



Electrical and Computer Engineering Department



2004 - 2005 Annual Report

September 1, 2004 - August 31, 2005

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ECE Department Annual Report

September 1, 2004- August 31, 2005

Faculty Awards and Honors

Dr. Moshe Kam, *Robert G. Quinn Professor of Electrical and Computer Engineering*, was elected in November of 2004 to serve a one-year term beginning January 1, 2005, on the IEEE's Board of Directors as Vice President of Educational Activities.

Dr. Bruce Eisenstein, *Arthur J. Rowland Professor of Electrical and Computer Engineering*, was named Associate Dean in the College of Engineering and executive director of the Drexel Engineering Curriculum (tDEC) at the end of August 2004. Dr. Eisenstein will help guide Drexel's undergraduate engineering program, a national leader in innovation, and will continue Drexel's reputation as a premier institution for engineering education. He will focus on the "three Rs"—retention, relevance and relationship—to attract and retain the best students and address the challenges that have come with pervasive changes in the practice of engineering over the past decade.

Dr. Eisenstein was elected Treasurer and Chair of the Investment Committee of Eta Kappa Nu, the national electrical and computer engineering honor society.

Dr. Athina Petropulu, *Professor of Electrical and Computer Engineering*, was elected to serve on the IEEE Signal Processing Society Board of Governors in the capacity of Vice President of Conferences for 2006 through 2008. Also, Dr. Petropulu served as the General Chair for the IEEE International Conference on Acoustics Speech and Signal processing (ICASSP) held on March 18-23, 2005 in Philadelphia. **Dr. Nihat Bilgutay**, *Department Head and Vernon L. Newhouse Professor of Electrical and Computer Engineering*, served as the Finance Chair for the ICASSP conference.

Dr. Eli Fromm, *Roy A. Brothers University Professor/Director for Center of Educational Research*, will be a founding member of a new refereed ASEE publication that was announced at the June ASEE Annual Meeting and will be unique in engineering education circles. It will be electronic-based but not simply an electronic version of traditional static papers. This publication (Engineering Education Developments) is intended to be a place to publish articles that, in addition to their text, contain dynamic material such as video, simulations, active web links, etc. so that the reader will be able to view these important dynamic aspects of the "paper" in the context of the text. It will thus contain "papers" that could not be best presented in a traditional static mode. The expectation is that the first edition will be published sometime in 2006.

Dr. Fromm and the Gateway Coalition were honored by the International Network for Engineering Education and Research (iNEER) with the Recognition Award at the ICEE annual conference in October of 2004. Dr. Fromm was especially recognized for his leadership of the Gateway Coalition.

Dr. William Wulf, the President of the National Academy of Engineering (NAE), asked Dr. Fromm to serve on the Advisory Board to the NAE's Center of the Advancement of Scholarship on Engineering Education (CASEE). Dr. Fromm accepted the invitation.

Dr. Fromm was appointed to the Advisory Board of the Journal of Engineering Education. This is a new journal established to promote engineering education research and its first issue was slated to appear in January of 2005.

Dr. Fromm was also inducted into the National Academy of Engineering on October 3, 2004, along with 76 members and 11 foreign associates for "innovation and leadership in the development of a holistic curriculum for engineering education."

Dr. Chika Nwankpa, *Professor of Electrical and Computer Engineering*, and his graduate student, S. P. Carullo, received the, "IEEE Power Engineering Society Power Engineering Education Committee Technical Committee Prize Paper Award," for 2005 for their paper entitled, "Interconnected Power Systems Laboratory: A Computer Automated Instructional Facility for Power System Experiments." This paper was published in IEEE Transactions on Power Systems, Vol. 17, No. 2, in May 2002.

Dr. Jaudelice de Oliveira, *Assistant Professor of Electrical and Computer Engineering*, was the Local Arrangements Chair for SIGCOMM 2005, August 22-26, Philadelphia, PA. **Dr. Steven Weber**, *Assistant Professor of Electrical and Computer Engineering*, was the Web Chair for this conference.

Dr. Adam Fontecchio, *Assistant Professor of Electrical and Computer Engineering*, received the International Liquid Crystal Society Multi-Media prize at the International Liquid Crystal Conference in Slovenia.

Dr. Oleh Tretiak, *Robert C. Disque Professor of Electrical and Computer Engineering*, recently completed a year-long Fulbright Fellowship in Ukraine, where he taught at the Kiev Polytechnic Institute and lectured at Lyiv Polytechnic. While in Ukraine, Dr. Tretiak established a study abroad program between Drexel and Kiev Polytechnic University for students and faculty. This effort was supported by COE's **Dean Selcuk Guceri** and **Associate Dean for Special Projects Bahram Nabet**. The program's first Ukrainian participants, students **Victoria Yaremko**, **Olga Farina** and **Ruslan Akulenko** and instructor **Andrew Gusynin**, visited Drexel for two weeks in August. While at Drexel, they worked with professors in the School of Biomedical Engineering, Science and Health Systems and the Electrical and Computer Engineering Department on short

Staff Awards and Honors

Mr. Wayne C. Hill, *Director of Lab Services and Assistant Dean for College Facilities*, received the Harold M. Myers Award for outstanding service to the University at the Faculty Recognition Dinner on Wednesday, June 1, 2005. Wayne joined the ECE Department in 1981 and since that time has served the ECE Department, the College and the University in an exemplary and outstanding manner. Within ECE, the past two years have been somewhat tumultuous due to two valuable projects: the renovation of Commonwealth Hall and the construction of the new Bossone Research Enterprise building. Wayne lent his leadership and guidance to both of these projects, constantly going above and beyond what was expected of him in order make sure that things were progressing smoothly. Wayne's dedication, patience and super human efforts made the past two years far less traumatic for all of us, and we are indebted to Wayne for his invaluable service.

At the Employee Service Awards (see previous page) several staff members received recognition for their dedicated assistance and support:

Samuel Fairweather **5 years**
Michael Kennedy
Phyllis Delores Watson

Student Awards and Honors

The following ECE students received top honors in the June 2005 graduation for receiving the highest GPAs in their major:

Electrical Engineering:

1st Honors Eric Savage (3.90 GPA)
2nd Honors David Williams (3.80 GPA)

Computer Engineering:

1st Honors Saturnino Garcia (4.00 GPA)
2nd Honors Rajeev Iyer (3.80 GPA)

Regina M. Cagle, an Electrical Engineering sophomore, was one of the recipients of the 2005 Delaware Valley Engineers Week awards presented Saturday, February 26, 2005 at the Delaware Valley Engineers Week Banquet held at Villanova University. Regina was awarded the 2005 Undergraduate Scholarship Award sponsored by Urban Engineers, Inc.

Regina was also selected to receive a HENAAC scholarship. This award is sponsored by HENAAC and DaimlerChrysler. Regina was honored at the HENAAC Student Leadership Dinner which was held Saturday, October 8, 2005 in Anaheim, California as part of the HENAAC conference. As a HENAAC/DaimlerChrysler Scholar, Regina will receive a \$2,500 scholarship and conference package.

Shubham Bhat, a doctoral student of Dr. Timothy Kurzweg and Dr. Allon Guez, won the 2004 SPIE Optics East Best Student Paper Award for the paper entitled, "Simulation and Experimental Verification of Model-Based Optoelectronic Packaging Automation". The award was presented at the Optomechatronics Sensors, Actuators, and Control Conference, which took place in October.

Alia Sabur, an ECE Ph.D. student, was named "One of the Twenty Teens Who Will Change the World" by *TeenPeople* in April, a week before her 16th birthday. A week later she made her Carnegie Hall debut as principal clarinetist on Tchaikovsky's 5th Symphony with the N.Y. Youth Symphony, which is considered the best youth orchestra in the nation.

Eric Gallo received his second external grant from PTAP for the proposal, "Terahertz Source for Testing Nano Plasmonic Sensors," with his Ph.D. advisor, Dr. Bahram Nabet. The funding is for the amount of \$20K.

Derek Halverson, Dr. Gary Friedman's graduate student, was selected to receive the National Science Foundation Graduate Research Fellowship Award. This is one of the best funding opportunities for graduate students, offering a stipend of more than \$31K per year.

Joshua Freedman, a graduate student of Dr. Adam Fontecchio, was awarded an NSF Drexel University/University of Pennsylvania Integrative Graduate Education and Research Traineeship Fellowship for 2005-2006.

Graduate student **Hemang Shah** received a Grants-in-Aid-of-Research award from Sigma Xi. The grant was for approximately \$1,000 and was to support his research entitled, "3D Modeling of Liquid Crystals for Biophotonic Applications."

Dr. Prawat Nagvajara's students, **Gregory Panas**, **Nishant Desai**, **Owen Ferrel**, and **Amar Maniar**, won first place at the MicroMouse competition held at Rowan College, which was a part of the IEEE 2005 SAC Conference activities.

