research assistant in the Advanced Computer Architecture Lab during his studies. His doctoral advisor at Michigan was Prof. John P. Hayes, who is the Claude E. Shannon Professor of Engineering Science. Dr. Kandasamy worked as a Research Scientist at Vanderbilt University's Institute for Software Integrated Systems following his graduation from Michigan and until joining Drexel.

Dr. Kandasamy's research and teaching interests are in dependable systems and computing, embedded and real-time systems, distributed systems, fault diagnosis, CAD, computer architecture, testing and verification of digital systems, operating systems and software engineering. He has published in the highly selective *IEEE Transactions on Computers* and in some of the most important conferences on computer engineering and computer science. He has obtained industrial experience at several private companies. He has expertise in multiple aspects of computer engineering, including algorithmic, software and hardware applications. His thesis and published work spans cross-disciplinary boundaries, including signal processing and controls. His work holds substantial potential for collaboration with the automotive and aerospace industries.

In addition, **Dr. Stewart Personick** who previously served as the E. Warren Colehower Endowed Chair Professor and Director of Telecommunications and Information Networking Center rejoined the faculty as a Distinguished Research Professor after a year's absence.

The **AY 2004-05 faculty distributions in the ECE Department** will be as follows:

Tenure Track	33
FT Auxiliary	2
Research	4
Adjunct	3
Affiliated	11

STAFF APPOINTMENTS

Wayne Hill was appointed as the Assistant Dean for the College of Engineering Facilities by Dean Guceri in December 2003. This appointment recognizes Wayne's many key responsibilities and outstanding contributions, not only in the ECE Department but also across the College of Engineering. Wayne will be in charge of providing oversight for the COE facilities, including the construction of Bossone Research Center and renovation of Commonwealth Hall.

Megan Parker-Johnson joined the ECE Department on November 1, 2004 as the new Research & Development Program Coordinator. Megan received her Bachelor of Arts degree in History from Brown University in June 2004. Her concentration was in Modern European History. As Research & Development Program Coordinator, Megan will be working closely with the faculty to provide assistance in research and

development projects, including grant proposal preparation. She will also be working with the Department Head on special projects related to research and development, including the production of departmental publications, Advisory Council activities, etc.

ECE ADVISORY COUNCIL

The two biannual ECE Advisory Council Meetings in AY 2003-04 were held on September 16, 2003 and April 28, 2004 in the Hill Conference Room of the LeBow Engineering Center. There was a good turnout of Advisory Council members and ECE Faculty at each meeting. The Advisory Council members took great interest in providing valuable feedback on the implementation of ECE Department's strategic goals and practical suggestions to help the Department achieve its goals. The faculty members greatly appreciated the engagement on the part of the Advisory Council members. Minutes from these meetings are available to Advisory Council members and faculty on the following password-protected web-page:
<http://www.ece.drexel.edu/admin/advisory.html>

During AY 2003-04, **Arthur C. Paolella**, **Ray Celona** and **William Coyle** were recruited to the ECE Advisory Council, while **Joseph Grimes** stepped down.

Dr. Arthur C. Paolella was appointed to the ECE Advisory Council in November of 2003. He graduated with a Ph.D. from the ECE Department and was Dr. Herczfeld's former student. He is now the President of his own company, Artisan Laboratories Corporation based in Jamison, Pennsylvania.

Raymond E. Celona, who is the Senior Vice President for IP Services at Comcast was appointed to the Advisory Council in July 2004. Ray received his BS in Commerce & Engineering from Drexel in 1986.

William Coyle, who is the Electrical/I&C Manager at Exelon was appointed to the Advisory Council in July 2004. Will received two degrees in electrical engineering from Drexel University: BSEE'73 and MSEE'77.

Joseph Grimes resigned from the ECE Advisory Council. He is currently the Plant Manager at Peach Bottom Nuclear Station for Exelon Nuclear. Mr. Grimes received his B.S. from Drexel University in 1979. In the time since then he has accumulated years of successful experience in management and operational support of nuclear and fossil power stations, including experience at more than five nuclear stations and multiple fossil plants. His experience includes construction and initial operational start-up of two nuclear units. Additionally, he has held various positions, contributing in the management of instrumentation and controls, computer hardware, software development and telecommunications.

FACILITY/LABORATORY IMPROVEMENTS

The construction of the new **Bossone Research Building** started in May 2003. As the construction of the new building and the renovation of Commonwealth Hall progressed, it began to significantly affect the occupants and the usability of the facilities in Commonwealth Hall. By the fall 2003 term, the ECE Department and the School of Biomedical Engineering, Science and Health Systems were fully in the midst of the ongoing construction and renovations and most normal activities could no longer be handled effectively. The faculty and laboratories remained in the building until space was provided to relocate. Gradually the most affected areas of the building were vacated to alternate spaces made available across the University. Finally, in March 2004 all the ECE Departmental and faculty offices and research labs were vacated from Commonwealth Hall to facilitate the rapid completion of the construction, with only the undergraduate labs remaining in the building. Due to the lack of adequate space, we could not accommodate all the existing labs, but had to distribute the available space based on current research needs and activity levels. Meanwhile, Commonwealth Hall was reassigned to ECE with the full support of Interim Provost Dr. Ali Houshmand. The ECE Department will be located on floors two through six in Commonwealth Hall and will also occupy the 2nd floor of the Bossone building along with a lab in the Nanotechnology facility on the 3rd floor of Bossone. The completion of the construction and relocation of the Department are expected to take place in February of 2005.

