

*Electrical and Computer Engineering
Department*

2002-2003 Annual Report



September 1, 2002 - August 31, 2003

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Electrical and Computer Engineering Department

Memorandum

To: Constantine Papadakis, President
Harvill Eaton, 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
Selcuk Guceri, Dean of Engineering

From: Nihat Bilgutay
Department Head

Date: October 29, 2003

Re: ECE Department Annual Report 2002-2003

Enclosed please find the Electrical and Computer Engineering Department's Annual Report for the AY 2002-2003. It is my pleasure to share with you the notable achievements and the key events and activities of our faculty, students and alumni that have continued to make the ECE Department successful and a key part of the University Community.

Cc: ECE Faculty
ECE Advisory Council
Ken Blank
Mun Choi
Richard Weggel
Lydia Kokolskyj

ECE Department Annual Report

September 1, 2002-August 31, 2003

Faculty Awards and Honors

- **Dr. Bruce Eisenstein**, Arthur J. Rowland Professor of Electrical and Computer Engineering, was selected as the recipient of the College of Engineering's Robert Quinn Medal for distinguished service to the College and Drexel University. The award is named after the late Professor Robert Quinn, who was one of the co-founders of the Enhanced Educational Experience for Engineers Program (E4), which is known today as Drexel's engineering curriculum (tDEC). The Robert Quinn award is given to an individual whose outstanding leadership exemplifies that of Dr. Quinn's. Dr. Eisenstein's numerous professional achievements include serving as IEEE president in 2000, being selected as Delaware Valley Engineer of the Year in 2000-2001 and most recently being elected as the East Region Director on the National Eta Kappa Nu Board of Directors. The term for this position is from July 1, 2002 until June 30, 2004.

Dr. Eisenstein received another outstanding recognition this year when he was inducted into The Drexel 100 along with 12 other distinguished alumni/alumnae. The Drexel 100 is the most prestigious alumni society and was created in 1991 in honor of the Drexel Centennial. Members of The Drexel 100 embody Drexel's heritage of excellence and achievement in professional fields, public service and philanthropic activities. The original members consisted of 100 alumni inducted in June 1992. Subsequently, 41 additional alumni were inducted.

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

Dr. Fromm received another major recognition for his paper and presentation entitled, "Innovations Which Changed the Engineering Educational Environment," which was selected by the Director of the UNESCO International Center for Engineering Education as the most outstanding at the Center's Conference held in Cairns, Australia. The February 2003 conference included attendees from 22 countries.

Dr. Fromm was also elected Fellow of the American Society of Engineering Education (ASEE) in recognition of his outstanding contributions to the Society. The 2003 induction of ASEE Fellows took place at the Annual Awards Banquet on June 25th in Nashville, Tennessee.

- **Dr. Ruifeng Zhang**, Assistant Professor of Electrical and Computer Engineering, was chosen to receive one of the IEEE Signal Processing Society's 2002 Best Paper Awards. Dr. Zhang's paper, published in March 2000, is entitled, "Network-assisted Diversity for Random Access Wireless Networks." The paper was co-authored by Michail Tsatsanis and S. Banerjee.
- **Dr. Chika Nwankpa**, Professor of Electrical and Computer Engineering, received the Best Paper Award in the Complex Systems Track at the Hawaii International Conference on System Sciences held January 6-9, 2003 for the paper entitled, "Experimental Studies and Modeling of an Information Embedded Power System." The paper was co-authored by Dr. Stephen Carullo, who was a post-doctoral fellow in the ECE Department at the time.

Dr. Nwankpa also received national recognition when he was interviewed by NPR National Public Radio, WPVI Channel 6 News, Philadelphia Inquirer and the Associated Press for his expert opinion regarding the blackouts that occurred in the Northeast in August 2003. He was questioned about the reasons behind the blackout, what the economic ramifications will be, and why PJM was able to save Pennsylvania from a blackout, but New York couldn't prevent it from spreading.

- **Dr. Karen Miu**, Assistant Professor of Electrical and Computer Engineering, was the recipient of the 2003 Lindback Career Enhancement Minority Junior Faculty Grant. The Faculty Recognition Dinner was held on Wednesday June 4, 2003 in Behrakis Grand Hall.
- **Dr. Adam Fontecchio**, Assistant Professor of Electrical and Computer Engineering, received a 2003 NASA Summer Faculty Fellowship at the NASA Jet Propulsion Laboratory in Pasadena, CA. There were 734 applicants for the program, with just 22 selected to JPL. The program was 10 weeks long, and Adam was given the choice of working with either the MEMS group or the Photonic Bandgap group. While at JPL, Dr. Fontecchio received weekly lectures and seminars from NASA scientists, tours of the facilities and workshops on conducting research with NASA and writing grant proposals.
- **Dr. Leonid Hrebien**, Associate Professor of Electrical and Computer Engineering, received the Professional Excellence Award of the Life Sciences and Biomedical Engineering Branch of the Aerospace Medical Association. Dr. Hrebien attended the Annual Scientific Meeting of the Aerospace Medical Association in San Antonio, May 3-8, 2003. He participated in a scientific panel sponsored by the Science and Technology Committee of the Aerospace Medical Association. The Professional Excellence Award is given for individual research

accomplishments and technical management achievements important to the advancement of life sciences and biomedical engineering, sustained over a number of years. This award is sponsored by Autoflug-Libelle.

- **Dr. Moshe Kam**, IEEE Board member and Robert G. Quinn Professor of ECE, was appointed as chair for the IEEE Audit Committee in 2004.
- **Dr. Stewart Personick** was appointed to the Federal Communication Commission's Technology Advisory Committee. The Committee meets once a quarter, and its Charter is to advise the Chair of the FCC and the FCC Chief Technology Officer/Chief Engineer on matters they request advice on.
- **Dr. Constantine Katsinis**, Associate Professor of Electrical and Computer Engineering, served on the program committee of the 2nd IEEE International Symposium on Network Computing and Applications, which was held April 16-18, 2003 in Cambridge, Massachusetts. He oversaw all financial responsibilities and reviewed papers submitted. The Conference was sponsored by the IEEE Computer Society and the Technical Committee on Distributed Processing.
- **Dr. Kevin Scoles**, Associate Professor and Assistant Department Head for Undergraduate Affairs in the ECE Department, received the "Recruitment Recognition Award," given by Drexel's Enrollment Management.
- **The College of Engineering Honors Day** was held on February 19, 2003 in the Main Auditorium. The ceremony is held annually to honor 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. Bruce Eisenstein received the Robert Quinn Medal for Outstanding Leadership

Dr. Peter Herczfeld was awarded the Research Accomplishment Award

Mr. Wayne Hill was presented with the Technical Staff Accomplishment award

Dr. Mohana Shankar was given the Service Accomplishment award

****A complete list of CoE Honors Day 2003 award recipients is attached in Appendix F*

- The **2003 Research Day** was held April 22, 2003 at the Daskalakis Athletic Center. ECE faculty members that received awards were:

10 to the 6th Club Members:

Moshe Kam
Chika Nwankpa
Stewart Personick
Peter Herczfeld
Warren Rosen

The **2003 Synergy Grant** was awarded for the paper entitled, “Decontamination of Large Flowing Volume of Air by Plasma Discharge,” which was authored by **Gary Friedman** (ECE) and Young Kim (Drexel Med).