Team ECE-39, made up of **Patricia Jacques**, **Ryann Williams**, **Patrick Mathias** and **Girish Purswani**, won an Honorable Mention at the 2005 Techsymposium Poster Contest. This team was advised by **Dr. Dagmar Niebur**.

ECE senior design team members, **Manikantan Parameswaran**, **Mohammad Haghkar**, **Rajeev Iyer**, and **Shivika Singal**, advised by Dr. Prawat Nagvajara won honorable mention at the 2005 IEEE Philadelphia Section PCS Student Paper Contest for their paper "Embedded Multi-Processors for Load Flow Analysis: A Study."

Lit-Hsin Loo, Ph.D., Electrical Engineering, 2005, advised by Drs. Moshe Kam and Leonid Hrebien; received one of the four newly created Doctoral Awards sponsored by Drexel University. The awards, given with a cash prize, were created to honor graduating doctoral students for: Best Dissertation and Student deemed to have shown the most promise in enhancing Drexel's reputation. For both categories one student was chosen from Engineering and Science and one was chosen from Education, Humanities, Media Arts and Design, Information Science and Technology, Business, Nursing and Public Health. Lit-Hsin received his award in honor of the outstanding nature of his dissertation and career achievements, both of which reflected extremely well upon Drexel. Lit-Hsin is now at Harvard University working as a Post Doctoral Fellow.

Senior Design

Senior Design for 04-05 was complete as of Friday, May 27, 2005. The quality of work was very high, and selecting the prize winners presented a difficult task to the review committee. Each of these teams split a \$500 prize, funded either by the ECE Department or Unisys, our major Senior Design supporter. All of the winners are listed below.

ECE Department prize winners (ordered by group number):

- * ECE-17: "Multi-Purpose Inductive Device for Loading and Fault Experiments"
Students: **Antonios Boulos, Charles Mai, Craig Zemaitatis** (all EE)
Advisor(s): **Dr. Miu**

- * ECE-21: "Design and Construction of a Miniature Computer-Guided Rocket"
Students: **Bryan Bupp** (EE), **Gaurav Nail** (CE), **Richard Teichman** (MEM),
Leonardo Urbano (EE)
Advisor(s): **Drs. Kam, Guez**

- * ECE-39: "Energy Intelligent System"
Students: **Patricia Jacques, Patrick Mathias, Girish Purswani, Ryann Williams** (all EE)
Advisor(s): **Drs. Niebur, Eisenstein**, Reddy (CAEE)

Unisys Prize Winners (ordered by group number):

- * ECE-09: "Rapid Detection, Classification and Localization of Threats in an Urban Environment"
Students: **Matthew Chwastek, David Hamel, Jonathan Syfu** (all EE)
Advisor(s): **Drs. Dandekar, Kam**, Farouk (MEM)

- * ECE-29: "Efficient Implementation of AES on Smart Cards"
Students: **Matthew Gibbs, Christopher Kuebler, Alex Parisi, Bob Varghese**
Advisor(s): **Dr. Sethu**

- * ECE-33: "Adjustable Range Proximity Detection System,"
Students: **Anthony Arnone, Paul Toub, Joseph Vitale, David Williams**
Advisor(s): **Dr. Kandasamy**

There was a ceremony to honor the winners of the 04-05 ECE Senior Design Competition on Wednesday, June 8, 2005 in Bossone 310. Students on these teams received certificates and award checks.

The teams selected to represent the ECE Department in the COE Senior Design Competition were:

- *ECE-21: "Design and Construction of a Miniature Computer-Guided Rocket"
Students: **Bryan Bupp** (EE), **Gaurav Nail** (CE), Richard Teichman (MEM),
Leonardo Urbano (EE)
Advisor(s): **Drs. Kam, Guez**

and

- *ECE-39 (ECE Group): "Energy Intelligent System"
Students: **Patricia Jacques, Patrick Mathias, Girish Purswani, Ryann Williams** (all EE)
Advisor(s): **Drs. Niebur, Eisenstein**, Reddy (CAEE)

The CoE Senior Design competition took place on Wednesday, June 1 in the Hill Conference Room (LeBow 240). **ECE-21 received 2nd Prize** (\$1,000 award) and **ECE-39 received an Honorable Mention** (\$300 award).

Research Day 2005

ECE students and their faculty advisors are congratulated for receiving the **Undergraduate Dean's Awards** at the 2005 Drexel Research Day for the following posters:

- * Poster #405: "Trajectory Based Routing in Wireless Ad-Hoc Sensor Networks"
By: **Fernand S. Cohen, Josh B. Goldberg** and **Jaudelice C. de Oliveira**
Advisors: **Fernand S. Cohen, Jaudelice C. de Oliveira**
- * Poster # 379C: "Relay Selection in Wireless Networks that Employ User Cooperation"
By: **Frank X. Pihoda**
Advisor: **Athina Petropulu**

There were a number of **Honorable Mentions** from the ECE Department at the 2005 Research Day as well:

Creative Arts/Design: Graduate Student

- * Poster #276: "Monte Carlo simulation of transport in 2DEG via energy thermalization"
By: **Xia Zhao, Bahram Nabet**
Advisor: **Bahram Nabet**

Basic/Applied Science: Undergraduate Student

* Poster #248: "Transmission Line Modeling for a Reconfigurable Analog Engine for Load Flow Analysis of Power System Networks"

By: **Aaron St. Leger, Chika Nwankpa**

Advisor: **Chika Nwankpa**

Basic/Applied Science: Graduate student

* Poster #164C: "Manipulation of Non-Magnetic Materials in Ferrofluid Containing Media"

By: **Derek S. Halverson, Ben Yellen, Sameer Kalghatgi**

Advisor: **Gary Friedman**

* Poster #71: "Blind MIMO system estimation based on PARAFAC decomposition of HOS tensors"

By: **Yuanning Yu**

Advisor: **Athina Petropulu**

* Poster #255: "White-light spectroscopy as a pre-diagnostic method of early cancer detection"

By: **Elina A. Vitol, Bahram Nabet**

Advisor: **Timothy Kurzweg**

* Poster #48: "A Generating Function Approach to Analyze Random Graphs"

By: **Vilas Veeraraghavan**

Advisor: **Steven Weber**

* Poster #187: "On Achieving Software Diversity for Improved Network Security using Distributed Coloring Algorithms"

By: **Adam J. O'Donnell, Harish Sethu**

Advisor: **Harish Sethu**

Emerging Technology: Undergraduate student

Poster #341: "Inkjet Printing of a Polymeric Antenna"

By: **Brian P. Kerrigan, Carmen Baez, Jonathan McLeod, Irene Nakigudde, Michael Warde, Adam Fontecchio, Kapil Dandekar**

Advisor: **Adam Fontecchio**

Emerging Technology: Graduate student

* Poster #299M: "Analysis of N-1 Security-Constrained Economic Dispatch using a Linearized Model"

By: **Matthew J. Murach, Prawat Nagvajara, Jeremy Johnson**

Advisor: **Prawat Nagvajara**

* Poster #317: "Dynamic adaptation of bandwidth reservation and routing to traffic demand"

By: **Sukrit Dasgupta, Jean Philippe-Vasseur**

Advisor: **Jauelice De Oliveira**

* Poster #365: "Optimization of pressure response in HPDLC grating films based on polymer and nanoparticle doped composition"

By: **Kashma Rai, Adam Fontecchio**
Advisor: **Adam Fontecchio**

* Poster #393: "Symbolic Algebraic Techniques for Steady State Power System Analysis"

By: **Anupam Gopal, Dagmar Niebur, Werner Krandick**
Advisor: **Dagmar Niebur**

Undergraduate Student Government Association Elections

In May of 2005 the Undergraduate Student Government Association elected the new council for AY 2005-06. ECE student, **Seher Ahmad**, was elected the Student Life Assembly Commuter Representative.

COE Honors Day 2005

Michael Ermold and **David Yoo** were recipients of the Koerner Family Award for Graduate Students of the College of Engineering. This was Mike's first year as a recipient, while this was a continued award for David.

Jie Yu received the George Hill, Jr. Endowed Fellowship.

Alia Sabur was awarded the National Defense Science and Engineering Graduate (NDSEG) Fellowship.

Eric Gallo and **Adam O'Donnell** secured the continued funding of their National Science Foundation Fellowships.

Derek Halverson also secured a continuation of his funding. He is supported by the National Science Foundation Integrative Education and Research Traineeship Program (IGERT) Fellowship.

For a full list of Honors Day Awards, please see Appendix A.