ECE FACULTY RETREAT

The Faculty retreat was held on September 17, 2003 at the Sugarloaf Estate. There were 31 department members present at the retreat. It was an opportunity to examine the state of all aspects of the Department (topics covered included graduate affairs, undergraduate affairs and more specialized topics on research group plans). This examination led to new implementation plans and goals for furthering the strategic objectives and continuing to improve the quality of the ECE Department. Details of the Faculty Retreat are posted on the ECE Web page: <http://www.ece.drexel.edu/reports/retreatpres.html>.

“ECE DIALOGUE” WITH STUDENTS

Dr. Nihat Bilgutay, Department Head, and **Dr. Kevin Scoles**, Associate Professor and Assistant Department Head for undergraduate affairs, continue to hold informal discussions with undergraduate students every quarter. The ECE dialogs allow students to discuss their views on education and related matters at Drexel, and to offer suggestions. The dialogs are organized to improve the learning atmosphere for students and faculty members; and to help the Department better understand students' views, concerns or suggestions.

The ECE Dialog meetings are held every quarter and are organized by the Drexel IEEE Student Chapter. The meetings are held in the late afternoon/early evening and pizza and soft drinks are provided. The meetings provide an overview of actions taken to address the issues raised at the previous meeting followed by an open discussion with the students about their current concerns, needs and wishes. The students have been very enthusiastic and engaging and expressed their satisfaction with the process. It is also clearly evident that the satisfaction level of the students has been steadily increasing since these meetings were initiated in AY 1999-00. The dialog meetings during AY 2003-04 were held on October 28, 2003, February 4, 2004, May 5, 2004 and July 22, 2004.

OTHER DEPARTMENTAL NEWS

Drexel University was re-designated by the National Security Agency as a **Center of Academic Excellence in Information Assurance Education** for the academic years 2004-2007. Drexel's application for re-designation was authored by **Dr. Moshe Kam**, and included a detailed university-wide "inventory" of courses, research projects, publications, review of information assurance policies and resources at the University; action plans and forecast of future development of the field at Drexel University; and a detailed mapping of Drexel University courses to NSA specific requirements (more than 100 in number). Designation as a CAEIAE is valid for three academic years, after which the school must reapply in order to retain its designation. Dr. Kam is the Center's Director, and was the principal author of Drexel's original application for the years 2001-2003. This is a major achievement for the University.

The NSA's National Centers of Academic Excellence in Information Assurance Education (CAEIAE) program, established in November 1998, helps NSA partner with colleges and universities across the nation to promote higher education in information assurance (IA). This program is an outreach effort that was designed and is operated in the spirit of Presidential Decision Directive 63 (PDD 63), Policy on Critical Infrastructure Protection.

Under this program, 4-year colleges and graduate-level universities apply to NSA to be designated as Centers of Academic Excellence in IA Education. Each applicant must pass a rigorous review demonstrating its commitment to academic excellence in IA education. During the application process applicants are evaluated against stringent criteria for measurement based on IA training standards set nationally by the Committee on National Security Systems.

CAEIAEs receive formal recognition from the U.S. government, as well as prestige and publicity, for their role in securing our nation's information systems. Students attending CAEIAE schools are eligible to apply for scholarships and grants through

the Department of Defense Information Assurance Scholarship Program and the Federal Cyber Service Scholarship for Service Program (SFS).

The ECE Department has established a **Post-master's Ph.D. Fellowship program** for up to 6 in-coming students for Fall 2005. Each fellowship will provide a \$2,000 a month stipend and full tuition, with 50% being provided by faculty grants as the RA match. 50% of the stipend will be provided by the Department and 50% tuition match will be provided by the University, which was approved by Interim Provost Ali Houshmand. The recruitment for these Fellowships will start in the fall of 2004. The following doctoral fellowships will be available for incoming graduate students in the fall of 2005: two Colehower Doctoral Fellowships, two PECO Doctoral Fellowships, and two ECE Doctoral Fellowships. 50% of the Fellowship will come from the ECE Department and the other 50% of the tuition comes from a Research Fellowship. We are hoping that these fellowships will help us recruit the top students to come to Drexel.

The ECE Department is planning to initiate Web-based graduate course offerings leading to MSEE degrees with Telecommunications and Power Engineering concentrations via the **Drexel e-Learning Program** beginning in the fall quarter of 2004.

Joerg Dickert, an exchange student from the Technical University of Dresden in Germany, spent the AY 2003-2004 at the Center for Electric Power Engineering at Drexel's ECE Department taking classes in electric power systems and performing research in the area of power system security analysis. In his free time, Joerg is an avid long distance runner. On November 2, 2003, Joerg Dickert was ranked number 298 out of nearly 35 thousand runners during the famous New York Marathon. With a finish time of 2:55:33, Joerg was only 45 minutes slower than the winner, Martin Lel (KEN), who won this year's event with a record time of 2:10:30. This places Joerg among the top 0.86% of the 34,703 men and women who finished the New York Marathon on 11/2/03.

The ECEngineer Newsletter, published by Dr. M. Shankar and Allison Steever, was distributed in July 2004. The newsletter featured developments and notable achievements of the Electrical and Computer Engineering Department's faculty, alumni, staff and students. The past newsletters are located on the Department's web page at:
<http://www.ece.drexel.edu/reports/newsletter.html>.

The COE hosted a **Blue and Gold Days Champagne Brunch** on Saturday, May 1, 2004. The event was organized to give alumni a chance to reunite with faculty, advisors and classmates. A number of ECE alumni attended the meeting and were joined by ECE faculty.

Karl Sohlberg, Assistant Professor of Chemistry, and **Patricia Gallagher**, Assistant Professor of Civil, Architectural and Environmental Engineering, received the 2004 Allen Rothwarf Teaching Award, named in honor of the deceased ECE professor. The

award was presented at the 2004 Faculty Recognition Dinner and Awards Ceremony at Behrakis Grand Hall on June 3, 2004.

