



Nance Dicciani, pictured with Dean Barry C. Johnson, was presented an honorary medallion and award for her significant achievement in the field of engineering.

COLLEGE OF ENGINEERING CELEBRATES 100TH ANNIVERSARY GALA

The College of Engineering marked its 100th Anniversary with an Alumni/Corporate Gala held at the Franklin Institute Science Museum on December 3, 2005. The gala showcased the College's accomplishments over the past 100 years. It also provided a formal opportunity to recognize the contributions of key individuals and increase the College's visibility to corporations and the community at-large. The event was attended by approximately 350 guests, including major donors, university dignitaries and members of the College's Advisory Council. Alumni, students and representatives of approximately 30 engineering firms also attended. Air Products and Chemicals, Inc. is the Benefactor of the 100th Anniversary. The gala was also sponsored by nearly 20 corporate partners (*see sidebar*).

B. Gentry Lee, Chief Engineer for the Planetary Flight Systems Directorate, at the Jet Propulsion Laboratory in Pasadena, CA served as the gala's keynote speaker. Lee is responsible for engineering planetary missions, including the Mars Exploration Rovers, and was instrumental in mankind's first successful landings on another planet. As Chief Engineer for the Galileo Project, Lee partnered with Carl Sagan in the creation, design, development and implementation of Cosmos, a science documentary series from 1976-1981. Lee's keynote address highlighted engineering's vast contributions to society over the past 100 years and the innumerable opportunities for future advancements.

The College of Engineering presented an honorary medallion and award to 10 key alumni for their significant achievements in the field of engineering. Recipients included Andrew M. Allen '64, James R. Birlle '58, Gerald S. J. Cassidy '63, Nance K. Dicciani '69, Donald P. Fusilli '73, John L. Hennessy '73, John P. Jones '72, Edward H. Reese '59, and John M. Robins '70.

Dr. Barry Johnson, Dean, served as the gala's master of ceremonies. Dr. Johnson emphasized the College's continued mission to educate young people to solve problems, embrace emerging technologies

and bring a humanistic approach to the field of engineering.

"Engineering, by its very nature, is about dealing with continuous change, and we strive to develop people who will be well equipped to solve new problems as they arise," Johnson said. "One thing that hasn't changed is our commitment to educate the whole person, to bring communication skills to the curriculum, and to instill an ethical perspective and sense of community that will impact how today's graduates and those who graduate 25 or 50 years from now will bring a humanistic perspective to their work."

Johnson also spoke on the significance of the 100th Anniversary theme, "Celebrating Our Past, Re-engineering The Future."

"In celebrating our past, we recognize many people who have contributed to the College over the years. We celebrate the success of our alumni, many of whom are now leaders in the corporate, government and academic arenas..." Johnson said. "In re-engineering the future, we are constantly finding ways to improve the educational process for engineers. Since 95 percent of our graduates will work in the corporate world, we need to understand business needs today and what the needs will be 20 years from now, so that we can deliver the kinds of individuals needed going forward."

During the ceremony, Rev. Edmund J. Dobbin, O.S.A. offered remarks on the Augustinian tradition. Speakers at the gala also included Joan Chrestay, Associate Dean for External Relations, and Thomas Portland, Vice-Chairman of Global Edu-Tech Management Group and President of Executive Development Associates Consulting Division. Portland retired as Vice President of Air Products and Chemicals and currently chairs the College of Engineering's Advisory Council. Dr. Helen Lafferty, Vice President, gave the invocation and John Karpowicz '78, President of the Engineering Alumni Society, gave the benediction. The event also featured a commemorative 100th Anniversary video, dinner and dancing.

The College of Engineering launched its 100th Anniversary celebration with a well-attended Student Picnic on September 30th. Donations from The Vanguard Group and nearly 25 campus organizations, local businesses and

friends of the College helped to make the celebration possible. Engineering students were notified early in the fall semester to visit the engineering office and pick up a specially designed 100th Anniversary T-shirt to wear as their ticket to the event.

As a continuation of its 100th Anniversary celebration, the College will host a Distinguished Speaker Series throughout the year. The following prominent alumni are scheduled. John P. Jones '72, President, Chairman and CEO, Air Products and Chemicals on January 18, 2006; Nance Dicciani '69, President and CEO, Specialty Materials, Honeywell International Inc. on February 24, 2006; John McCoy, Emeritus Professor of Engineering at The Catholic University of America; Andrew Allen, '77, Vice President and Program Manager, Fixed Wing Military Aircraft, Honeywell International Inc., and former astronaut and retired Lieutenant Colonel, USMC. Additional biographical information on the speakers as well as the time and location of the lectures are posted on the College of Engineering's website. The speaker series is open to students, alumni, corporate partners, and the Villanova community. Reservations are required by contacting: gayle.doyle@villanova.edu or 610.519.5944.