T.A. Excellence Awards

The Drexel University T.A. Awards Ceremony was held on Wednesday, May 25 at the Faculty Club to formally recognize and thank the award winners. This year five ECE graduate students were recognized with T.A. Excellence Awards:

David Dorsey, Mathangi Ganapathy, Ekrem Gursoy, Preeti Mukundan, Jeremy Wang

Also, the following ECE students received an Honorable Mention:

Zayd Hammoudeh, Madhu Hosaagrahara, Shashank Saggur, Shodhan Shetty

Alumni News, Awards and Honors

Dr. Alfred Bove, B.S.E.E. '62, was appointed chief of cardiology at Temple University School of Medicine and Temple University Hospital. Dr. Bove was also chosen as the ECE Distinguished Alumnus of 2005. He is an emeritus professor of medicine at Temple University Medical School. He previously served as an Associate Dean at Temple University Medical School. He has conducted research in basic cardiac physiology, coronary disease, exercise physiology, environmental medicine and computer information systems in medicine. His current research, funded by the NIH and the Pennsylvania Department of Health, involves management of heart failure and cardiovascular risk factors using an Internet communication system for patient to physician communication. Dr. Bove is the Editor in Chief of the American College of Cardiology, educational web site: www.Cardiosource.com. He is an expert in web site design and medical database development. Dr. Bove also directs the Temple University Underwater Medicine program, which has provided postgraduate training in environmental medicine to over 400 physicians over the 31-year tenure of the program.

Dr. Bove received his B.S.E.E. from Drexel University in 1962, an M.D. from Temple University in 1966, and a Ph.D. in Physiology and Bioengineering from Temple in 1970. Dr. Bove is a member of the IEEE, a fellow of the American College of Cardiology where he currently serves as a member of the board of trustees, a fellow of the American College of Physicians, and a member of the Undersea and Hyperbaric Medical Society.

David Decampoli, B.S.E.E. '79, is currently the Vice President of Asset Management for Exelon Energy. In this capacity he is responsible for Exelon Energy Delivery's system planning function and the identification, selection and prioritization of capital and maintenance investments to improve the performance of the electric and gas energy delivery systems. He has worked as the Vice President and Chief Integration Officer for Exelon Energy Delivery, Vice-President of Regional Operations for ComEd and as the Vice President of Operations Strategy, responsible for the initial merger integration of PECO and ComEd energy delivery units.

Mr. DeCampoli serves on the Business Council and Board of Trustees of LaRabida Children's Hospital in Chicago and is a committee member of the Association of Edison Illuminating Companies Power Delivery Committee. He holds a Master's degree in organizational dynamics from the University of Pennsylvania and he and his wife Pam, live in Elmhurst, Illinois.

Dr. Benjamin Yellen, Ph.D. E.E. '04, was presented with the Benjamin Franklin Key Award for his "pioneering contributions in magnetic drug delivery systems to specific sites in the human body" at the 2005 IEEE Philadelphia Section Annual Awards & Recognitions Banquet. The function was held on Saturday, April 2, 2005 at the Union League of Philadelphia. The Benjamin Franklin Key Award recognizes an electrical engineer for outstanding technical innovation and technological contributions that have significant societal impact.

Ben received his Ph.D. in Electrical Engineering at Drexel in the fall of 2004 after having worked with Dr. Gary Friedman as his doctoral advisor. Currently, Ben is an NIH Postdoctoral Fellow at the Children's Hospital of Philadelphia and has accepted a faculty position that begins in the fall of 2005 as assistant professor of Mechanical Engineering and Materials Science at Duke University.

Ben was a finalist in the 2004 Collegiate Inventor Competition. The competition website can be viewed at: <http://www.invent.org/collegiate/2004finalists.htm>.

Additionally, a paper on which Ben was first author, "Arranging Matter by Magnetic Nanoparticle Assemblers" by **Benjamin Yellen**, Ondrej Hovorka and Gary Friedman was published in the June 2005 edition of the Proceedings of the National Academy of Sciences. This paper and the work that it referenced were primarily related to the research that Ben conducted for his thesis and were reviewed in the June 2005 issue of Nature Materials as well.

Melvin Garner, B.S.E.E. '64, and **John Kaewel**, B.S.E.E. '82 and M.S.E.E. '86, were Drexel's College of Engineering 2005 Engineers Week Alumni Circle of Distinction Award recipients.

Kenneth C. Dahlberg, B.S.E.E. '67, CEO of Science Applications International Corporation (SAIC) was inducted into the Drexel 100.

Professor Ismet Erkmen, who was Dr. Ron Wasley's Ph.D. student in the 80s, has been appointed Head of the Electrical and Electronics Department at the Middle East Technical University in Ankara, Turkey. This is one of the largest EE Departments in Turkey, with over 60 faculty members.

ECE Research Awards and Expenditures In FY 2004-2005

In FY 2004-05 the ECE Department once again attained the largest total research expenditures in the University. The total ECE Grant/Contract Awards including the multi-unit awards for FY 2004-05 (1 July 2004 to 30 June 2005) totaled \$15,343,288 (note: this corresponds to \$13,820,974 in grants with ECE faculty serving as PI and \$1,522,314 in joint grant totals where ECE faculty members are Co-PIs with PIs from units outside the ECE Department). The ECE total corresponds to 57.1% of the COE and 12.9% 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 2004-05 is attached to the report (Appendix C).

<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%
04-05	\$15,343,288	57.1%	12.9%

The combined ECE Grant Expenditures for FY 2004-05 (1 July 2004 to 30 June 2005) totaled \$14,304,121. The ECE total corresponds to 51.8% of the COE and 13.6% 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%
04-05	\$14,304,121	51.8%	13.6%

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'05 Research Activity Summary by College

College	Proposals	Awards	Expenditures
Medicine	206,421,341	64,568,880	44,166,183
Engineering	190,565,193	26,850,197	27,630,271
Arts & Sciences	41,723,110	8,398,683	8,371,565
Other Departments	534,723	2,614,503	8,282,490
Biomed	34,864,036	3,315,963	5,995,562
COMAD	492,468	256,950	2,670,990
Education	11,299,566	2,024,199	1,816,560
Nursing & HP	14,027,095	1,801,986	1,704,465
Public Health	12,123,306	2,268,082	1,387,112
CIST	9,567,703	922,401	1,052,896
Provost	10,681,788	1,719,442	960,286
COEPS	3,457,369	4,630,030	490,947
VP Student Life	1,856,195		255,862
Business	756,426	50,000	116,972
Totals	538,370,319	119,421,316	104,902,161

Largest Research Activity by Department at Drexel University

Department	Proposals	Awards	Expenditures
ECE	48,398,649	13,820,974	14,304,121
Microbiology & Immun.	61,851,786	24,010,728	8,652,673
Neurobiology & Anat.	33,562,935	3,340,260	6,342,113
Biomed	34,864,036	3,315,963	5,995,562
Pyschiatry	10,200,256	6,468,536	5,521,114
Biochemistry	24,405,606	2,097,460	5,257,857
Materials Science & Eng.	21,144,276	2,257,436	5,221,919
Pediatrics	20,762,844	3,842,180	4,800,996
Pharmac. & Phys.	10,250,516	5,304,817	4,057,337
Mechanical Eng. & Mech.	73,136,877	3,592,423	3,993,349
Totals	338,577,781	67,690,777	64,147,041

Departmental Research Activity in the College of Engineering

Department	Proposals	Awards	Expenditures
ECE	48,398,649	13,820,974	14,304,121
Materials Science & Eng.	21,144,276	2,257,436	5,221,919
Mechanical Eng. & Mech.	73,136,877	3,592,423	3,993,349
Chemical Eng.	19,612,989	2,990,035	1,836,510
Civil & Arch. Eng.	14,333,417	842,528	1,079,487
Computer Science	13,482,809	2,890,625	843,037
Dean's Office	456,176	456,176	351,848
Totals	190,565,193	26,850,197	27,630,271

Major Research Awards

In FY 2004-05 ACIN received a \$9.28M award of additional Defense Department funding for Phase V of the program. \$5.9M of this funding was designated for the Camden ACIN Incubator and a sub-contract to the Sarnoff Corporation. The program was managed by Drexel in partnership with the Sarnoff Corporation. **Dr. Moshe Kam**, *Robert G. Quinn Professor of Electrical and Computer Engineering*, and Dr. Bill Regli (CS) served, respectively, as technical director and associate technical director of the ACIN project and the ACIN Camden Center, located in Camden, NJ. The focus of the ACIN Camden Center is on the creation and demonstration of innovative telecommunications and information networking technologies, and the demonstration of proofs-of-concept for: secure, reliable, user-centered, wireless communication and networking platforms that leverage these technologies. Within this mission Drexel conducts several large scale projects on wireless communications (PIs: Regli and **Kam**), modeling and simulation (**PI: Kam**), mission planning (**PI: Weber**) and through-the-wall-detection (**PI: Friedman**). One of the recent highlights of the project was a demonstration of primary platform developed by the project, the ad hoc network SWAT in Ft. Dix, NJ.