In AY 2002-03, the Department's faculty members initiated **The ECE Faculty Endowed Fellowship Fund** to support graduate students in Electrical and Computer Engineering. The minimum amount required to officially establish an endowed fund is \$25,000. The Department's aim is to grow the fund as rapidly as possible through contributions from faculty, alumni and industry. Currently, the fund has reached approximately \$12,000 as of July 2004.

The sabbatical proposals of **Drs. Afshin Daryoush, Chika Nwankpa** and **Oleh Tretiak** for AY 2004-05 were approved. Dr. Daryoush will be on a six month sabbatical (Winter-Spring 2005 terms), while Drs. Nwankpa and Tretiak will be on full academic year sabbaticals.

Francis Herrmann passed away on Wednesday, December 3, 2003, at age 93. Fran taught for many years in our Department as an adjunct professor. He was a good friend of the ECE Department. He received his M.S.E.E. and M.S. Physics degrees from Drexel.

ECE STANDING COMMITTEE APPOINTMENTS

In accordance with the ECE Committee guidelines, the nomination, election and appointment process for ECE Standing Committee membership and chairmanship was conducted during Spring 2004 and was concluded in early June 2004. This process, which is conducted every three years, also includes the nomination and appointment of the Assistant Department Heads for Undergraduate Affairs, Graduate Affairs, and Planning and Development, who respectively chair the Undergraduate Affairs, Graduate Affairs, and Planning and Development Committees. Accordingly, the new committees and Assistant Department Heads were formally appointed for a three-year term, effective July 1, 2004 (i.e., July 1, 2004 through June 30, 2007).

The following Curricular and Research Group Coordinators were actively involved in successfully coordinating the nomination process:

Kapil Dandekar, *Telecommunications & Networking*

Harish Sethu, *Computer Engineering*

Paul Kalata, *Controls, Robotics and Intelligent Systems*

Fernand Cohen, *Image and Signal Processing and Interpretation*

Gary Friedman, *Electrophysics*

Chika Nwankpa, *Power Engineering*

The ECE Department is grateful to all the committee members, committee chairs and our Assistant Department Heads for their outstanding service during the past three years. In particular, we extend our sincere appreciation to **Drs. Shankar, Scoles** and **Tretiak** for their outstanding service to our Department in their crucial roles as

Assistant Department Heads. After many years of outstanding and dedicated service to our Department, Dr. Shankar and Dr. Tretiak have decided to step down as Assistant Department Heads to pursue other faculty duties. We deeply appreciate and thank them for their outstanding service. It is a privilege to have Dr. Scoles continue to serve as Assistant Department Head for Undergraduate Affairs and we welcome **Drs. Hrebien** and **Niebur** as our new Assistant Department Heads for Graduate Affairs and Planning and Development, respectively.

The new committee memberships are listed below, both by committees and by Curricular/Research Groups.

*** ECE Standing Committees ***
(July 1, 2004-June 30, 2007)

ECE Undergraduate Affairs Committee

Kevin Scoles , *Chair and Assistant Dept. Head for Undergraduate Affairs*
Prawat Nagvajara, *Computer Engineering*
Paul Kalata, *Controls, Robotics and Intelligent Systems*
Tim Kurzweg, *Electrophysics*
Bruce Eisenstein, *Image/Signal Processing and Interpretation*
Karen Miu, *Power Engineering*
Steven Weber, *Telecommunications and Networking*
Ed Gerber, *Assistant Dept. Head for PT/Evening Programs*
Wayne Hill, *ECE Staff*
To be Appointed, *UG Student Representative*

ECE Graduate Affairs Committee

Leon Hrebien, *Graduate Advisor & Assistant Dept. Head for Graduate Affairs*
Lazar Trachtenberg, *Computer Engineering*
Alex Meystel, *Controls, Robotics and Intelligent Systems*
Bahram Nabet, *Electrophysics*
Fernand Cohen, *Image/Signal Processing and Interpretation*
Dagmar Niebur, *Power Engineering*
Jaudelice de Oliveira, *Telecommunications and Networking*
To be Appointed, *Graduate Student Representative*

ECE Planning and Development Committee

Dagmar Niebur, *Assistant Dept. Head for Planning and Development, Chair*
Alex Meystel, *Computer Engineering*
Allon Guez, *Controls, Robotics and Intelligent Systems*
Peter Herczfeld, *Electrophysics*
Eli Fromm, *Image/Signal Processing and Interpretation*
Dagmar Niebur, *Power Engineering*
Afshin Daryoush, *Telecommunications and Networking*
Wayne Hill, *ECE Staff*
To be Appointed, *Graduate Student Representative*

ECE Faculty Recruitment Committee

Moshe Kam, *Chair*

Harish Sethu, *Computer Engineering*

Moshe Kam, *Controls, Robotics and Intelligent Systems*

Adam Fontecchio, *Electrophysics*

Oleh Tretiak, *Image/Signal Processing and Interpretation*

Karen Miu, *Power Engineering*

Kapil Dandekar, *Telecommunications and Networking*

To be Appointed, *Graduate Student Representative*

ECE Promotion and Recognition Committee

Promotion Sub-Committee

Bruce Eisenstein, *Chair*

Lazar Trachtenberg, *Computer Engineering*

Eli Fromm, *Controls, Robotics and Intelligent Systems*

Gary Friedman, *Electrophysics*

Athina Petropulu, *Image/Signal Processing and Interpretation*

Chika Nwankpa, *Power Engineering*

Bruce Eisenstein, *Telecommunications and Networking*

Awards Nominations and Recognition Sub-Committee

In addition to the membership of the Promotion Sub-Committee, this sub-committee includes the following members:

Tim Kurzweg, *Junior Faculty Representative*

Eric Gallo, *Graduate Student Representative*

*** Curricular/Research Group Representation on ECE Standing Committees ***

Computer Engineering

Prawat Nagvajara, *Undergraduate Affairs Committee*

Lazar Trachtenberg, *Graduate Affairs Committee*

Alex Meystel, *Planning & Development Committee*

Harish Sethu, *Faculty Recruitment Committee*

Lazar Trachtenberg, *Promotion & Recognition Committee*

Controls, Robotics and Intelligent Systems

Paul Kalata, *Undergraduate Affairs Committee*

Alex Meystel, *Graduate Affairs Committee*

Allon Guez, *Planning & Development Committee*

Moshe Kam, *Faculty Recruitment Committee*

Eli Fromm, *Promotion & Recognition Committee*

Electrophysics

Tim Kurzweg, *Undergraduate Affairs Committee*
Bahram Nabet, *Graduate Affairs Committee*
Peter Herczfeld, *Planning & Development Committee*
Adam Fontecchio, *Faculty Recruitment Committee*
Gary Friedman, *Promotion & Recognition Committee*

Image/Signal Processing and Interpretation

Bruce Eisenstein, *Undergraduate Affairs Committee*
Fernand Cohen, *Graduate Affairs Committee*
Eli Fromm, *Planning & Development Committee*
Oleh Tretiak, *Faculty Recruitment Committee*
Athina Petropulu, *Promotion & Recognition Committee*

Power Engineering

Karen Miu, *Undergraduate Affairs Committee*
Dagmar Niebur, *Graduate Affairs Committee*
Dagmar Niebur, *Planning & Development Committee*
Karen Miu, *Faculty Recruitment Committee*
Chika Nwankpa, *Promotion & Recognition Committee*

Telecommunications & Networking

Steven Weber, *Undergraduate Affairs Committee*
Jaudelice de Oliveira, *Graduate Affairs Committee*
Afshin Daryoush, *Planning & Development Committee*
Kapil Dandekar, *Faculty Recruitment Committee*
Bruce Eisenstein, *Promotion & Recognition Committee*

ECE SOCIAL EVENTS

- * ECE Faculty Retreat Dinner with Spouses/Guests (*September 17, 2003 at the Sugarloaf Estate*)
- * New Graduate Student Welcoming Reception/Pizza Party (*September 25, 2003*)
- * ECE Department Annual Holiday Dinner (*December 7, 2003 at Cuba Libre Restaurant*)
- * The Annual ECE International Holiday Party (*December 18, 2003*)
- * 2004 Blue and Gold Days COE Champagne Brunch (*May 1, 2004 at the Faculty Club*)
- * End of the Academic Year Faculty Meeting and Luncheon (*May 5, 2004 at the Academic Bistro*)
- * Senior Design Awards & Pizza Party (*June 3, 2004*)
- * Eta Kappa Nu Annual Faculty Roast (*June 4, 2004 at Cavanaugh's*)
- * Doctoral Student Degree Completion Pizza Party (*June 9, 2004*)
- * ECE Spring Party at the Bilgutays residence (*June 19, 2004*)

CHALLENGES AND GOALS FOR THE ECE DEPARTMENT IN AY 2004-2005

Hiring **high quality and nationally competitive faculty** in computer engineering will be the key goal for our recruitment efforts in AY 2004-05. Our enrollments have reached an equilibrium between Electrical Engineering and Computer Engineering in Fall 2004, with each having approximately 400 students. However, with two-thirds of the incoming freshman entering Computer Engineering, the enrollment balance will continue to shift toward Computer Engineering. The steady state figures will most likely be 60% CE to 40% EE at the undergraduate level. Since the majority of our current faculty members are in Electrical Engineering, we need to focus our faculty recruitment efforts on Computer Engineering. However, in future years we need to also focus on recruiting top faculty in growth areas in EE such as nanotechnology, MEMS, bioelectronics and other newly emerging fields that will provide the faculty base to ensure ECE Department's future growth. These areas are expanding dramatically, both at Drexel and across the nation.

Another major goal for this year will be to successfully recruit an individual of international reputation and outstanding research leadership to **fill the E. Warren Colehower Endowed Chair Professorship** in Information Networking and Telecommunications.

We need to continue building our Department and **strengthening the critical curricular and research areas** that are rapidly growing; particularly the areas of Computer Engineering, Nanotechnology, Biotechnology and Information Networking. In order to meet the challenges and maximize the vast opportunities available to us, the ECE Department must continue hiring and developing research facilities in these critical areas. We believe our Department has an excellent opportunity to increase its national and international visibility, and to raise its rankings to even greater heights through sustained growth and continued excellence in teaching, research and professional service.

The **ECE Strategic Plan** focuses on achieving the following **key goals**:

- Provide a strong, supportive environment for our new and established faculty alike while facilitating their continuous professional development and success. We must strive to develop and maintain state-of-the-art facilities combined with academic, research and general administrative support to ensure that our faculty members have the means to successfully compete for external funding opportunities and to reach their professional potential in both teaching and research.
- Support the development of new, and the continuation of existing large-scale, grant/contract activity in the ECE Department. It is also vital for the ECE Department to have funding diversity in wide-ranging research areas, involving the participation of a large segment of the faculty with a renewed focus on

new initiatives and interdisciplinary collaborations. These grants/contracts not only provide a more diverse research base for the Department, but also contribute significantly to enhancing the key quality metrics such as Ph.D. production, publications and other scholarly activities. This is essential to guarantee the success of the ECE Department as a nationally recognized department. We will also support the development of other major research centers in the ECE Department to reflect both existing and emerging strengths of the Department, such as in Computers and Information Networking, MEMS, Nanotechnology, Biotechnology, Microwave-Lightwave Engineering, Electric Power Engineering and Imaging and Computer Vision.