- **The 2002 Employee Service Awards** were presented to the Drexel faculty and staff at a ceremony held Nov. 21, 2002 at the George Behrakis Grand Hall. The following members of the ECE faculty and staff were recognized for their dedicated service:

Warren Rosen	5 years
Renee Cohen	10 years
Scott Currie	15 years
William Freedman	15 years
Moshe Kam	15 years
Nihat Bilgutay	20 years
Kathy Bryant	20 years
Bruce Eisenstein	30 years

Student Awards and Honors

- The following ECE students received top honors in the June 2003 graduation for achieving the highest GPAs in their major:

1st Honors EE	Kunal Shah
1st Honors CE	Divyang Masrani
2nd Honors EE	Ryan Spring
2nd Honors CE	Prajwal Juvvadi

- **Yunkai Zhou**, a former Ph.D. student of Dr. Harish Sethu, was one of the two recipients of the George Hill, Jr. Fellowship for AY 2002-2003. Yunkai received his Ph.D. in Electrical Engineering in June 2003.

ECE and Biomedical Engineering graduate students, **Ben Yellen** and Zachary Forbes, won the first prize in the the Baiada Business Plan Competition. Their business plan was based on the collaborative work being performed by **Dr.**

Gary Friedman, Professor of ECE, and **Kenneth Barbee**, Associate Professor of Biomedical Engineering and Science.

- **Xiaobo Hou**, an EE Ph.D. student, received the second place award in the Best Student Paper Award competition at the 2003 Sarnoff Symposium. The paper, entitled, "Challenges of a GS/s All-optical Analog-to-Digital Converter" was written by Xiaobo Hou, **Afshin Daryoush**, Ralph Lachenmaier (NAWC, China Lake) and **Warren Rosen**. Xiaobo is a doctoral candidate advised by Drs. Warren Rosen and Afshin Daryoush.
- **Adam O'Donnell**, an ECE Ph.D. student working with **Dr. Harish Sethu**, received the Cisco Systems Information Assurance Scholarship Award. This prestigious award provides \$2,500 to the recipient, and is given to only four graduate and four undergraduate students nationally each year.

Adam also recently authored a book, "Hacker's Challenge 2." The book, written for network security professionals, is a collection of real-world security breaches and solutions, compiled as a series of challenges. The first edition of this book, in which Adam was a contributor, sold more than 70,000 copies.

- **Gustave Anderson**, a BS/MS student, received one of the "Class of 2003 Outstanding Co-operative Education Seniors" Awards. Gus works with **Dr. Moshe Kam** in the Data Fusion Lab. He was one of 11 Drexel students selected by the Awards Committee of the General Alumni Association Board of Governors from among 72 nominees submitted by the co-op employers.
- **Mike Ermold**, an ECE graduate student who works with **Dr. Adam Fontecchio**, received the 2003 NASA Graduate Student Researchers Program (GSRP) fellowship from Marshall Flight Space Center.
- **David Yoo**, ECE Ph.D. student advised by **Dr. Peter Herczfeld**, received an Honorable Mention for his outstanding academic achievements in the prestigious 2003 NSF Graduate Fellowship competition.
- ECE students **Nathaniel Curtis and Alan Whatley** were members of the team that conducted experiments on "Nanofiber Formation Under Reduced Gravity" aboard the NASA "Vomit Comet" KC-135 plane this summer. The experiment focused on the physical and chemical make-up of electrospun polymer fibers and verified the feasibility of an electrospinning device in zero gravity. Dr. Mun Young Choi, head of the Department of Mechanical Engineering and Mechanics, leads the project and advises the students.
- **Ashwin Menon and Sushmita Srikant** received the 2003 TA Excellence Awards. Ashwin and Sushmita are both ECE graduate students. The TA Excellence Awards Ceremony was held May 19, 2003 at the Faculty Club. The ECE Department was honored to have two of its TAs awarded in 2003. Having

two TAs from the same department recognized with this award in the same year is noteworthy.

- **Richard Primerano** received a \$5000 IEEE Student-Branch Leadership Scholarship for the academic year 2003-04, along with two other Philadelphia area ECE students. Rich is a BS/MS student working with **Dr. Moshe Kam**. This is the second year in a row Rich has received this scholarship award. He is a junior in the Electrical and Computer Engineering Department and is an active student leader of our IEEE Student Chapter. He is a student in excellent academic standing and has remained on the Dean's List since his freshman year. He is also an Anthony J. Drexel Scholarship recipient, which he maintains to the present date.
- The Drexel Battlebot team participated in the "North Carolina Robot Street Fight" on July 4th and 5th and progressed through two rounds of competition before it was damaged. The team finished in 6th place. The Battlebot team is the ECE-10 Senior Design Team: Semi-Autonomous Battlebot, with team members: Andrew J. Aiello (MEM), **James M. McClain (ECE)**, **Jeffrey U. Delos Reyes (ECE)**, Joseph C. Valinsky (MEM). The group is advised by **Dr. Moshe Kam**.
- The following ECE students received awards at the **2003 Research Day**:

CoE Dean's Award-Graduate:

Poster 78M Title: "Classification of SELDI-ToF Mass Spectra of Ovarian Cancer Serum Samples Using a Proteomic Pattern Recognizer" **Lit-Hsin Loo (ECE)**, John Quinn, **Leonid Hrebien (ECE)** and **Moshe Kam (ECE)**.

CoE Dean's Award-Undergraduate:

Poster 264C Title: "Broadband Digital Receiver for ISM Bands" **Ryan Spring, Liming Zhou, Michael Tran, Mitesh Patel, Greg Stzalka, Gabriel Lee, Donald Lafrance and Nathaniel Curtis (All are ECE students)**.

- **The ECE Senior Design Competition** was held the last week of May through June 2, 2003. Six projects received departmental awards and two were chosen to participate in the annual College of Engineering Design Competition. Each team was awarded a cash prize of \$500, which was divided among the members.

ECE Department Senior Design Awards were given to the following four groups:

ECE-10: Semi-Autonomous Battlebot (A)

Students: **J. Delos Reyes and J. McClain (ECE)**, A. Aiello and J. Valinsky (MEM)

Advisor: **M. Kam**

ECE-07: Underwater Coin Retrieval Robot
Students: **A. Liolios, M. Nicolaidis and J. Refice (ECE)**, B. McCurdy and J. Viray (MEM)
Advisor: **M. Kam**

ECE-41: The WCIU Mark II: A Modernized Controller for the AN/BRR-6B Towed Buoy
Students: **L. Angermiller, L. Fetters, T. McLaughlin, S. Ting (all ECE)**
Advisor: **L. Hrebien**

ECE-02: 5kW/10kW Power Converter for Fuel Cell Energy Conversion
Students: **M. Blasko, G. Lovercheck, K. Maynard, S. Pickett, A. StLeger, M. Walton, J. Yakaski (all ECE)**
Advisor: **C. Nwankpa**

Unisys Awards were given to the following two ECE teams:

ECE-16: Migration of an ASIC Design to FPGA for Prototyping and Verification
Students: **S. Jayachandran, Y. Lee, A. Szeto, T. Tran, C. Wilkerson (all ECE)**
Advisor: **S. Basavaiah**

ECE-03: Novel Architecture for Security Enhancement using SoPC
Students: **J. Bradley, B. Edwards, R. Halicks, E. Resto (all ECE)**
Advisor: **P. Nagvajara**

- **The College of Engineering Senior Design Competition** was held June 4, 2003.