Currently 8 projects are supported through ACIN, involving 12 faculty members (ECE, Computer Science, and Mathematics). The additional ECE faculty involved in 2004-2005 but not previously mentioned were, **Dr. Harish Sethu** and **Dr. Kapil Dandekar**. 43 students are educated in various projects, ranging from freshmen to post doctoral students. Past graduates from ACIN are highly sought by industry, and have been hired in the past by the NSA, the US Army, Lockheed Martin, Telcordia, Motorola and several other corporations. Project partners include the Sarnoff Cooperation, Lockheed Martin, and several other industrial partners. ACIN projects also serve as seed efforts to attract projects and funding from 3rd parties, most notably as part of the SAPIENT project (**PI: Mancoridis** and **Kam**).

Dr. Chika Nwankpa, *Professor of Electrical and Computer Engineering*, received a \$1.9 million award as PI from the Department of Energy for the project entitled, "Power-Grid Phase II - A Computation Engine for Large-Scale Electric Networks." This was a competing renewal and has brought the total budget for the project to \$3.76 million. The Co-PIs on the project are **Drs. Prawat Nagvajara** (ECE), **Jeremy Johnson** (CS and ECE), **Karen Miu** (ECE) and **Dagmar Niebur** (ECE).

Dr. Athina Petropulu, *Professor of Electrical and Computer Engineering*, was awarded an NSF grant for \$360K for her project, "NeTS NR ALLow Improved Access in the Network via Cooperation and Energy Savings (ALLIANCES)."

The Italian Ministry of Foreign Affairs allocated 250,000 Euros (\$325K) to establish a joint laboratory between Drexel University and the Italian National Nanotechnology Laboratory in Lecce, Italy. Dr. Roberto Cingolani of NNL and **Dr. Bahram Nabet** of the ECE Department will be co-directors of this unique transnational laboratory.

Dr. Adam Fontecchio, *Assistant Professor of Electrical and Computer Engineering*, received a \$317K NASA Young Investigator Award for his project entitled, "Lightweight Mirror with Electronic Controlled Focal Point for Remote Sensing."

Dr. Moshe Kam, *Robert G. Quinn Professor of Electrical and Computer Engineering*, was awarded a \$303K grant from the Office of Naval Research for his DURIP project entitled, "DURIP: Large Scale Instrumentation Facility for Simulation and Design of Distributed Control Plants." This project has the objective of building a full-scale instrumented distributed control network capable of duplicating and analyzing control architectures for current and future U.S. Navy ships.

Dr. Gary Friedman (PI), **Dr. Adam Fontecchio** (Co-PI) and Dr. Yuri Gogotsi (MSE) along with two University of Pennsylvania investigators were awarded an NSF Major Research Instrumentation grant totaling \$300K for their proposal, "Acquisition of ICP System Within Two Universities/One Campus Framework."

Institutional Advancement Activities

Corporate Donors Include:

- **Unisys Corporation** provided support for Senior Design and 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 and a gift of equipment
- **ExxonMobil** undergraduate scholarship support
- **PJM Corporation**

Two ECE alumni also made significant donations. Dr. Steve Squires '70, CTO of Hewlett Packard and Vince Vidas '59, '64, both purchased rows in Mitchell Auditorium, which is located in the Bossone Research Enterprise Center.

The following list summarizes **ECE related Institutional Advancement and Fundraising efforts** including industry visits by the Department Head in AY 2004-2005:

<u>Date</u>	<u>Company</u>	<u>Contact</u>
November 9, 2004	Exxon-Mobil	Sandy Mazzo-Skalski
December 3, 2004	DuPont	Robert Gruetzmacher
January 14, 2005	Westinghouse	Demetrios Karambelas
February 8, 2005	Agilent	Joseph McCaffrey
April 6, 2005	iBall	Curtis Sprouse/S. Reddy
April 15, 2005	Cybergrad	Dave Segal
April 26, 2005	Exelon	David DeCampi
May 3, 2005	iBall/NTM	S. Reddy/David Cade

Enrollments and Curriculum

The Fall '05 FT freshman enrollments in ECE based on confirms as of September 7, 2005 are 145 (70 Electrical Eng. (EE) and 75 Computer Eng. (CE)), which is approximately 10% decrease compared to fall 2004 census. 52% of ECE freshman are entering Computer Engineering compared to 66% in Fall 2004. There are also 139 engineering freshman with undeclared majors, and we expect approximately 35 of these students to eventually choose EE or CE as their majors, which translates to an effective ECE freshman class of ~180 for fall 2005. There were also 55 transfer students coming into ECE for fall 2005 (42 EE and 13 CE). There are currently 750 B.S. students enrolled in ECE.

Fall 2005 figures show that 78 new M.S. and 23 new Ph.D. students have enrolled for the Fall 2005 term. This is 3 fewer MS students and 7 more Ph.D. students than in Fall '04. There were 135 M.S. and 55 Ph.D. students enrolled in ECE based on the Fall 2004 census.

The number of research assistants (R.A.), graduate assistants (G.A.) and teaching assistants (T.A.) for Fall 2004 are as follows:

63 R.A.. (46 FTE)
 7 G.A. (3.5 FTE)
 28 T.A. (14 FTE)

Degrees conferred in AY 2004-05:

156 B.S.
 36 M.S.
 10 Ph.D.

ECE Ph.D. Degrees Conferred in AY 2004-2005

The following students defended their doctoral dissertations during AY 2004-2005. The graduate committee and the ECE Department congratulate them for their patience, perseverance, and commitment toward achieving the goal of Ph.D. completion.

A celebration in honor of their accomplishment was held Friday June 10, 2005 in the 3rd floor atrium of the Bossone Research Center.

Chris Dafis

Dissertation title: "An Observability Formulation for Nonlinear Power Systems Modeled as Differential Algebraic Systems"

Supervising professor: **Chika Nwankpa**

Marcelo Franco

Dissertation title: "Wideband Digital Predistortion Linearization of Radio Frequency Power Amplifiers with Memory"

Supervising professor: **Peter Herczfeld**

Xiaobo Hou

Dissertation title: "All-Optical Analog-to-Digital Converter up to 40 GSPS on Spatial Techniques"

Supervising professor: **Warren Rosen** and **Afshin Daryoush**

Rui Lin

Dissertation title: "On Using Diversity to Improve the Performance of Wireless Communication Systems"

Supervising professor: **Athina Petropulu**

Lit-Hsin Loo

Dissertation title: "Identifying Differentially Expressed Genes in DNA Microarray Data"

Supervising professor: **Moshe Kam** and **Leonid Hrebien**

Yiming Mao

Dissertation title: "Protection System Design for Power Distribution Systems in the Presence of Distributed Generation"

Supervising professor: **Karen Miu**

Sarod Yatawatta

Dissertation title: "Efficient Signal Processing Techniques for Future Wireless Communication Systems"

Supervising professor: **Athina Petropulu**

Benjamin Yellen

Dissertation title: "Magnetically Programmable Transport and Assembly of Colloidal Particles"

Supervising professor: **Gennady Friedman**

Jie Yu

Dissertation title: Modeling of High-Speed Wireline and Wireless Network Traffic"

Supervising professor: **Athina Petropulu**

Yingqin Yuan

Dissertation title: "Decision Fusion in Distributed Detection and Bioinformatics"

Supervising professor: **Moshe Kam**

Non-ECE Ph.D. Degree Conferred in AY 2004-05 Advised by ECE Faculty

Lalitkumar Bansal

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

Supervising professor: **Mahmoud El-Sherif** (former ECE Research Professor)

Stephen A. Mastro

Dissertation title: "Optomechanical Behavior of Embedded Fiber Bragg Grating Sensors"

Supervising professor: **Mahmoud El-Sherif** (former ECE Research Professor), Frank Ko (MSE)

Faculty Appointments, Promotions and Resignations

One new faculty member joined the ECE department in the Fall of 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.

Dr. Stewart Personick, who previously served as the E. Warren Colehower Endowed Chair Professor and director of the Telecommunications and Information Networking Center, rejoined the faculty as a distinguished research professor.

Dr. Paul Oh, of the Mechanical Engineering and Mechanics department, was appointed an Affiliated Faculty member of the ECE Department.

Dr. William Regli, of the Computer Science Department, was appointed an Affiliated Faculty member of the ECE Department.

Dr. Alexander Meystel, who retired at the end of August, was honored for his service to the University at the Faculty Recognition Dinner on Wednesday, June 1, 2005 in Behrakis Grand Hall. In his 21 years with the ECE Department, Dr. Meystel made many outstanding contributions to his field and to the University. Interim Provost Dr. Ali Houshmand approved Dr. Meystel's appointment as Emeritus Professor of Electrical and Computer Engineering effective at his retirement, so he will continue to be active in the department.

Dr. Constantine Katsinis accepted a position with and moved to the Goodwin College of Professional Studies.

Dr. Adam Fontecchio was appointed as Affiliated Faculty in the Department of Materials Science and Engineering.

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 2004-05 resulted in five offers made to outstanding individuals sought by top ECE departments across the country, with the successful recruitment of 3 outstanding new tenure-track faculty: **Dr. Bo Hong**, **Dr. Youngmoo Kim** and **Dr. Baris Taskin**. They will begin their appointments in Fall 2005.