- Maintain and further strengthen the close ties that have been established in recent years with the ECE Advisory Council through regular council meetings and communications with individual members. With continued growth in enrollments, faculty size and research activity, the role of the ECE Advisory Council will be increasingly critical in providing us with guidance, feedback and assistance to reach our full potential. The close ties established with the ECE Advisory Council have been very helpful in creating and implementing the ECE Strategic Plan because we have had the full and active participation of the council members. We will also need the assistance of our Advisory Council members with institutional advancement and fundraising activities.
- We experienced a 5% increase in ECE freshman enrollments in Fall '04 compared to last year. This was primarily due to increase in Computer Engineering freshman enrollments, while the Electrical Engineering freshman figures were slightly lower. Our focus this year will be to continue the recovery from the 25% drop experienced in the freshman class in Fall '03. Also, we need to improve retention rates to graduation, which will effectively increase the number of students and enhance student/alumni satisfaction with their Drexel experience. The new graduate enrollments are similar to last year's. We completed the graduate curriculum restructuring that was initiated three years ago and are in the process of securing University approvals at this time. The curricular revisions have led to an attractive state-of-the-art graduate curriculum with sufficient diversity of offerings at all levels.
- Continue the aggressive and pro-active student recruitment at both the undergraduate and graduate levels with particular focus on improving the student quality. This effort will be coupled with a focus on recruiting more domestic graduate students, particularly at the Ph.D. level. To attract top-notch graduate students to Drexel, we will focus on obtaining additional national fellowships and establishing endowed graduate fellowships through fundraising, with the objective of increasing the number of Ph.D. graduates.
- Renovation of Commonwealth Hall and the construction of the new Bossone Research Enterprise Building is a very positive development for the ECE Department, College of Engineering and the University. The ECE Department will be moving into the state-of-the-art facilities in early 2005, which will play a

major role in further enhancing the Department's significant contributions to the educational and research enterprises at Drexel. This has been one of the key strategic goals of the ECE Department for the past decade.

- Proactively participate in fundraising efforts to enrich the academic and research programs, related resources and facilities in ECE with the goal of becoming one of the top 25 departments in the country.
- Over the past several years, we have made great strides in establishing an ABET 2000 outcomes-based assessment process and instruments in the College of Engineering. We have established an outcomes-based course assessment; ABET(a-k) Survey, and the Senior Exit Survey, all implemented via the Web and across the COE. We have also worked with the Institutional Research Office to revise the Co-op and Alumni Surveys and to incorporate the new ABET requirements. These efforts were essential to our highly successful ABET visit, which occurred in November 2001. We will continue to implement and improve the process, with particular focus on the Continuous Quality Improvement (CQI) aspects to help improve our national rankings. This effort will be crucial in our preparations for the next ABET visit in Fall 2007.

In AY 2004-05, the development of the new ECE Strategic Plan for 2006-2011 will be initiated. The process will involve all constituencies of the ECE Department, including the faculty, students, alumni, and the Advisory Board. The ECE faculty will work closely with the Drexel administration and our Advisory Council in the development of the new strategic plan.

APPENDIX A: COE HONORS DAY 2004 AWARD RECIPIENTS

The College of Engineering Honors Day Ceremony was held on February 25, 2004, in the Main Auditorium. The faculty, staff and students of the ECE Department were all well represented this year receiving the following outstanding awards:

*** Faculty ***

Lifetime Achievement Award, Dr. Eli Fromm
Robert Quinn Medal for Outstanding Leadership, Dr. Moshe Kam
Research Accomplishment Award, Dr. Chika Nwankpa

*** Staff ***

Support Staff Achievement Award, Kathy Bryant
Technical Staff Achievement Award, Brian Kravitz

*** Students ***

Graduate Student Research Award, Benjamin Yellen (Dr. Gary Friedman, Advisor)
Undergraduate Student Research Award, Richard Primerano (Dr. Moshe Kam, Advisor)
Robert Fischl Annual Prize in Electric Power Engineering Studies, Anthony P. Madonna
Lester Kraus Award, Matthew D. Garfield
Thomas W. Moore Endowed Fund, Richard A. Primerano
Robert G. Quinn Scholarship, Timothy J. Furman
Albert Soffa Endowed Scholarship, Long P. Huynh
Arthur W. and Blanche Garroway Vanaman Scholarship, Diemhung L. Bui
Boeing Engineering Award, Maxim Malikov
James G. and Anne M. Crouse Endowed Scholarship Fund, Kyle J. Delcampo
I. Ray Dunlap Scholarship, Saturnino Garcia and Salah M. Osman
Elmer W. Griscom Scholarship, Nicholas J. McGovern and Matthew J. Sternberg
Arnold H. Kaplan Scholarship, Zhu Lin and Savannah Trump
William F. Mitchell Special Opportunity Endowed Scholarship Fund, Charles Mai
Harry E. Muchnic Scholarship, Joseph W. DeMaio, Jimmy George, Abhishek Gulati and Aldrin Piri
NACME Engineering Vanguard Program, Anthony J. Ambriz, Regina M. Cagle, Salvator E. Manzur, Philip J. Marseille, Marcus B. Matthews and Marisol Saldana
Rohm and Haas Minority Scholarship, Alpha Bah
Milton Rosenberg Scholarship, Michal Cohen, Steven Crowell, Yonghong Lee and Iman Lordgooei
Herman Schaevitz Memorial Scholarship, Nevzat Cubukcu, Jong H. Hyun, Ri Jiang and Phuong N. Ngo
John Raymond Vollmar Endowed Scholarship Fund, Pritesh Patel and Joseph B. Saunders
Alvin W. Wene Engineering Scholarship, Zayd S. Hammoudeh and Paras D. Shah