The two teams that represented the ECE Department were:

ECE-10: *Semi-Autonomous Battlebot*
The team members were Andrew J. Aiello (MEM), **James M. McClain (ECE)**, **Jeffrey U. Delos Reyes (ECE)** and Joseph C. Valinsky (MEM). The team's advisor was **Dr. Moshe Kam**.

ECE-41: *The WCIU Mark II: A Modernized Controller for the AN/BRR-6B Towed Buoy*
The team members were **Laura Beth Angermiller (ECE)**, **Lance R. Fetters (ECE)**, **Timothy J. McLaughlin (ECE)** and **Sophy Ting (ECE)**. The group's faculty advisor was **Dr. Leonid Hrebien**.

The ECE-10 Team received the Second Place Award and a \$1,000 prize, while Team ECE-41 was recognized with the "Runner up Award" and a \$300 prize.

- **CoE Honors Day award recipients are:**

Graduate Student Research Award: **Salil Kanhere (Dr. Harish Sethu, Advisor)**

Undergraduate Student Research Award: **Gustave W. Anderson (Dr. Moshe Kam, Advisor)**

George Hill, Jr. Fellowship: **Yunkai Zhou (Dr. Harish Sethu, Advisor)**

Robert Fischl Annual Prize in Electric Power Engineering Studies: **Wan Jie (Dr. Karen Miu)**

Robert G. Quinn Scholarship: **William E. Norman**

Lester Kraus Award: **Yoba Amoah**

Thomas W. Moore Endowed Fund: **Manoj J. Chacko, Michal Cohen, Matthew D. Garfield, Anthony P. Madonna**

NACME Engineering Vanguard Program: **Lloyd T. Emelle, Jorge L. Garcia and Corrin Yates**

Alumni Awards and Honors

- **Dr. Michael Zoltowski**, Drexel ECE Department alumnus and a Professor at Purdue University, was awarded the IEEE Signal Processing Society's Technical Achievement Award for 2003. The award is given "To honor a person who, over a period of years, has made outstanding technical contributions to the theory and/or practice in technical areas within the scope of the Society, as demonstrated by publications, patents, or recognized impact in the field. Dr. Zoltowski was chosen for this prestigious award for his outstanding contributions over the last 15 years in which he focused on the theory and application of array signal processing and space-time signal processing for wireless communications.

Dr. Zoltowski's other recent achievements include being selected as a 2003 Distinguished Lecturer for the IEEE Signal Processing Society. The IEEE's Distinguished Lecturer Program provides access to individuals who are well known educators and authors in the field of signal processing to lecture at Chapter meetings.

- The following ECE alumni were inducted into the Drexel 100 in 2003:
Mel Baiada '82, '85
Charles Close '36
Dr. Bruce Eisenstein '65
Vince Vidas '59, '64

- Optinel Systems in Elkridge, MD has named **Dr. Tim Brophy**, BSEE '88, Ph.D. EE 1993, as Vice President. He will lead the optical engineering unit. Optinel Systems is a cable television industry optical transport systems provider.
- **Melvin C. Garner** BS, EE 1964, became the first African American president of the New York Intellectual Property Law Association (New York, NY). In 2005, he will become the first African American President of the American Intellectual Property Law Association. Mr. Garner, a partner in the intellectual property firm of Darby & Darby (New York, NY), specializes in the procurement and litigation or patent, trademark, trade secret and copyright matters involving technologies such as video circuits, cellular telephones, office products, medical products and computer hardware and software.
- **Alex J. Chanin** BSEE 1990, BS, CS 1990, has been appointed President of Stelex-TVG, Inc. (Bensalem, PA), a subsidiary of Vital Signs, Inc. (Totowa, NJ). Stelex-TVG provides enterprise-wide compliance solutions to regulated industries in the pharmaceutical, medical device, diagnostic and biotechnology sectors. The firm delivers a comprehensive suite of validation, technology and regulatory and business solutions. Vital Signs provide products and services to the hospital market and FDA regulated industries.
- **Dr. Lawrence Goren**, Hahnemann Alumni 1978, established a fund sponsoring a senior design team in EE, in honor of his father, Morton Goren, BSEE 1950.
- **James M. Bannon**, BSEE 1972, was promoted to Senior Vice President of STV Inc. (Douglasville, PA), an STV Group Inc. subsidiary, and named Director of Facilities Design with the firm's Central Group. STV Group is an engineering, architectural, planning and environmental and construction management firm employing more than 1,300 people nationwide.
- **Jay Bhatt**, MSEE 1986, received Drexel University's Harold Myers Distinguished Service Award in 2003. The Harold Myers Award is the University's most prestigious service award given to a member of the University administrative staff who has performed service above and beyond normal expectations of their position, whose service on one or more occasions has been recognized as significant in the life of the University, and is a contributor to the work of the University and its mission.

Jay has also become an honorary member of the Who's Who Historical Society. His biography appeared in their publication "International Who's Who of Professionals" in December 2003. Jay currently is an Information Services Librarian at the Hagerty Library.

ECE Department Awards and Recognition Dinner Ceremony

The Annual ECE Awards & Recognition Dinner was held Friday May 23, 2003 at the Faculty Club. The awards were given in recognition of the outstanding contributions and achievements of the ECE Department's faculty, staff, alumni and students.

The Robert Quinn Outstanding Undergraduate Student Awards

Anthony Paul Madonna is a senior Electrical Engineering major in the BS/MS program at Drexel. He works as a research assistant for the Center for Electric Power Engineering where he contributed to the development of the Reconfigurable Distribution Automation and Control Laboratory. In 2002, he spent six months working for PECO Energy. In 2003, he was employed by the System Protection Department of Conectiv Power Delivery.

Anthony has been the recipient of several awards and scholarships, including the Thomas W. Moore Endowed Fund (2003), the Dean's List and the A. J. Drexel Scholarship. He is a member of the National Society of Collegiate Scholars and has co-authored two research papers.

Ryan Scott Castro Spring was born in the Philippines on July 15, 1980. He left the Philippines when he was 15 years old to live in Bermuda where he continued his high school education at Warwick Academy. Ryan is a senior Electrical Engineering major with concentrations in RF electronics and Digital Signal Processing. His main interests are in the areas of antenna and RF circuit design.

Ryan has been the recipient of numerous awards and scholarships throughout his academic career at Drexel. He is a Dean's scholar, the recipient of the Harry Muchnic Foundation Scholarship (2001), the Milton Rosenberg Scholarship (2000, 2003) and the Merit Award (2003). Ryan and his senior design partners also co-authored a research paper under the supervision of Dr. Afshin Daryoush. He presented the paper at the 2003 IEEE Sarnoff Symposium and received the CoE Undergraduate Paper Award at the 2003 Research Day.