Dr. Bo Hong received his Ph.D. from USC. Bo received his B.S. and M.S. degrees with honors from Tsinghua University in Beijing, China in 1997 and 2000, respectively. Bo's area of expertise is in parallel and distributed computing systems and performance optimization in high performance computing, which is one of the critical areas of Computer Engineering where our Department has important needs.

Bo has already published four articles in the top journals in his field, *IEEE Transactions on Parallel and Distributed Systems* and the *Journal of Parallel and Distributed Computing*. He has also contributed numerous articles to the top conferences in his field, including ICPADS and ICPP. Among Bo's research interests are energy aware data processing and connections between high-performance computing and computational biology. These are very challenging areas and address some of the most important questions in high-performance computing, which will provide Drexel students with exciting research and educational opportunities.

Dr. Baris Taskin received his Ph.D. from the University of Pittsburgh. Baris received his B.S. degree in Electrical and Electronics Engineering from the Middle East Technical University (METU) in Ankara, Turkey, in 2000, and his M.S. degree in Electrical Engineering from the University of Pittsburgh in 2003. Baris' area of expertise is in VLSI Design, a sub-topic of Computer Engineering in which the ECE Department has important educational and research goals.

Baris has been with the High Performance Integrated Circuit Group at the University of Pittsburgh since the year 2000. He also worked at a VLSI technology start-up company, MultiGiG Inc., Scotts Valley, CA, during the 2003-2004 academic year. His research interests include electronic design automation, advanced timing and synchronization methodologies for high-performance digital VLSI circuits, mixed-signal system design and optimization methodologies in general. Baris has published an article in the leading VLSI journal, the *IEEE Transactions on VLSI Systems*. Publication of an article is also pending in *IEEE Transactions on Computer-Aided Design*. He has also

presented his work in leading and highly respected conferences, including ACM International Symposium on Physical Design and IEEE ISCAS.

Dr. Youngmoo Kim received his B.S. in Engineering and B.A. in Music from Swarthmore College. He subsequently received his M.S. in Electrical Engineering and M.A. in Music from Stanford University. Finally, he received his Ph.D. in Media Arts and Sciences from the Massachusetts Institute of Technology. Dr. Kim was employed by Nellymoser, Inc. as a Senior Research Scientist from 2003-2005, where he led the research and development of audio compression algorithms.

Dr. Kim is an expert in music and audio analysis and synthesis, machine understanding of audio for information retrieval, and entertainment media technologies. He is also highly knowledgeable regarding international technical standards and intellectual property rights pertaining to digital media content. He participated in writing the widely-used Moving Pictures Experts Group (MPEG) standards.

Dr. Kim has published his work in numerous conferences and has a pending patent application. He has a very interesting and unique background that would bring highly valuable and diverse opportunities in research and education to the ECE Department and Drexel University. His expertise will provide opportunities to initiate projects in multi-media and entertainment, which is one of the most promising and fertile areas for the future of electrical and computer engineering.

Youngmoo, Baris and Bo will be outstanding additions to our faculty and will significantly strengthen our diversity as well as our computer engineering program.

AY 2004-05 Faculty Recruitment Statistics:

Applications Received:	347
On-Campus Interviews:	10
Offers Made:	5
Faculty Recruited:	3

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

Tenure Track	34
FT Auxiliary	2
Research	3
Adjunct	3
Affiliated	13

Staff Appointments

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 works closely with the faculty to provide assistance on research proposals and publications, special projects concerning research and development, the production of departmental publications, and recruitment. She is also the liaison to the Advisory Council.

Daniel Luig joined the ECE Department on July 18, 2005 as the Undergraduate Laboratory Assistant. Dan received an Associates degree in Electronics from Thaddeus Stevens College in 2005 and has experience working with students in a laboratory environment. Dan will be in charge of the Undergraduate labs and will be making sure that they run smoothly. Additionally, Dan's expertise using the milling machine will make him a technical resource. He is skilled at cutting circuit boards and will be providing that service for the department.

ECE Advisory Council

Dr. Barry Stein was appointed Chair of the ECE Advisory Council after Fred Palmer's decision to step down. Fred served as Chair from 1998-2004, and the ECE Department is indebted to him for his dedication and leadership. **Dominic Villecco** was appointed the first Vice Chair of the Council. The Department looks forward to working closely with both Barry and Dominic in the coming years.

The Advisory Council welcomed two new members in AY 2004-05, **Raymond E. Celona** and **William Coyle**. Mr. Celona is the Senior Vice President of Comcast IP Services and earned a BSC&E in 1986. Mr. Coyle is the Manager of the Electrical/I&C Divisions at Exelon Nuclear. He earned a BSEE in 1973 and an MSEE in 1977, both from Drexel.

Joseph Grimes resigned from the Advisory Council. He is currently the Plant Manager at Peach Bottom Nuclear Station for Exelon Nuclear. Mr. Grimes received his B.S. from Drexel in '79.

In addition to the larger Advisory Council, two sub-committees were formed in Fall 2004 to address two pertinent action items—the **Strategic Planning Sub-Committee** and the **Professional Ph.D. Sub-Committee**. Both committees are comprised of both Advisory Council members and Faculty members. **Dr. Tim Brophy** is the Chair of the Strategic Planning Sub-Committee. **Dr. David Houseman** is the Chair of the Professional Ph.D. Sub-Committee.

The two biannual meetings of the full Advisory Council were held on November 11, 2004 and May 25, 2005 in the Hill Conference Room of the LeBow Engineering Center. These meetings were opportunities for the faculty and the Advisory Council to discuss the many facets of the department and provide suggestions regarding how to move forward in the coming years. They were well-attended by faculty and Advisory Council members and were very productive. The minutes from these meetings are available online at the following password-protected webpage:

<http://www.ece.drexel.edu/admin/advisory.html>.

The sub-committees were also active in AY 2004-05. The Strategic Planning Sub-Committee held several meetings: one on May 12, 2005, one on August 9, 2005 and one on September 8, 2005. These were held in the Drexel University Faculty Club and in the ECE Department's conference rooms on the third floor of the Bossone Building. The Professional Ph.D Sub-Committee held a meeting on August 4, 2005 in ECE Conference room 304. Both groups have provided many valuable insights and have moved the Strategic Planning and Professional Ph.D. task items forward.

ECE Strategic Plan 2006-2010

Starting in May of 2005, the Strategic Planning Sub-Committee began to discuss Phase II of the ECE Strategic Plan. The first draft of the plan was distributed to the faculty and Advisory Council members just before the Faculty Retreat. It was the product of the combined efforts of the ECE Planning and Development Committee, headed by Dr. Dagmar Niebur, the ECE faculty and students, and the ECE Advisory Council members. The faculty members on Strategic Planning Committee members are: Dr. Dagmar Niebur, Dr. Nihat Bilgutay, Dr. Oleh Tretiak, Dr. Eli Fromm, Dr. Kevin Scoles, Dr. Peter Herczfeld, Dr. Moshe Kam, Dr. Afshin Daryoush and Dr. Leon Hrebien. Their Advisory Council counter-parts are: Dr. Tim Brophy (Chair), Dr. Barry Stein, Mr. Dominic Villecco.

Facility/Laboratory Improvements

The ECE Department began the move into the Bossone Research Enterprise Building on May 23, 2005. The Department is now almost completely settled into our new home. This marks the completion of a longstanding strategic objective for the Department. The facility is brand new, state-of-the-art and incredibly attractive. There are 155,000 square feet of laboratory space and the building will house labs from ECE, BioMed, MSE and MEM, facilitating a great deal of interdisciplinary research. The ECE Department is located on floors two through six in what used to be 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.

After having been dispersed across the University for the past two years, the ECE Department will now be in one building. This fact, along with the additional space and up-to-date resources, will have a major positive impact on the Department.

“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 2004-05 were held on November 3, 2004, February 2, 2005, May 4, 2005 and July 27, 2005.

Drs. Bilgutay and Scoles also held a group Senior Exit Interview in Bossone 310 on Wednesday, June 8, 2005. The purpose was to hear comments about seniors' experiences at Drexel; what they liked and what they did not like. The students were invited to submit their comments in writing or by email if they could not attend.

ECE Faculty Retreat

The Faculty Retreat was held on September 22, 2004 at The American College in Bryn Mawr, P.A. There were 30 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 process 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>.

Other Departmental News

Martin N. Kaplan, Francis C. Powell Professor Emeritus of Electrical and Computer Engineering, died on January 26, 2005 at age 85. Professor Kaplan graduated from Central High School in 1937 and received his bachelor's degree from Drexel University in electrical and computer engineering in 1943. After serving in the Merchant Marines during WWII, he began teaching at Drexel. He taught at Drexel University for 58 years, serving as assistant, associate and acting department head before becoming Powell Professor Emeritus upon his retirement in 1989. In 2003, he gained the distinction of being Drexel's oldest faculty member, teaching an ECE class at the age of 83. In addition to Doris, his wife of 63 years, Professor Kaplan is survived by daughters Judy Kaplan and Ruth Kaplan-Kramer, son-in-law Steve Kramer, grandson Joshua Kramer, brother Murray and nephew Ken. A memorial tribute was held March 10 in George D. Behrakis Grand Hall, with nearly 300 people attending.