Dean's Fellowship, **Anthony Deese, Gabriel Ford, Nicholas J. Kirsch** and **Michelle Sipics**

George Hill, Jr. Fellowship, **Sarod Yatawatta** (Dr. Athina Petropulu, Advisor)

Koerner Family Awards for Graduate Students of the College of Engineering, **Adam O'Donnell** and **David K. Yoo**

National Defense Science and Engineering Graduate (NDSEG) Fellowships, **Benjamin B. Yellen**

National Science Foundation Fellowship, **Eric M. Gallo** and **Adam O'Donnell**

National Science Foundation Integrative Graduate Education and Research Traineeship Program (IGERT) Fellowships, **Derek S. Halverson**

APPENDIX B: ECE DEPARTMENT FY 2003-2004 RESEARCH AWARDS

PI	Co-PIs	Sponsor	Title	Amount
K. Blank	M. Kam, W. Regli, H. Sethu, S.Weber, K.Dandekar	U.S. Army-CECOM	Applied Communications and Information Networking (ACIN)-Phase IV	9,039,700
K. Miu	D. Niebur,Nwankpa	ONR	Device Dev. For Remote NDT & Measurement of Power	2,254,157
C. Nwankpa	J. Johnson, Miu, Nagvajara, Niebur	U.S. Dept. of Energy	Power Grid- A Computation Engine for Large-Scale Electric Networks	1,856,736
G. Friedman	N. Dan	NSF	NIRT: Magnetically Driven Assembly of Heterogeneous Nanosystems	1,378,000
L. Hrebien		Centocor	Data Analysis and Development of Analytical Algorithms and Software	344,282
P. Herczfeld	Bystrom, W. Rosen	ONR	Hybrid Fiber Optic/Wireless System for High Capacity Military Comm.	340,682
K. Dandekar	H. Sethu	NSF	Practical Strategies Using Smart Antennas for Mobile AdHoc Networking	299,989
A. Fontecchio		NIST	Crytal Plasticity Object Oriented Finite-Element (OOF) Modeling	255,383
G. Friedman		Univ. of Illinois	NMR Detection of Gene Expression	220,032
K. Dandekar		NSF	Collaborative Research:Applied E&M Characterization of Wideband Multi	181,779
T. Kurzweg		PA Dept. of Health	In-Vivo Pre-Cancer Detection of Optoelectronically Enhanced Endoscopy	130,217
A. Fontecchio		PA Dept. of Health	Proof-of-Concept for Opt. Intraocular Press. Sensor to Detect Glaucoma	50,203
L. Hrebien		Athena, Inc.	AILS Pulse Wave Analysis and Data Fusion	50,019
M. Kam	S. Mancoridis	Lockheed Martin	Evaluation and Characterization of Software Reverse Engineering Tools	50,000
C. Nwankpa	J. Johnson, Miu, Nagvajara, Niebur	PJM Interconnect.	State-of-the-Art Parallel Comput. Algos. for State Est. & Power Flow	39,660
K. Miu		Hydro One	Dev. Of Trans. Asset Contin. Critically Using Power Syst. Anal. Tech.	30,000
T. Kurzweg		Univ. of Pittsburgh	System-Level Optical Modeling in Dense Urban Environments	24,999
K. Dandekar		Crow,Cork & Seal	MIMO AdHoc Battlefield Networks	17,500
K. Miu		NSF	CAREER: Elect. Power Dist. Systems: Theory, Application & Perform.	16,000
			Total:	16,579,338

Awards Listed Under Other Units with ECE Faculty Co-PIs:

* PI: Raj Mutharasan

Co-PI: **Mohana Shankar**

Title: "Ultrasensitive Continuous Tapered Fiber Biosensors for Pathogens and Bioterrorism"

Sponsor: National Science Foundation

Amount: \$455,917 (two awards: \$443,917 + \$12,000)

* PI: Surya Kaladindi (MSE)

Co-PI: **Gary Friedman**

Title: "Acquisition of a Field Emission Scanning Electron Microscope Equipped with Wavelength"

Sponsor: Army Research Office

Amount: \$155,230

* PI: Harry Kwatny (MEM)

Co-PI: **Chika Nwankpa**

Title: "State Estimation and Diagnosis for Electric Power Systems Under Adverse Conditions"

Sponsor: National Science Foundation

Amount: \$119,942

Total Awards Listed Under Other Units with ECE Faculty Co-PIs: **\$731,089**

Electrical & Computer Engineering Total: \$17,310,427*

College of Engineering Total: \$27,364,252

Drexel University Total: \$111,561,871

* includes \$731,089 in non-ECE listed awards

Note:

-% of CoE Awards:	60.6%	61.6%*
-% of DU Awards:	14.9%	15.5%*

APPENDIX C: ECE DEPARTMENT FY 2003-2004 RESEARCH EXPENDITURES

<i>Electrical and Computer Engineering Total:</i>	\$13,523,163
	\$14,449,659*
 <i>College of Engineering Total:</i>	 \$24,713,251
 <i>Drexel University Total:</i>	 \$91,102,019

*includes \$926,496 for Gateway expenditures

Note:

-% of CoE Expenditures:	54%	58.5%*
-% of DU Expenditures:	14.8%	15.9%*

APPENDIX D: ECE AY 2003-2004 CURRICULAR/RESEARCH GROUPS

Computer Engineering

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
S. Basavaiah Jeremy Johnson Constantine Katsinis Spiros Mancoridis Alex Meystel Prawat Nagvajara Karkal Prabhu Warren Rosen Harish Sethu Lazar Trachtenberg	Jauelice de Oliveira Bill Freedman Oleh Tretiak Steven Weber Ruifeng Zhang	Harish Sethu