The Allen Rothwarf Outstanding Graduate Student Award

Salil Kanhere graduated from VJTI (Bombay, India) in 1998 with a Bachelor's degree in Electrical Engineering. He joined Drexel's ECE Department as a graduate student in 1998 and became a member of the Computer Communications Laboratory. Salil earned his Ph.D. in June 2003 under the guidance of **Dr. Harish Sethu**.

His research interests include the quality of service of computer networks, interconnection networks of parallel and distributed systems, switch and router design, mobile computing and systems and computer architecture. His Ph.D. dissertation was in the area of fair, efficient and low-latency scheduling in high-speed networks, with a

particular focus on achieving low implementation complexity for practical use in switches and routers.

Salil was a recipient of the Teaching Assistance Excellence Award in 1999 and received the Special Recognition in Teaching Assistance Award in 2001. He also received the Graduate Student Research Award from the College of Engineering in 2003.

The Thomas W. Moore Teaching Award

Dr. Fernand Cohen joined the ECE Department at Drexel University as a named Chair Associate Professor (George Beggs) in 1987. He is currently a Professor in the Electrical and Computer Engineering Department and is affiliated with the School of Biomedical Engineering Science and Health Systems. He serves as the Director of the Imaging and Computer Vision Center (ICVC). His research interests include pattern recognition, computer vision, medical image processing and applied stochastic processes.

Through a National Science Foundation grant, Dr. Cohen, along with **Dr. Athina Petropulu**, developed a state of the art Multi-Media Digital Signal Processing Laboratory, which introduces students to the interdisciplinary aspects of Digital Image/Signal Processing by designing hands on experiments drawn from diverse disciplines such as biomedical, multi-media and speech synthesis and recognition. This laboratory was also used as a platform for revamping a host of imaging courses that Dr. Cohen teaches at both the undergraduate and graduate levels. This work was disseminated in engineering education meetings and in journal and conference publications.

He received his B.Sc. degree in Physics from the American University in Cairo in 1978, and both his M.Sc. and Ph.D. degrees in Electrical Engineering from Brown University, in 1980 and 1983, respectively. After he received his Ph.D., he joined the Department of Electrical Engineering at the University of Rhode Island as an Assistant Professor. In 1985, he received the Research Excellence Award from the College of Engineering.

The Distinguished Alumnus/Alumnae Award

Dr. Stephen L. Squires, Hewlett-Packard Vice President and Chief Science Officer, received his B.S. in Electrical Engineering from Drexel University and his Ph.D. from Harvard. As an undergraduate freshman at Drexel, Squires gained valuable experience with the National Security Agency (NSA). He was recruited by NSA to work as an engineering intern in the advanced computing and communications laboratories, where he focused on the most challenging national security problems using advanced information technologies.

Squires joined Hewlett-Packard in November 2000. His responsibilities include establishing overall strategic, scientific and technical directions including the architecture of the digital renaissance for the 21st century internet in cooperation with HP Laboratories and, through the Technology Council, with HP businesses. Squires is

helping HP achieve sustainable strategic advantage from the frontier of future galactic-scale information systems, for all the people of earth, 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). His primary role involved responsibility for advancing the frontier of progressively larger sectors of information technology. He developed plans for, managed and directed the scalable systems parts of the DARPA Strategic Computing Program, the Federal High Performance Computing and Communications Program and its extension to the National Information Infrastructure. These programs are recognized as having helped enable the modern Internet, including its scalable parallel and distributed high-performance computing systems and the introduction of an explicit service layer.

The Distinguished Faculty Award for Fifty-five Years of Service

Professor Martin Kaplan joined Drexel's faculty in 1947. Kaplan earned a B.A. from Central High School in Philadelphia in 1937. He received both B.S. and M.S. degrees from Drexel University in 1943 and 1954, respectively.

During the late 40's, Professor Kaplan received a Professional Engineering License and wrote a textbook entitled, "Introduction to Alternating Current Machinery," which was published in 1948. He taught EE3 classes based on this textbook.

Over the past 50 years, Professor Kaplan has worked as an engineering consultant for numerous legal firms, specializing in electrical disasters. He worked as a consultant for Detroit Edison in the 70's to develop a course in Economic Decision Making for power engineers. He later rewrote the course and taught it to Drexel power engineering seniors.

In 1989, he was named Francis C. Powell Professor of Electrical Engineering. He has served as the ECE Department's Assistant, Acting and Associate Department Head at various times from 1973-1989. He has also been an active member of professional organizations including IEEE, American Society for Engineering Education and Eta Kappa Nu.

In 1975, he was presented the Lindback Award for Distinguished Teaching from Drexel. In 1988, he was honored with the inaugural presentation of the Martin N. Kaplan Distinguished Faculty award, which is given periodically to a faculty member who shows exemplary service and dedication to the ECE Department. Although he officially retired in 1989, he is still an active and valuable member of the faculty, and teaches courses in the Department.

The Distinguished Faculty Award for Fifty Years of Service

Dr. Hun H. Sun earned his Ph.D. from Cornell University in Electrical Engineering in 1955. He had already begun his career at Drexel at this time, working as an Assistant

Professor of EE from 1953 to 1956. He quickly moved up the academic ranks to become Ernest O. Lange Professor of Electrical Engineering and Biomedical Engineering & Science Institute.

During the next fifty years, he served as an NIH Special Fellow at MIT from 1963-64, as the Director for Drexel's Biomedical Engineering and Science Program from 1964-74, and as the Chairman for Drexel's Department of Electrical and Computer Engineering from 1973-78.

Throughout his career, he has been active in professional and honor societies such as Tau Beta Pi, Eta Kappa Nu, IEEE, AIMBE and Sigma Xi, where he served as President of the Drexel Chapter in 1965. He has published over 110 papers and books, including book chapters, and has earned five United States Patents. His professional activities include two Editor-in-Chief Positions, one with Pergamon Press for the Annals of Biomedical Engineering, and another for the IEEE Transactions on Biomedical Engineering. He has also worked as a Consultant to the Aerospace Research Laboratories at the Wright-Patterson Air Force Base in Dayton Ohio. He served as the President of the Philadelphia Chapter of the EMB group, and was awarded Drexel University's first Research Achievement Award in 1973.

*** See Appendix G for a complete list of past ECE Award Recipients

FY 2002-2003 ECE Research Awards and Expenditures

The total ECE Grant/Contract Awards including the multi-unit awards for FY 2002-03 (1 July 2002 to 30 June 2003) totaled \$12,194,223. This amount includes \$219,006 in joint grant totals where ECE faculty members are Co-PIs with PIs from units outside the ECE Department. The ECE total corresponds to 42.1% of the COE and 12.1% of the University totals for the same period. Note that this year's total DU awards and expenditures also include the former Hahnemann University colleges/schools. A list of the individual ECE research grant awards for FY 2002-03 is attached to the report (Appendix A).