Professor Kaplan established the Martin N. Kaplan Faculty Award Fund and supported many other scholarships and programs in the College of Engineering. In honor of his memory and his lasting impact on the department, the University and the lives he touched during his 60-plus years at Drexel, the ECE Department named the Martin N. Kaplan Electric Power and Machines Laboratory in his honor on June 17.

The **Annual ECE Awards and Recognition Dinner Ceremony** was held on Tuesday, July 19, 2005, at the Paul Peck Alumni Center. There were 43 people in attendance. The following awards were presented:

Eric Savage, The Robert Quinn Outstanding ECE Undergraduate Student Award

Eric Gallo and
Jie Yu, The Allen Rothwarf Outstanding ECE Graduate Student Award

Dr. Harish Sethu, The ECE Outstanding Research Achievement Award

Dr. Kevin Scoles, The Thomas W. Moore Distinguished Teaching Award

Dr. Alfred Bove, The ECE Distinguished Alumni Award

Dr. P. M. Shankar, The Martin N. Kaplan Distinguished Faculty Award for Exemplary Service

The ECE Department holds this event annually to express its great appreciation for the hard work and dedication of its faculty, students, staff and alumni.

For a full description of the awards and the individuals who were honored, please see Appendix B.

The **graduate curriculum** has been completely updated and the revisions to the courses have been finished.

The ECE Department will begin **web-based graduate course offerings** leading to an MSEE degree via Drexel E-Learning, Inc. (www.drexel.com) in Fall 2005.

Dr. Prawat Nagvajara has qualified to represent Thailand again as a member of the Thai Olympic cross-country ski team in the Torino Olympics in 2006.

At the University-wide Faculty Recognition/Retirees Dinner held on Wednesday, June 1, 2005, in Behrakis Grand Hall, **David Goldberg** of the Physics Department received the Allen Rothwarf Award for excellence in teaching by a junior faculty member.

A number of proposals from ECE faculty that were submitted to the, "Undergraduate Strategic Initiatives Mini-Grant Program," which was sponsored by the Provost's Office, were funded:

1. **Dr. Allon Guez**, "Business Systems Engineering," was developed and taught in Spring 2005.
2. **Drs. Jaudelice de Oliveira** and **Fernand Cohen**, "Integrating Sensor Networks in Undergraduate Curriculum," a new lab oriented course, was developed and taught in Spring 2005.
3. **Dr. Timothy Kurzweg**, "How Does My CD Player Work?" lab modules were developed for the third sequence of the Lightwave Engineering course and taught in Spring 2005.
4. **Drs. Adam Fontecchio** and **Eli Fromm**, "Silicon Chalk: Interactive Digital Classroom Presentations," the goal was to develop an interactive digital environment using wireless tablet PC's for introducing ECE courses (ECE 200 and 201). This was integrated into the ECE curriculum in Spring 2005.

The department supported each of the projects with matching funds to meet the needs of the projects. ECE has been the most proactive department in this initiative, receiving funding for the largest number of projects.

The **2006 U.S. News and World Report graduate rankings** were announced this spring, and the ECE Department joined the top 50 programs in the nation. The specialty rankings are based on reputation surveys; ECE improved from 54th out of 149 programs (64th percentile) in the 2005 survey to 50th out of 168 (70th percentile) in 2006.

The ECE Department played a large role in the summer educational outreach programs sponsored by the College of Engineering and the MEM and MSE Departments. **Drs. Kapil Dandekar, Adam Fontecchio, Nagarajan Kandasamy, Timothy Kurzweg, Prawat Nagvajara** and **Dagmar Niebur** ran the weekly ECE SEED laboratory. **Drs. Timothy Kurzweg, Bahram Nabet** and **Prawat Nagvajara** worked individually with high school students on research projects for the CoE Summer Mentorship program. **Drs. Jaudelice de Oliveira, Gary Friedman, Adam Fontecchio, Bahram Nabet** and **Athina Petropulu** worked with high school teachers on research projects for the RET and RET-Nano programs.

Challenges and Goals for the ECE Department in AY 2005-2006

Dr. Bilgutay has been serving as ECE Department Head since October 1995, thus completing his second 5-year term as department head at the end of AY 2004-05. Due to the Senate bylaws on department head term limits, a new department head needs to be recruited to replace Dr. Bilgutay. Dean Guceri has appointed a search committee to recruit the next department head during the new academic year. Dr. Bilgutay will remain as the Department Head until a replacement is recruited for this position. Finding a highly qualified individual to lead the ECE Department will be one of the major tasks for this year.

Hiring **high quality and nationally competitive faculty** in key areas of electrical and computer engineering will be the major goal for our recruitment efforts in AY 2005-06. This year we will focus on recruiting top faculty in growth areas in ECE such as signal processing and imaging with bio-applications, cyber security, nanotechnology, MEMS 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 Assurance, Networking and Telecommunications.

Our next ABET accreditation visit will occur in Fall 2007. It is therefore crucial to initiate the self-study and accreditation preparation process during AY 2005-06.

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.

One of the major goals in AY 2005-06 will be to develop the next Strategic Plan for ECE, covering the period 2006-10. The process was initiated during the summer of 2005 and will likely continue into early 2006. The process will involve all constituencies of the ECE Department, including the faculty, students, alumni, and the Advisory Council. The ECE faculty will work closely with the Drexel administration and our Advisory Council in the development of the new strategic plan.

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

- Provide a strong and supportive environment for our new and established faculty alike to facilitate 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 10% decrease in ECE freshman enrollments in Fall '05 compared to last year. This was primarily due to decrease in Computer Engineering freshman enrollments, while the Electrical Engineering freshman figures were higher. Our focus this year will be to increase the total enrollments in ECE. Another critical goal will be 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 slightly higher than last year's. We completed the graduate curriculum restructuring that was initiated three years ago and obtained University approvals. The curricular revisions have led to an attractive state-of-the-art graduate curriculum with sufficient diversity of offerings at all levels. However, improving curriculum is viewed as a continuous process that will be continued.
- 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. We have established four Post-Masters Ph.D. Fellowships in the Department 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.
- Completion of the 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 has started moving back into the state-of-the-art facilities in May 2005 and has now nearly completed the process except for the research laboratories. We expect to complete equipping all the research laboratories by the end of 2005. The new facilities will play a major role in further enhancing the Department's significant contributions to the educational and research enterprises at Drexel. It will also help faculty and student recruitment. 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.

ECE Social Events

- * New Graduate Student Welcoming Reception/Pizza Party (*September 19, 2004*)

- * ECE Faculty Retreat Dinner with Spouses/Guests (*September 22, 2004 at the Gregg Conference Center located at American College*)

- * The Annual ECE International Holiday Party (*December 16, 2004*)

- * ECE Department Annual Holiday Dinner (*December 19, 2004 at Konak Authentic Turkish Cuisine Restaurant*)

- * Graduate Program Information Meeting/Pizza Party (*January 12, 2005*)

- * 2004 Blue and Gold Days COE Champagne Brunch (*May 1, 2005 in the lobby of the Bossone Building*)

- * Eta Kappa Nu Annual Faculty Roast (*June 3, 2005 at Cavanaugh's*)

- * Senior Design Awards & Pizza Party (*June 8, 2005*)

- * Doctoral Student Degree Completion Pizza Party (*June 10, 2005*)

- * Dedication Ceremony for the Martin N. Kaplan Power and Machines Laboratory (*June 17, 2005*)

- * ECE Spring Party at the Bilgutays residence (*June 18, 2005*)

- * Annual ECE Awards and Recognition Ceremony (*July 19, 2005*)

Appendix A: CoE Honors Day 2005 Award Recipients

The College of Engineering Honors Day Ceremony was held on February 23, 2005, in Mandell Theater. The students of the ECE Department were all well represented this year receiving the following outstanding awards:

Graduate Student Research Award, **Erwei Lin** (Dr. Moshe Kam, Advisor)

Undergraduate Student Research Award, **Zayd Hammoudeh** (Dr. Moshe Kam, Advisor)

Boeing Engineering Award, **Ankan Basak**

Arnold H. Kaplan Scholarship, **Zayd Hammoudeh, Rajeev Iyer**

Harry E. Muchnic Scholarship, **Nishant Dhawan, Salah Mohamed Osman, Paras D. Shah, Savannah L. Trump**

Milton Rosenberg Scholarship, **Joseph B. Dorn, Saturnino Garcia, Anthony P. Madonna III, Eric C. Savage** and **Matthew J. Sternberg**

Herman Schaevitz Memorial Scholarship, **Joshua B. Goldberg, Eric G. Myers**

Alvin W. Wene Engineering Scholarship, **Joseph W. DeMaio, Zhu Lin, Aldrin J. F. Piri**