Controls, Robotics and Intelligent Systems

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Bill Freedman Eli Fromm Allon Guez Paul Kalata Moshe Kam Karen Moxon	Leon Hrebien Alex Meystel Karen Miu Dagmar Niebur Chika Nwankpa	Paul Kalata

Electrophysics

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Adam Fontecchio Gary Friedman Ed Gerber Peter Herczfeld Dov Jaron Ryszard Lec Peter Lewin Bahram Nabet Kambiz Pourrezaei Arye Rosen Kevin Scoles	S. Basavaiah Kapil Dandekar Afshin Daryoush Eli Fromm Karen Moxon Warren Rosen	Gary Friedman

Image and Signal Processing and Interpretation

Core Member

Nihat Bilgutay
Fernand Cohen
Leon Hrebien
Banu Onaral
Athina Petropulu
Aydin Tozeren
Oleh Tretiak
Aspa Zerva

Affiliated Members

Bruce Eisenstein
Eli Fromm
Moshe Kam
Stan Kesler
Ryszard Lec
Peter Lewin
Mohana Shankar
Lazar Trachtenberg
Ruifeng Zhang

Coordinator

Fernand Cohen

Power Engineering

Core Member

Karen Miu
Dagmar Niebur
Chika Nwankpa

Affiliated Member

Kevin Scoles

Coordinator

Chika Nwankpa

Telecommunications & Networking

Core Members

Kapil Dandekar
Afshin Daryoush
Jaudelice deOliveira
Bruce Eisenstein
Stan Kesler
Mohana Shankar
Steven Weber
Ruifeng Zhang

Affiliated Members

Nihat Bilgutay
Allon Guez
Peter Herczfeld
Tim Kurzweg
Ryszard Lec
Bahram Nabet
Prawat Nagvajara
Athina Petropulu
Harish Sethu

Coordinator

Kapil Dandekar

APPENDIX E: ECE DEPARTMENT COMMITTEES 2001-2004

ECE Faculty Advisory Committee

Kevin Scoles, *Undergraduate Affairs Committee - Chair*
Mohana Shankar, *Graduate Affairs Committee - Chair*
Edwin Gerber, *Assistant Department Head for Evening Programs*
Oleh Tretiak, *Planning and Development Committee - Chair*
Moshe Kam, *Faculty Recruitment Committee - Chair*
Fernand Cohen, *Promotion & Recognition Committee - Chair*

ECE Graduate Affairs Committee

Mohana Shankar, *Chair and Assistant Dept. Head for Graduate Affairs*
Fernand Cohen, *Image/Signal Processing and Interpretation*
Jaudelice de Oliveira, *Telecommunications and Networking*
Alex Meystel, *Controls, Robotics and Intelligent Systems*
Bahram Nabet, *Electrophysics*
Dagmar Niebur, *Power Engineering*
Harish Sethu, *Computer Engineering*
Eric Gallo, *Graduate Student Representative*

ECE Undergraduate Affairs Committee

Kevin Scoles, *Chair and Assistant Dept. Head for Undergraduate Affairs*
Ed Gerber, *Electrophysics*
Wayne Hill, *ECE Staff*
Leonid Hrebien, *Image/Signal Processing and Interpretation*
Paul Kalata, *Controls, Robotics and Intelligent Systems*
Stan Kesler, *Telecommunications and Networking*
Karen Miu, *Power Engineering*
Oleh Tretiak, *Computer Engineering*
Justin Refice, *Undergraduate Student Representative*

ECE Planning and Development Committee

Oleh Tretiak, *Chair and Assistant Dept., Head for Planning and Development*
Nihat Bilgutay, *Ex-Oficio*
Bruce Eisenstein, *Telecommunications and Networking*
Allon Guez, *Controls, Robotics and Intelligent Systems*
Peter Herczfeld, *Electrophysics*
Wayne Hill, *ECE Staff*
Alex Meystel, *Computer Engineering*
Dagmar Niebur, *Power Engineering*
Eric Gallo, *Graduate Student Representative*

ECE Faculty Recruitment Committee

Moshe Kam, *Chair*

Nihat Bilgutay, *Ex-Oficio*

Gary Friedman, *Electrophysics*

Karen Miu, *Power Engineering*

Athina Petropulu, *Telecommunications and Networking*

Leon Hrebien, *Image/Signal Processing and Interpretation*

Harish Sethu, *Computer Engineering*

Eric Gallo, *Graduate Student Representative*

ECE Promotion and Recognition Committee

Promotion Sub-Committee:

Fernand Cohen, *Chair*

Afshin Daryoush, *Telecommunications and Networking*

Eli Fromm, *Controls, Robotics and Intelligent Systems*

Kambiz Pourrezaei, *Electrophysics*

Lazar Trachtenberg, *Computer Engineering*

Awards Nominations and Recognition Sub-Committee:

Afshin Daryoush, *Chair*

Karen Miu, *Junior Faculty Representative*

Eric Gallo, *Graduate Student Representative*

****Note: Awards, Nominations and Recognition Sub-Committee also include members of the Promotion Sub-Committee.*

ECE Seminar Committee

Athina Petropulu, *Chair*

Nihat Bilgutay (*Ex Officio*)