<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%

The combined ECE Grant Expenditures for FY 2002-03 (1 July 2002 to 30 June 2003) totaled \$13,449,656. The ECE total corresponds to 53% 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%	15.9%

Major Research Awards

- **Dr. Stewart Personick**, the ACIN program’s Principal Investigator, received \$10 million of additional Defense Department funding in February 2003. The award was given for Phase III 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. Previously, the program received over \$17.5 million during the first two phases.
- **Dr. Peter Herczfeld** (PI), Lester A. Kraus Professor of Electrical and Computer Engineering, was awarded a \$909,353 grant from the Office of Naval Research. The project is entitled, “Hybrid Fiber Optic/Wireless System for High Capacity Military Communication.”
- **Dr. Moshe Kam** (PI), Robert Quinn Professor of Electrical and Computer Engineering, received \$296,226 in funding from the National Institute of Justice (NIJ) for the project entitled, “Proficiency Testing and Procedure Validation for Forensic Document Examiners.”
- **Dr. Athina Petropulu** (PI), Professor of Electrical and Computer Engineering, received \$226,334 in funding from the Office of Naval Research. The grant is for the project entitled, “Target Tracking and Sensor Fusion.”

Institutional Advancement Activities

Corporate Donors Include:

- Unisys Corporation - Senior Design
- 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 2002-2003:

<u>Date</u>	<u>Company</u>	<u>Contact</u>
October 23, 2002	Unisys	Jim Manser/Kelly Rodeghiero
November 5, 2002	Exxon-Mobil	Dick Brown
March 7, 2003	Personal	Mel Baiada
April 24, 2003	Personal	Fred Allegrezza
July 10, 2003	Personal	Fred Palmer
July 22, 2003	Personal	David Housman
July 25, 2003	Personal	Barry Stein

Enrollments and Curriculum

The FT freshman enrollments in ECE are based on fall 2003 September figures is 161 (62 Electrical Eng. (EE) and 99 Computer Eng. (CE)). There are 141 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 210 for fall 2003. 61% of ECE freshman are entering Computer Engineering compared to 70% in 2002. The average SAT score for engineering freshmen has increased from 1204 to 1234 compared to last year, with the EE student average SAT being among the highest at 1,259. In 2003, the average SAT scores increased by 28 points for CoE, 30 points for CE and 41 points for EE, which is a significant increase. There are a total of 846 undergraduates enrolled in the ECE Department.

Fall 2003 figures show that 159 new graduate students have confirmed to enroll this year, which is an increase of 35% compared to last year. Following is a summary of distribution of the confirmed new graduate students:

Distribution by Degree Program:

MSEE:	72
MS Telecom	21
MS Comp. Eng.	24
Ph.D.	42

Distribution of New Incoming Graduate Students by Country of Origin:

U.S.A.	50%
India	26%
China	11%
Other:	10%
Turkey	3%

These confirmed graduate student figures for fall '03 indicate a 21% increase for MS and a 100% increase for Ph.D. students.

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 2002-03:

130 BS

45 MS

9 Ph.D.

ECE Ph.D. Degrees Conferred in AY 2002-2003

Stephen Paul Carullo

Dissertation title: *Experimental Studies and Modeling of an Information Embedded Power System*

Supervising professor: **Chika Nwankpa**

Xiying Chen

Dissertation title: *Novel Heterostructure Metal-Semiconductor-Metal (HMSM) Photodetectors with Resonant Cavity for Fiber Optic Communications*

Supervising professor: **Bahram Nabet**

Meltem Alkan Izzetoglu

Dissertation title: *Weiner and Kalman Filtering for Self-Similar Processes*

Supervising professor: **Nihat Bilgutay, Banu Onaral and Birsen Yazici**

Arkady Kopansky

Dissertation title: *Joint Source-Channel Decoding for Robust Transmission of Video*

Supervising professor: **Maja Bystrom**

Vishruta Ajitkumar Dumane

Dissertation title: *Diversity and Compounding for Enhanced Discrimination of Breast Masses in Ultrasonic B-Scan Images*

Supervising professor: **M. Shankar**

Smadar Avraham Gefen

Dissertation title: *Wavelet-based Nonlinear Multi-dimensional Registration*

Supervising professor: **Oleh Tretiak**

Diana Lynn Hecht

Dissertation title: *Fault-Tolerant Distributed Shared Memory on a Broadcast-Based Interconnection Architecture*

Supervising professor: **Constantine Katsinis**

Salil S. Kanhere

Dissertation title: *Design and Analysis of Fair Efficient and Low-Latency Schedulers for High-Speed Packet-Switched Networks*

Supervising professor: **Harish Sethu**

Yunkai Zhou

Dissertation title: *Resource Allocation in Computer Networks: Fundamental Principles and Practical Strategies*

Supervising professor: **Harish Sethu**

**Biomedical Engineering Ph.D. Degree Conferred in AY 2002-03 Advised
by ECE Faculty**

Alexander Pinus

Dissertation title: *Current-Sensitive Magnetic Resonance Imaging Technique*

Supervising professor: **Oleh Tretiak**

Faculty Appointments, Promotions and Resignations

- **Dr. Arye Rosen** was appointed Academy Professor of Biomedical Engineering and Electrical Engineering in 2003.
- **Dr. Dagmar Niebur** was tenured and promoted to Associate Professor of Electrical and Computer Engineering on May 21, 2003.
- **Dr. Bahram Nabet** has been appointed as an Associate Dean for Special Projects in the College of Engineering. He will be in charge of developing international programs, leading and coordinating efforts to establish research collaboration at the graduate level, as well as educational collaboration at undergraduate levels.
- *Two affiliated faculty were appointed December 3, 2002:*

Spiros Mancoridis, Ph.D. Associate Professor of Computer Science, Director of Software Engineering for BS and MS Programs and Director of the Software Engineering Research Group (SERG)

Aydin Tozeren, Ph.D., Director of Bioinformatics, School of Biomedical Engineering, Science & Health Systems

- **Dr. Birsen Yazici** resigned from her position as Assistant Professor in the ECE Department at the end of AY03. She has accepted a tenure-track position as an Assistant Professor at Rensselaer Polytechnic Institute.

- **Dr. Stewart Personick** resigned from his position as E. Warren Colehower Chair Professor and the Director of Telecommunications and Information Networking Center at Drexel University for personal reasons. Dr. Personick has been a great asset to the ECE Department and Drexel University. He has been a member of the ECE faculty since September 1, 1998, and successfully led the Pegasus and ACIN projects, which were among the largest contracts received by Drexel University. Under Dr. Personick's leadership, the Telecommunications and Information Networking Center was established and built into a highly successful research lab that attracted major contracts and grants involving a large number of faculty and students.

Faculty Recruitment

- AY 2002-03 Recruitment Statistics:

Applications Received:	276
On-Campus Interviews:	9
Offers Made:	3
Offers Accepted:	2

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

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 a 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 MultiProtocol 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 (Milwaukee, Wisconsin) in May 1996 and a M.S.E.E. from The University of Texas at Austin in May 1999. He earned a Ph.D. in Electrical and Computer Engineering from the University of Texas at Austin in May 2003 and joined Drexel University in September 2003 as an Assistant Professor.

Dr. Weber's research interests focus on mathematical modeling of computer networks. His recent research projects have 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 lie in network economics and studying Internet topology.