Dean's Fellowship, **Anthony Deese, Gabriel Ford, Eric Gallo, Derek Halverson, Nicholas Kirsch, Joshua Kodroff, Adam O'Donnell, Alia Sabur, Michelle Sipics** and **David Yoo**

George Hill, Jr. Fellowship, **Jie Yu**

Koerner Family Awards for Graduate Students of the College of Engineering, **Michael Ermold** and **David K. Yoo**

National Defense Science and Engineering Graduate (NDSEG) Fellowships, **Alia Sabur**

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

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

Robert Fischl Annual Prize in Electric Power Engineering Studies, **Yiming Mao**

Lester Kraus Award, **Antonios Boulos**

Thomas W. Moore Endowed Fund, **Thomas Gaffey**

Robert G. Quinn Scholarship, **Christian M. Schegan**

F.C. "Scotty" Powell Award of I.E.E.E., **Richard Primerano**

Arthur W. and Blanche Garroway Vanaman Scholarship, **Diemhung L. Bui**

James G. and Anne M. Crouse Endowed Scholarship Fund, **Kyle J. Delcampo**

Nathan Swerdlow Award, **Valentia Cecchi** and **Nevzat Cubukcu**

Arthur W. and Blanche Garroway Vanaman Scholarship, **Jeremy J. Boecker** and **Nicholas J. McGovern**

Appendix B: Full Description of ECE Department Award and Recognition Ceremony and Past Recipients

*** The Robert Quinn Outstanding Undergraduate Student Award ***

Eric Savage graduated in June 2005 from Drexel University having earned a Bachelor of Science degree in Electrical Engineering with a concentration in electronics. He graduated with a cumulative GPA of 3.90 on a 4.0 scale. While attending Drexel he received the Milton Rosenberg Scholarship and the H. Schaevitz award. Other awards that he has received include the Drexel University Dean's List and the A. J Drexel Scholarship. He is also a member of Tau Beta Pi and the National Dean's List.

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

Eric Gallo commenced his Drexel career in 1997 as an undergraduate in Electrical and Computer Engineering. He began research with Dr. Bahram Nabet in 1999 on semiconductor physics, in particular the physics of low dimensional electronic structures. He graduated with a B.Sc. and an M.Sc. in 2002, after which he continued on as a Ph.D. student with Dr. Nabet as his advisor. He currently serves as the Graduate Student Department Head, and on several departmental committees. He has also served on IEEE sectional and regional committees. Eric has been the Philadelphia Section IEEE Student Member of the Year, the recipient of the College of Engineering's Deans Fellowship and he was awarded a National Science Foundation Graduate Fellowship in 2002.

Currently, Eric is completing his doctorate on low dimensional electronic structures. A few months ago, he was awarded a \$20,000 grant from PTAP, an NSF/DARPA program for the acquisition of pre-commercial instrumentation. This was the second external grant of his career. He has also recently spent time in Italy developing new techniques for device fabrication and constructing various devices for his research group at Drexel.

Jie Yu received his B.Sc. in 1999 and his M.Sc. in 2001. He earned both of these degrees in Electronic Engineering from Tsinghua University in Beijing, China. He received his Ph.D. degree in Electrical and Computer Engineering from Drexel University in the spring of 2005 and was advised by Dr. Athina Petropulu.

His research interests are in the areas of statistical signal processing, communications and network engineering. He has been an IEEE member since 1999. He has served as a reviewer for the IEEE Transactions on Signal Processing and the IEEE Signal Processing Letters. He is the recipient of the 2004 George Hill Jr. Fellowship, an honor bestowed by the College of Engineering at Drexel University.

*** The ECE Outstanding Research Achievement Award ***

Dr. Harish Sethu obtained his B.Tech in Electronics and Communication Engineering from the Indian Institute of Technology (IIT), Chennai, in 1998 and his Ph.D. in Electrical Engineering from Lehigh University in 1992. Prior to joining Drexel University, he was an Advisory Development Engineer/Scientist at IBM Corporation. During his six-year tenure at IBM, he contributed to the hardware, software and system-level design of more than two generations of the SP family of computers (fastest family of computers in the world in 1998; best known for Deep Blue and its winning chess match against Kasparov).

Dr. Sethu was a recipient of the NSF CAREER award in the year 2000. He has been awarded three U.S. patents and is the principal or co-author of over 50 technical articles. He is also a recipient of the Eta Kappa Nu Best Teacher Award given to him by the outgoing senior year undergraduate students. He is a member of IEEE, ACM, ASEE, AMS and SIAM.

Dr. Sethu's background and current research interests span a diverse set of areas in computer engineering and computer science. His most recent research efforts have been in the design and analysis of protocols, architectures and algorithms in computer networks.

*** The Thomas W. Moore Distinguished Teaching Award***

Dr. Kevin Scoles received his undergraduate degree from Union College and his Ph.D. degree from Dartmouth College, both in physics. He has been on the faculty at Drexel since 1982. By his count, Dr. Scoles has taught 21 different courses at Drexel, the large majority being in the undergraduate day program, and has developed a large number of these from scratch. He has also published a number of journal and conference papers related to teaching and the assessment of teaching.

Dr. Scoles' teaching interests involve courses in which he can assist students in gaining a better understanding of physical electronic devices and systems, whether through theory, experiment or simulation. He is especially pleased with the ECE Lab I and IV courses, where part of the challenge is engaging both EE and CE students. ECE Lab I was taught by Dr. Scoles as first "Writing Intensive" course in the department last fall.

*** The ECE Distinguished Alumni Award ***

Dr. Alfred Bove, the recipient of the ECE Distinguished Alumni Award in 2005 is the Chief of Cardiology at Temple University Medical Center and emeritus professor of medicine at Temple University Medical School. He previously served as an Associate Dean at Temple University Medical School. He has conducted research in basic cardiac physiology, coronary disease, exercise physiology, environmental medicine and computer information systems in medicine. His current research, funded by the NIH, and the Pennsylvania Department of Health involves management of heart failure and cardiovascular risk factors using an Internet communication system for patient to physician communication. Dr. Bove is the Editor in Chief of the American College of Cardiology, educational web site: www.Cardiosource.com. He is an expert in web site design, and medical database development. Dr. Bove also directs the Temple University Underwater Medicine program, which has provided postgraduate training in environmental medicine to over 400 physicians over the 31-year tenure of the program.

Dr. Bove has published over 250 original research papers on coronary disease, valvular heart disease, cardiac hypertrophy, exercise, coronary prevention, environmental medicine, and computers in medicine. He has authored texts on coronary disease, exercise medicine and diving medicine. Dr. Bove received his B.S.E.E. from Drexel University in 1962, an M.D. from Temple University in 1966, and a Ph.D. in Physiology and Bioengineering from Temple in 1970. Dr. Bove is a member of the IEEE, a fellow of the American College of Cardiology where he currently serves as a member of the board of trustees, a fellow of the American College of Physicians, and a member of the Undersea and Hyperbaric Medical Society.

The Martin N. Kaplan Faculty Award for Distinguished Service

Dr. P. M. Shankar received both a Bachelors and a Masters degree in Physics from Kerala University (India). He earned a Masters (Applied Optics) and Ph. D. (EE) from the Indian Institute of Technology, Delhi. He was a visiting scholar at the University of Sydney, Australia from June 1981 to October 1982. He joined Drexel University as a post-doc in Biomedical Engineering in November 1982. He became a Professor in 1995.

He served as the graduate advisor in the ECE department from September 1993 to December 1997 and from September 1999 to June 2004. He also served as the Director of Graduate Programs for the College of Engineering from July 1996 to December 2000.

He has been involved in many initiatives to improve the quality of education that the College of Engineering (COE) offers. He was responsible for developing an M.S. in Software Engineering, an M.S. in Telecommunications Engineering, the general Master of Engineering as well the Career Integrated Education (CIE) in the College of Engineering. He led the efforts in the college to develop a B.S. in Software Engineering. He initiated the efforts that led to the creation of the Dean's Fellowship for graduate students in the college. This plan is now available for all graduate students in the University. He also put together scholarship programs for the students in the M.S./B.S. programs, which has led to an increase in the number of students in that program.