Gary Friedman

Allon Guez

Chika Nwankpa

Harish Sethu

Ruifeng Zhang

ECE Senior Design Committee

Kevin Scoles, *Co-Chair*

Nihat Bilgutay, *Co-Chair*

Bruce Eisenstein

Ed Gerber

Wayne Hill

Leon Hrebien

Moshe Kam

Karen Miu

Harish Sethu

Ruifeng Zhang

Vasileios Nasis, *TA*

ECE Undergraduate Track Advisors Committee

Kapil Dandekar, *Telecommunications*

Paul Kalata, *Controls/Robotics*

Constantine Katsinis, *Computer Engineering*

Stan Kesler, *Telecommunications*

Prawat Nagvajara, *Computer Engineering*

Dagmar Niebur, *Power Engineering*

Kevin Scoles, *Electronics*

Oleh Tretiak, *Computer Engineering*

Named Professor Nominating Committee

Bruce Eisenstein, *Chair*

Nihat Bilgutay

Peter Herczfeld

Oleh Tretiak

**APPENDIX F: CURRICULAR/RESEARCH GROUP
REPRESENTATION ON ECE STANDING COMMITTEES
AY 2003-04**

Computer Engineering

Constantine Katsinis, *Faculty Recruitment Committee*
Alex Meystel, *Planning & Development Committee*
Harish Sethu, *Graduate Affairs Committee; Faculty Recruitment Committee*
Lazar Trachtenberg, *Promotion & Recognition Committee*
Oleh Tretiak, *Undergraduate Affairs Committee*

Controls, Robotics and Intelligent Systems

Eli Fromm, *Promotion & Recognition Committee*
Allon Guez, *Planning & Development Committee*
Paul Kalata, *Undergraduate Affairs Committee*
Moshe Kam, *Faculty Recruitment Committee*
Alex Meystel, *Graduate Affairs Committee*

Electrophysics

Ed Gerber, *Undergraduate Affairs Committee*
Peter Herczfeld, *Planning & Development Committee*
Bahram Nabet, *Graduate Affairs Committee*
Kambiz Pourrezaei, *Promotion & Recognition Committee*

Image/Signal Processing and Interpretation

Fernand Cohen, *Graduate Affairs Committee; Promotion & Recognition Committee*
Leon Hrebien, *Undergraduate Affairs Committee; Faculty recruitment Committee*
Athina Petropulu, *Faculty Recruitment Committee*
Oleh Tretiak, *Planning & Development Committee*

Power Engineering

Karen Miu, *Faculty Recruitment Committee; Promotion and Recognition Committee; Undergraduate Affairs Committee*
Dagmar Niebur, *Graduate Affairs Committee; Planning & Development Committee*

Telecommunications & Networking

Afshin Daryoush, *Promotion & Recognition Committee*
Athina Petropulu, *Faculty Recruitment Committee*
Bruce Eisenstein, *Planning & Development Committee*
Stan Kesler, *Undergraduate Affairs Committee*
Jaudelice de Oliveira, *Graduate Affairs Committee*

Graduate Group Coordinators

Fernand Cohen, *Image and Signal Processing*

Kapil Dandekar, *Telecommunications & Networking*

Gary Friedman, *Electrophysics*

Paul Kalata, *Controls/Robotics/Systems*

Chika Nwankpa, *Power Engineering*

Harish Sethu, *Computer Engineering*

Undergraduate Track Coordinators

Kapil Dandekar, *Telecommunications & Networking*

Paul Kalata, *Controls and Robotics*

Prawat Nagvajara, *Computers*

Chika Nwankpa, *Power and Energy*

Kevin Scoles, *Electronics*

APPENDIX G: PAST ECE DEPARTMENT AWARD AND RECOGNITION CEREMONY RECIPIENTS

Robert Quinn Outstanding Undergraduate Student Award Recipient

2003-2004 Iman Loordgoei and Hywitt Demisse

2002-2003 Anthony Paul Madonna and Ryan Scott Castro Spring

2001-2002 Gregory Goppold

Allen Rothwarf Outstanding Undergraduate Student Award Recipients

2000-2001 Andrew Fitting

1999-2000 Adam O'Donnell

Allen Rothwarf Outstanding Graduate Student Award Recipients

2003-2004 Yiming Mao and Xiaobo Hou

2002-2003 Salil Kanhere

2001-2002 Vishruta A. Dumane

2000-2001 Xiyang Chen

1999-2000 Xueshi Yang

Thomas Moore Teaching Award Recipients

2002-2003 Fernand Cohen

2000-2001 Bahram Nabet

1998-1999 Kambiz Pourrezaei

1996-1997 Robert Quinn

1995-1996 Peter Lewin

1994-1995 Ed Gerber

1993-1994 Banu Onaral

1992-1993 Thomas Moore

Alumni Award Recipients

2003-2004 John McCool

2002-2003 Stephen Squires

2001-2002 Xiang Wang

2000-2001 Dominic Villecco

1999-2000 Brian Butz

1997-1998 Mel Baiada

1996-1997 Arye Rosen

1995-1996 Harry Charles

1994-1995 William Feldbaumer

1991-1992 Fred Palmer

1990-1991 Isaac L Auerbach

1989-1990 John D. Rittenhouse

1988-1989 Harry Urkowitz

Martin Kaplan Award Recipients

2001-2002 Nihat Bilgutay
1997-1998 Kevin Scoles
1996-1997 Allen Rothwarf
1995-1996 Robert Fischl
1994-1995 Bruce Eisenstein
1991-1992 Richard Coren
1990-1991 Richard Beard
1989-1990 Isadore Cogan
1988-1989 Hun Sun
1987-1988 Martin Kaplan

Research Award Recipients

2003-2004 Karen Miu
2001-2002 Dagmar Niebur
2000-2001 Chika Nwankpa
1999-2000 Athina Petropulu

Staff Recognition Award Recipients

2003-2004 Tanita Chappelle
2003-2004 Scott Currie
2001-2002 Kathy Bryant
2001-2002 Wayne Hill