From 1994-1996, Dr. Weber worked as an intern at the MacNeal-Schwendler Corporation. At MacNeal-Schwendler, he developed simulations of the company's finite-element software for electromagnetics. From 1996-1997, Dr. Weber worked as a research assistant for the National Law Center on Homelessness and Poverty in Washington, D.C., where he studied the impact of the 1996 Welfare to Work Act on the homeless population.

Dr. Weber was awarded a University of Texas Continuing Fellowship from 1999-2000, a University of Texas MCD Fellowship from 1997-1999 and a University of Texas College of Engineering Doctoral Fellowship from 1997-2001. He is a member of IEEE, Eta Kappa Nu, Tau Beta Pi, Sigma Chi and Pi Mu Epsilon.

- The AY 2003-04 faculty distributions in the ECE Department will be as follows:

Tenure Track	32
FT Auxiliary	2
Research	3
Adjunct	3
Affiliated	9

Staff Appointments

Ms. Stacey Caiazzo joined the Department as the new Graduate Programs Coordinator on June 4, 2003. Stacey graduated with a bachelor's degree in English/Communications from Cabrini College in 1998. As the Graduate Programs Coordinator, Stacey's

responsibilities will include maintaining the ECE website, submitting ECE's RA/TA paperwork for processing, as well as facilitating graduate student recruitment efforts and reviewing ECE graduate program admission applications.

ECE Advisory Council

- The biannual ECE Advisory Council Meeting was held on December 3, 2002. There were five Advisory Council members in attendance and numerous ECE faculty and representatives from Institutional Advancement. The Advisory Council members were highly enthusiastic and held extensive discussions on topics such as increasing domestic student enrollment and recruitment. They had many helpful suggestions. Their recommendations and input were greatly appreciated. Minutes from the December 3rd meeting are located on the ECE web page at:
<http://www.ece.drexel.edu/admin/advisoryminutes/dec2002.pdf>
- **Dr. Myron Holinko** resigned from the Advisory Council in the AY2002-03. Dr. Holinko was previously employed by the US Army CECOM, Research, Development and Engineering Center (RDEC), where he served as the Associate Director for Integration.

Facilities/Laboratories

In 2003, the decision that Commonwealth Hall will become part of the new research building was made, which caused the Department to minimize its laboratory and facility renovations. During the renovation of Commonwealth Hall, the University Administration is planning to move the ECE academic laboratories and administrative offices out of Commonwealth Hall.

Renovation of the Clean room - LeBow 334

The clean room is divided into several areas. The department determined that the clean room would be upgraded in stages. The first stage was to clean the internal room referred to as the yellow room. The old equipment was removed, a motorized room darkening shutter system was installed and the room was cleaned. A large optical table with a 5 watt constant light source laser was installed with an overhead instrument platform. The storage room and entry vestibule were also cleaned up and all the HEPA filters were replaced. Currently, there is a problem with the humidity in the room and Facilities Management has ordered a heating coil that should resolve the problem. The next stage is to clean the 'white room' and assign areas of work.

X-Terminal Lab – Commonwealth 404

The x-terminals were replaced with a computer and flat panel display because of the improvement in the speed of x-terminal software on Windows machines. This will allow the same activities in the room that require an x-terminal, but with improved speed and the broader usage that the computer provides.

Access Card Upgrade

The University switched to a new identification card system, which required the upgrade of the Department's existing system. The new system was phased in to allow the University's security department to have access. Drexel Security can now allow entry into controlled space in an emergency, while the department still controls access for daily operations.

Other Projects

- New furniture was purchased for four faculty offices
- New furniture was installed in two labs for new faculty
- Two RF 2GHz signal generators were purchased for the Communications Lab, room 209
- Renewed all software licenses including Mentor Graphics, MATLAB and OrCAD
- Purchased license for Synopsys, a design tool package

ECE Faculty Retreat

The ECE Faculty Retreat was held September 18, 2002 at SugarLoaf Conference Center. There were 35 participants at the retreat during the day and 40 at the reception and dinner with spouses and guests. Some of the main topics discussed were the construction of the new research building and its impact on the ECE Department, the Department's need to diversify its research and focus on new initiatives and interdisciplinary collaborations and Computer Engineering faculty recruitment.

“ECE Dialog” 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. 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 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 2002-03 were held on October 23, 2002, February 12, May 7 and July 29, 2003.

Other Departmental News

- **The ECEngineer** newsletter, published by **M. Shankar** and **Allison Steever**, was distributed in July 2003. The newsletter featured developments and notable achievements of the Electrical and Computer Engineering Department's faculty, alumni, staff and students. The newsletter is also located on the Department's web page at:
http://www.ece.drexel.edu/reports/newsletter_2003.pdf.
- **The International Microwave Symposium (IMS) 2003** was held June 8-13, 2003 at the Philadelphia Convention Center. There was a main conference, IMS, and two satellite conferences: Radio Frequency Integrated Circuits (RFIC) and Automatic RF Techniques Group (ARFTG). The total attendance was approximately 15,000, with close to 1,000 technical presentations, 38 workshops, panel sessions and a variety of technical and social activities. The exhibit had 800 booths.

IMS 2003 is run under the auspices of the IEEE Microwave Theory and Techniques Society (MTT-S), which is one the largest, oldest and most prestigious engineering societies.

Dr. Arye Rosen, Academy Professor of Biomedical Engineering and Electrical Engineering, was honored at a special session of the International Microwave Symposium on June 11, 2003, along with Drs. Kiyoy Tomiyasu and Martin Schneider. The significant impact of these outstanding individuals to microwave engineering through pioneering research efforts, illustrious scientific careers and sustained distinguished service to the IEEE and MTT-S were recognized at this session.

Drexel University was also honored at the Annual MTT-S Awards Banquet, held June 11th, for the ECE Department's contributions to IMS 2003 under the leadership of **Dr. Peter Herczfeld**. Dr. Richard Snyder, General Chair of IMS 2003, announced the establishment of the "Drexel University Educational Grant in Microwave Photonics." The grant was established through the IEEE Educational Fund and is in recognition of the services provided by the ECE Department and Drexel University to IMS'03. **Dr. and Mrs. Papadakis** were in attendance at the Awards Banquet and Dr. Papadakis was recognized and presented with a certificate of appreciation by Dr. Snyder.

The ECE Department played a major role in IMS 2003. The ECE faculty, students and alumni had a large presence and visibility in this preeminent conference in microwaves. The ECE Department also set-up a booth at the Conference Exhibits to display the research projects of our faculty and students in microwaves, and to provide information about Drexel University.

- The ECE Department hosted a **Blue and Gold Days Champagne Brunch** on Saturday May 3, 2003. The event was organized to give alumni a chance to reunite with faculty, advisors and classmates.

Last year, the Department welcomed its alumni for Drexel's Blue and Gold Days Gala Event, which was held May 4, 2002 in Behrakis Grand Hall. The reunion was a success, with a good number of ECE alumni in attendance. The Ceremony was preceded by a tour of the Department's state-of-the-art laboratory facilities, led by **Wayne Hill**.

At this year's event, there were 16 attendees. The event brought together alumni from across generations going back all the way to the Class of 1953.