Past Recipients

Robert Quinn Outstanding Undergraduate Student Award Recipient

2004-2005 Eric Savage

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

2004-2005 Eric Gallo and Jie Yu

2003-2004 Yiming Mao and Xiaobo Hou

2002-2003 Salil Kanhere

2001-2002 Vishruta A. Dumane

2000-2001 Xiyang Chen

1999-2000 Xueshi Yang

The Thomas W. Moore Distinguished Teaching Award Recipients

2004-2005 Kevin Scoles

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

The ECE Distinguished Alumni Award Recipients

2004-2005 Alfred Bove
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

The Martin N. Kaplan Award for Distinguished Service Recipients

2004-2005 P. M. Shankar
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

The ECE Outstanding Research Achievement Award Recipients

2004-2005 Harish Sethu
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

Appendix C: ECE Department FY 2004-2005 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	9,280,237
C. Nwankpa	J. Johnson, Miu, Nagvajara, Niebur	U.S. Dept. of Energy	Power Grid- A Computation Engine for Large-Scale Electric Networks	1,907,203
A. Petropulu		NSF	NeTS-NR: Allow Improved Access in Network vai Coop & Energy Sav.	360,000
A. Fontecchio		NASA	Lightweight Mirror with Electron. Cont. Focal Point For Remote Sensing	316,573
M. Kam		ONR	Large Scale Inst. Facility for Simulation and Design Of Distributed Cont.	303,019
G. Friedman	A. Fontecchio, Y. Gogotsi	NSF	MRI: Acquisition of Inductively Coupled Plasma Etching System	300,000
J. de Oliveira	S. Weber	NSF	NeTS-NR: Pre-emption & Adapt. For Next. Gen. Multiservice Networks	270,000
P. Herczfeld		ONR	Hybrid Fiber Optic/Wireless System for High Capacity Military Comm.	249,792
B. Nabet	J. Spanier	Commonwealth of PA	4-One-Dimesional Tunable Nano Plasmonic Tetraherzt Sensors	117,177
D. Niebur	W. Krandick	NSF	Symbolic Algeb. Geometry Tech. for Power System Steady State Oper.	109,982
K. Dandekar		NSF	NeTS-Pro-WiN: Collab. Research: Exploiting Flexible PHYs in Networks	100,000
G. Friedman	A. Fontecchio, Y. Gogotsi	Ben Frankline Tech.	CoSh for MRI NSF Acquisition of Induc. Coupled	100,000
P. Herczfeld		ONR	Hybrid Fiber Optic/Wireless System for High Capacity Military Comm.	90,682
K. Blanck	M. Kam, W. Regli, H. Sethu, S. Weber	U.S. Army-CECOM	Applied Communication and Information Networking Phase IV	72,962
J. de Oliveira		Cisco Systems, Inc.	Design & Anal. Of Efficient Auto-Bandwidth Algos. for MLS Traffic Eng.	72,000
D. Niebur	H. Kwatny	Techno-Systems, Inc.	Electric Power System Management	49,949
D. Niebur		NSF	Conference Support- Int. Conf. on Intelligent Sys. Application	25,000
A. Fontecchio		NASA	NASA Graduate Student Researcher Program- Appl. For Mike Ermold	24,000
A. Petropulu		NSF	Energy Efficient Real Time Channel Est. Algos. For MIMO	15,008
G. Friedman		Ben Franklin Tech.	NTI Magnetically Controllable Drug and Gene Delivery Stents	15,000
A. Petropulu		NSF	NeTS-NR: Allow Improved Access in Networks via	12,000

A. Petropulu	NSF	Coop.& Energy Sav. Support for K-12 Female Students to Attend ICASSP 2005	5,140
T. Kurzweg	Int. Soc. For Opt. Eng.	SPIE Award: Optical Black Box	1,250
Total:			13,820,974

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

* PI: Spiros Mancoridis (CS)

Co-PI: **Moshe Kam**

Title: "SAPIENT: Approach to Synthesizing Adaptive Protocols by Selective Enumeration"

Sponsor: Lockheed Martin Corporation

Amount: \$717,751

* PI: **Arye Rosen** (Biomed/ECE)

Co-PI: Muhammed-Reza Tofighi

Title: "A Self-Contained, permanently Implantable, intracranial Pressure Sensor"

Sponsor: National Institute of Neurological Disorders

Amount: \$364,463

* PI: Robert Hicks (CS)

Co-PI: **Timothy Kurzweg**

Title: "Micromirror Arrays for Imaging Sensors"

Sponsor: National Science Foundation

Amount: \$340,000

* PI: Bradley Layton (MEM)

Co-PI: **Adam Fontecchio, Bahram Nabet**, Frank Ko (MSE), Jonathan Spanier (MSE)

Title: "Acquisition of a Nanomanipulation Device for Biological Electronic and Optoelectronic..."

Sponsor: National Science Foundation

Amount: \$100,100

Total Awards Listed Under Other Units with ECE Faculty Co-PIs: \$1,522,314

Electrical & Computer Engineering Total: \$15,343,288*

College of Engineering Total: \$26,850,197

Drexel University Total: \$119,421,316

* includes \$1,522,314 in non-ECE listed awards

Note:

-% of CoE Awards:	51.5%	57.1%*
-% of DU Awards:	11.6%	12.9%*

Appendix D: ECE Department FY 2004-2005 Research Expenditures

<i>Electrical and Computer Engineering Total:</i>	<i>\$14,304,121</i>
<i>College of Engineering Total:</i>	<i>\$27,630,271</i>
<i>Drexel University Total:</i>	<i>\$104,902,161</i>

Note:

-% of CoE Expenditures:	51.8%
-% of DU Expenditures:	13.6%

Appendix E: ECE AY 2004-2005 Curricular/Research Groups

Computer Engineering

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

Controls, Robotics and Intelligent Systems

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

Electrophysics

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

Image and Signal Processing and Interpretation

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Nihat Bilgutay Fernand Cohen	Bruce Eisenstein Eli Fromm	Fernand Cohen
Leon Hrebien Banu Onaral	Moshe Kam Stan Kesler	
Athina Petropulu Aydin Tozeren	Ryszard Lec Peter Lewin	
Oleh Tretiak Aspa Zerva	Mohana Shankar Lazar Trachtenberg	
	Ruifeng Zhang	

Power Engineering

<u>Core Member</u>	<u>Affiliated Member</u>	<u>Coordinator</u>
Karen Miu Dagmar Niebur	Kevin Scoles	Chika Nwankpa
Chika Nwankpa		

Telecommunications & Networking

<u>Core Members</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Kapil Dandekar Afshin Daryoush	Nihat Bilgutay Allon Guez	Kapil Dandekar
Jaudelice Cavalcante de Oliveira	Peter Herczfeld Nagarajan Kandasamy	
Bruce Eisenstein Stan Kesler	Tim Kurzweg Ryszard Lec	
Stewart Personick Mohana Shankar	Bahram Nabet Prawat Nagvajara	
Steven Weber Ruifeng Zhang	Athina Petropulu Harish Sethu	

Appendix F: ECE Department Committees July 1, 2004- June 30, 2007

ECE Faculty Advisory Committee

Kevin Scoles, *Assistant Department Head for Undergraduate Affairs Committee – Chair*
Leon Hrebien, *Assistant Department Head for Graduate Affairs*
Edwin Gerber, *Assistant Department Head for Evening Programs*
Dagmar Niebur, *Assistant Department Head for Planning and Development*
Moshe Kam, *Faculty Recruitment Committee- Chair*
Bruce Eisenstein, *Promotion & Recognition Committee-Chair*

ECE Graduate Affairs Committee

Leon Hrebien, *Graduate Advisor and 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*
Eric Gallo, *Graduate Student Representative*

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, *Undergraduate 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*
Eric Gallo, *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*
Athina Petropulu (*Interim while Dr. Tretiak is on sabbatical*), *Image/Signal Processing and Interpretation*
Karen Miu, *Power Engineering*
Kapil Dandekar, *Telecommunications and Networking*
Eric Gallo, *Graduate Student Representative*

ECE Promotion and Recognition Committee

Promotions Sub-Committee

Bruce Eisenstein, *Telecommunications and Networking, 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*

Awards Nominations and Recognition Sub-Committee

Timothy Kurzweg, *Junior Faculty Representative*
Eric Gallo, *Graduate Student Representative*

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

ECE Seminar Committee

Jauelice de Oliveira, *Chair*
Nihat Bilgutay (*Ex Officio*)
Gary Friedman
Allon Guez
Chika Nwankpa
Athina Petropulu
Harish Sethu
Ruifeng Zhang

ECE Senior Design Committee

Kevin Scoles, *Co-Chair*
Nihat Bilgutay, *Co-Chair*
Bruce Eisenstein
Edwin Gerber
Wayne Hill
Leonid Hrebien
Moshe Kam
Nagarajan Kandasamy
Karen Miu
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 G: Curricular/Research Group Representation on ECE
Standing Committees
AY 2004-05**

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*

Graduate Group Coordinators

Fernand Cohen, *Image and Signal Processing*
Gary Freidman, *Electrophysics*
Paul Kalata, *Controls/Robotics/Systems*
Chika Nwankpa, *Power*
Kapil Dandekar, *Telecommunications & Networking*
Harish Sethu, *Computers*

Undergraduate Track Coordinators

Kapil Dandekar, *Telecommunications/Signal Processing*
Paul Kalata, *Electrical Engineering/Controls and Robotics*
Prawat Nagvajara, *Computers*
Chika Nwankpa, *Electrical Engineering/Power and Energy*
Kevin Scoles, *Electronics*