- **Lloyd Greenwald**, Assistant Professor of Computer Science, received the 2003 Allen Rothwarf Teaching Award, named in honor of the deceased ECE professor.
- **President Papadakis and Provost Eaton** met with the ECE faculty on November 8, 2003 to review recent ECE activities. They received faculty feedback for the new Strategic Planning initiative.
- On December 23, 2002, Governor Mark Schweiker approved \$8 million in funding from Pennsylvania's Redevelopment Assistance Capital Program for the development of Drexel's new Bassone Engineering Research Center. The complex will consist of a new building designed by renowned architect I.M. Pei, which will be combined with the renovated Commonwealth Hall to provide students and faculty with 150,000 sq. ft. of state-of-the-art facilities. The original proposal submitted to Governor Tom Ridge seeking \$10M in renovation funds for Commonwealth Hall was prepared by the ECE faculty in May 1997.
- 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 has already secured the commitment of a number of ECE faculty members to make annual contributions in excess of \$1,000 toward the establishment of this endowed fund. Although the total 5-year pledges of these faculty members will ensure the establishment of the fund, the Department's aim is to grow the fund as rapidly as possible through other contributions such as alumni, industry and departmental contributions. Currently, the fund has reached approximately \$20,000.

ECE Social Events in AY 2002-2003

- New Graduate Student Welcoming Reception/Pizza Party (*September 25, 2002*)
- The Annual ECE International Holiday Party (*December 19, 2003*)
- ECE Department Annual Holiday Dinner (*December 15, 2002 at D'Ignazio's Townehouse*)
- 2003 Blue and Gold Days ECE Champagne Brunch (*May 3, 2003 at the Faculty Club*)
- Senior Design Pizza Party (*June 2, 2003*)
- Eta Kappa Nu Annual Faculty Roast (*June 6, 2003 at Cavanaugh's*)
- End of the Academic Year Faculty Meeting and Luncheon (*June 24, 2003*)
- Doctoral Student Degree Completion Pizza Party (*June 5, 2003*)
- ECE Spring Party at the Bilgutays residence (*June 8, 2003*)

Challenges and Goals for the ECE Department in AY 2003-2004

Hiring high quality and nationally competitive faculty in areas of great demand, such as computer engineering, nanotechnology, MEMS and other newly emerging fields continues to be the top priority for the ECE Department. 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 in 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 and 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.
- This fall we are experiencing a 30% decline in the Computer Engineering freshman, while the Electrical Engineering freshman figures remain constant. Our focus this year will be to reverse this trend and improve the freshman Computer Engineering class size in fall 2004. 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. We are happy to note that for the second year in a row the Department continues to experience an increase in the number of new graduate students entering in the fall. We initiated the graduate curriculum restructuring two years ago and plan to complete the process of our graduate programs during this academic year. The main focus is to develop 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 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.
- Renovation of Commonwealth Hall and the construction of the new Bassone Research Enterprise Building is a positive development for the University. However, this initiative must be coupled with the ECE Department being provided with modern, state-of-the-art facilities to maintain and strengthen the Department's significant contributions to the educational and research enterprises at Drexel. We will work closely with the administration to achieve these goals.
- 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.

Appendix A: ECE Department FY July 2002-June 2003 Research Awards

Principal Investigator	Sponsor	Project Title	Amount
Dandekar, Kapil	Harry Stern Foundation	Ad-Hoc Capability over Link-16	9,885
Fontecchio, Adam	NASA	NASA Grad. Student Res. Prog. For M. Ermold	24,000
Fontecchio, Adam	NIST	2003 NIST Summer Graduate Fellowship	6,000
Herczfeld, Peter	Office of Naval Research	Hybrid Fiber Optic/Wireless System for High Capacity Military Communication	909,353
Hrebien, Leonid	Titan Corporation	Development of a software Dynamic EmG Analyzer	25,000
Kam, Moshe	National Institute of Justice	Proficiency Testing and Procedure Validation for Forensic Document Examiners	296,226
Meystel, Alexander	Kinetics Chempure Systems	Software Related Services	24,000
Meystel, Alexander	Battlespace, Inc.	Research in Support of Advanced NICCI Concepts	17,500
Miu, Karen	Lindback Foundation	Electric Service Restoration of Critical Loads in Power Dist. Systems	12,700
Personick, Stewart	NJ Commission on Science and Technology	NJ Technology Incubator Program	75,000
Personick, Stewart	US Army Communications	ACIN (Phase 3)	10,000,000
Personick, Stewart	US Army Communications	ACIN (Phase 2)	28,638
Petropulu, Athina	Villanova University	Curriculum Development in Systems for Smart Communications	71,890
Petropulu, Athina	ONR	Target Tracking and Sensor Fusion	226,334
Rosen, Warren	GEMS, Inc.	Engineering Support for Development of a High Speed Optical Link for Advanced Avionic	50,000
Sethu, Harish	NSF CAREER	Novel Wormhole Switch Arch. For High Performance with Fairness	11,250
ECE SUB-TOTAL			<u>\$11,975,217</u>

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

PI: Lloyd Greenwald

Co-PIs: Bill Regli and **Harish Sethu**

Title: "Quality-of-Service Architectures in Ad Hoc Networks for Battlespace Awareness"

Sponsor: Lockheed Martin Corporation

Amount: \$50,000

Duration: 3/03-12/03

PI: Paul Oh (MEM)

Co-PI: Ruifeng Zhang

Title: "A Model Bioterrorism Civilian Medical Response: Regional Initiatives, Readiness & Response Training and Communications Infrastructure"

Sponsor: Department of Defense, Telemedicine Advanced Technology Research Council

Amount: \$169,006

Duration: 1/1/2003-12/31/2003

<i>Electrical & Computer Engineering Total:</i>	<i>\$12,194,223</i>
<i>College of Engineering Total:</i>	<i>\$28,954,247</i>
<i>Drexel University Total:</i>	<i>\$100,917,167</i>

**Appendix B: ECE Department FY 2002-2003 (July-June)
Research Expenditures**

<i>Electrical & Computer Engineering Total:</i>	<i>\$13,449,656</i>
<i>College of Engineering Total:</i>	<i>\$25,369,782</i>
<i>Drexel University Total:</i>	<i>\$84,562,199</i>

*****Includes \$270,807 in joint grant expenditures with PIs from units outside ECE.**

Appendix C: ECE Curricular/Research Groups
AY 2002-2003

Telecommunications & Networking

<u>Core Members</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Afshin Daryoush	Peter Herczfeld	Stewart Personick
Bruce Eisenstein	Ryszard Lec	
Stan Kesler	Bahram Nabet	
Stewart Personick	Prawat Nagvajara	
Mohana Shankar	Athina Petropulu	
Ruifeng Zhang	Harish Sethu	
Kapil Dandekar	Birsen Yazici	
	Nihat Bilgutay	
	Allon Guez	

Computer Engineering

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Jeremy Johnson	Bill Freedman	Harish Sethu
Constantine Katsinis	Stewart Personick	
Alex Meystel	Ruifeng Zhang	
Prawat Nagvajara		
Warren Rosen		
Harish Sethu		
Lazar Trachtenberg		
S. Basavaiah		
Karkal Prabhu		

Controls, Robotics and Intelligent Systems

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

Image and Signal Processing and Interpretation

<u>Core Member</u>	<u>Affiliated Members</u>	<u>Coordinator</u>
Nihat Bilgutay	Moshe Kam	Fernand Cohen
Fernand Cohen	Stan Kesler	
Leon Hrebien	Ryszard Lec	
Banu Onaral	Peter Lewin	
Athina Petropulu	Mohana Shankar	

Oleh Tretiak
Birsen Yazici
Aspa Zerva

Lazar Trachtenberg
Ruifeng Zhang
Bruce Eisenstein
Eli Fromm

Electrophysics

Core Member

Gary Friedman
Ed Gerber
Peter Herczfeld
Dov Jaron
Ryszard Lec
Peter Lewin
Bahram Nabet
Kambiz Pourrezaei
Kevin Scoles
Adam Fontecchio
Timothy Kurzweg
Arye Rosen

Affiliated Members

Karen Moxon
Stewart Personick
Warren Rosen
S. Basavaiah
Kapil Dandekar
Afshin Daryoush
Eli Fromm

Coordinator

Gary Friedman

Power Engineering

Core Member

Karen Miu
Dagmar Niebur
Chika Nwankpa

Affiliated Member

Kevin Scoles

Coordinator

Chika Nwankpa

**Appendix D: Electrical and Computer Engineering Department Committees
2002-2003**

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
Alex Meystel, Controls, Robotics and Intelligent Systems
Bahram Nabet, Electrophysics
Dagmar Niebur, Power Engineering
Stewart Personick, Telecommunications and Networking
Harish Sethu, Computer Engineering
Birsen Yazici, Image/Signal Processing and Interpretation
Eric Gallo, Graduate Student Representative

ECE Seminar Committee:

Athina Petropulu, Chair
Nihat Bilgutay (Ex Officio)
Gary Friedman
Allon Guez
Karen Miu
Harish Sethu
Birsen Yazici
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
Adam O'Donnell, TA

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 Undergraduate Track Advisors Committee:

Paul Kalata, Controls/Robotics
Constantine Katsinis, Computer Engineering
Kapil Dandekar, Telecommunications
Prawat Nagvajara, Computer Engineering
Dagmar Niebur, Power Engineering
Kevin Scoles, Electronics

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
Constantine Katsinis, Computer Engineering
Chika Nwankpa, Power Engineering
Athina Petropulu, 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.*

Named Professor Nominating Committee:

Bruce Eisenstein, Chair

Nihat Bilgutay

Peter Herczfeld

Stewart Personick

Oleh Tretiak

Appendix E: Curricular/Research Group Representation on ECE Standing Committees

Computer Engineering:

Oleh Tretiak, Undergraduate Affairs Committee
Constantine Katsinis, Faculty Recruitment Committee
Alex Meystel, Planning & Development Committee
Harish Sethu, Graduate Affairs Committee and Faculty Recruitment Committee
Lazar Trachtenberg, Promotion & Recognition 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, Promotion & Recognition Committee and Graduate Affairs Committee
Leon Hrebien, Undergraduate Affairs Committee
Athina Petropulu, Faculty Recruitment Committee
Oleh Tretiak, Planning & Development Committee
Birsen Yazici, Graduate Affairs Committee

Power Engineering:

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

Telecommunications & Networking:

Athina Petropulu, Faculty Recruitment Committee
Afshin Daryoush, Promotion & Recognition Committee
Bruce Eisenstein, Planning & Development Committee
Stan Kesler, Undergraduate Affairs Committee
Stewart Personick, Graduate Affairs Committee

Graduate Group Coordinators:

Harish Sethu, Computer Engineering
Chika Nwankpa, Power Engineering

Gary Friedman, Electrophysics
Stewart Personick, Telecommunications & Networking
Fernand Cohen, Image and Signal Processing
Allon Guez, Controls/Robotics/Systems
Kapil Dandekar, Telecommunications and Networking

Undergraduate Track Coordinators:

Paul Kalata, Controls and Robotics
Prawat Nagvajara, Computers
Chika Nwankpa, Power and Energy
Kevin Scoles, Electronics
Mohana Shankar, Telecommunications/Signal Processing
Kapil Dandekar, Telecommunications and Networking

Appendix F: CoE Honors Day 2003 Award Recipients

The COE Honors Day Ceremony was held on Wednesday, February 19, 2003 in the Main Auditorium. The award recipients were:

Dr. Bruce Eisenstein, Robert Quinn Medal for Outstanding Leadership

Dr. Peter Herczfeld, Research Accomplishment Award

Mr. Wayne Hill, Technical Staff Accomplishment

Dr. Mohana Shankar, Service Accomplishment

Graduate Student Research Award: Salil Kanhere

Undergraduate Student Research Award: Gustave W. Anderson

Boeing Engineering Award: Saturnino Garcia

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

I. Ray Dunlap Scholarship: Joseph B. Dorn and Saturnino Garcia

Elmer W. Griscom Scholarship: Steven D. Essinger and Truong A Truong

Arnold H. Kaplan Scholarship: Nevzat Cubukcu, Timothy J. Furman, Rajeev Iyer and Satyajit Reddy

William F. Mitchell Special Opportunity Endowed Scholarship Fund: Charyee Mai

Harry E. Muchnic Scholarship: Steven J. Crowell, Jong H. Hyun, Aby John, Manikantan Parameswaran, Matthew J. Sternberg and Savannah L. Trump

NACME Engineering Vanguard Program: Lloyd T. Emelle, Jorge L. Garcia and Corrin Yates

Milton Rosenberg Scholarship: Wang-Ching Lam, Glenn T. Lovercheck, Divyang K. Masrani, Kunal A. Shah and Ryan Scott Spring

Herman Schaevitz Memorial Scholarship: Justin J. Caruso, Prajwal S. Juvvadi, Yonghong Lee and Eric C. Savage

William T. Schleyer Endowed Scholarship Fund: Dhruv Ramesh

John Raymond Vollmar Endowed Scholarship Fund: Patrick J. Mathias

Alvin W. Wene Engineering Scholarship: Edward M. Boris and Iman Lordgooei

Dean's Fellowship: Eric M. Gallo, Joshua J. Kodroff, Adam O'Donnell and David Yoo

George Hill, Jr. Fellowship: Yunkai Zhou

National Defense Science and Engineering Graduate (NDSEG) Fellowships: Adam O'Donnell and Benjamin B. Yellen

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

Kling-Lindquist Engineering Scholarship: Rohan D. Wagle and Asgodom Woldu

Robert Fischl Annual Prize in Electric Power Engineering Studies: Wan Jie

Lester Kraus Award: Yoba Amoah

Thomas W. Moore Endowed Fund: Manoj J. Chacko, Michal Cohen, Matthew D. Garfield, Anthony P. Madonna

Robert G. Quinn Scholarship: William E. Norman

Arthur W. and Blanche Garroway Vanaman Scholarship: Ankan Basak, Jeremy J. Boecker, Francis X. Prihoda, Harshal A. Shah and Edward M. Woertz

Appendix G: Past ECE Department Award and Recognition Ceremony Recipients

Robert Quinn Outstanding Undergraduate Student Award Recipient

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

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

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

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

Staff Recognition Award

2001-2002 Kathy Bryant
2001-2002 Wayne Hill