The 100th Anniversary celebration will culminate with an on-campus community event including a special Mass at the St. Thomas of Villanova Church on April 29, 2006. A dinner for the College of Engineering faculty, staff and friends will follow.

100th Anniversary Sponsors

The College of Engineering gratefully acknowledges the following businesses and friends for their sponsorship of the College of Engineering's 100th Anniversary events.

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Associate Dean Joan Chrestay with John Paul Jones as he receives his award from Dr. C. Michael Kelly, Chairman of the Chemical Engineering Department.

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WELCOME TO DR. STEPHEN JONES, ASSOCIATE DEAN OF ENGINEERING FOR STUDENT AND STRATEGIC PROGRAMS

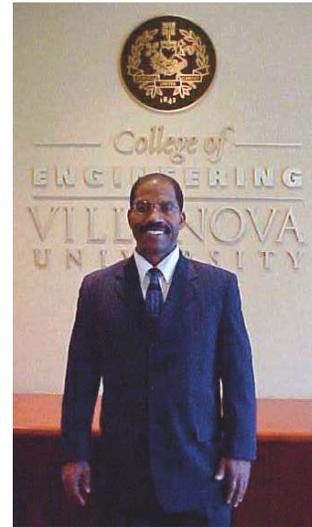
The College of Engineering welcomes Dr. Stephen Jones to the position of Associate Dean of Engineering for Student and Strategic Programs. Dr. Jones is an outstanding educator who has spent his career helping economically disadvantaged students to succeed in college. Dr. Jones received his Bachelors Degree in Community Psychology from Widener University, Masters in Education from Howard University, Masters in Business Administration from Philadelphia University, and a Doctorate in Education from Widener University. He has been instrumental in helping thousands of students to realize their dream to earn a degree.

For twenty years, Dr. Jones has delivered presentations on numerous topics including how to study, leadership, effective communication, and innovative management practices. He is the author of a book titled "Seven Secrets of How to Study." The book provides an easy understanding of the seven pillars that are essential to learning effective study techniques. After twenty years of working in higher education, he decided to create a tool to help students to achieve their goal to graduate. Working with students has enabled Dr. Jones to have a complete understanding of the challenges they are facing.

For thirteen years Dr. Jones worked at Drexel University as Director of the SUCCESS/ACT101 program. He has received numerous awards for his dedication to students. Some of his awards include Distinguished Toast Master, Toastmasters District Award Winner, National Society of Black Engineers Award and Black Engineer of the Year Award.

The Drexel University chapter of the National Society of Black Engineers recently named an award after him to acknowledge his efforts. The award is titled the Dr. Stephen Jones Award for Academic Excellence. It is presented to a student who has demonstrated academic excellence throughout his/her enrollment.

Dr. Stephen Jones has dedicated his life to diminishing the academic gap that prevents students from achieving their dreams. Within a span of twenty years he has used his understanding of students to help them to reach their full potential. He has reshaped the landscape for students whose families lack the financial resources for their students to remain in college. He has broken the barriers that have limited the intellectual capacity of America's future workforce.



Dr. Stephen Jones

DR. ROBERT G. TRAVER APPOINTED TO NEW ORLEANS HURRICANE PROTECTION SYSTEM EXTERNAL REVIEW PANEL

Reprinted from ASCE press release.

The American Society of Civil Engineers (ASCE) has announced that Robert G. Traver, Ph.D., P.E., D.WRE, associate professor of civil and environmental engineering at Villanova University in Villanova, Pa., will serve as a member of an external review panel commissioned as part of the federal effort to provide credible answers to the fundamental questions concerning the performance of the hurricane protection system in Orleans during Hurricane Katrina. Along with the ASCE external review panel, the federal response includes an Interagency Performance Evaluation Task Force, organized by the U.S. Army Corps of Engineers, and a National Research Council independent review panel, convened at the direction of the Secretary of Defense Donald Rumsfeld.

Traver, a retired Army Reserves Lt. Col. and Operation Desert Storm veteran, has been a member of the Water Resources and Environmental Engineering Program at Villanova since 1988. His teaching responsibilities include courses in hydrology, hydraulics, stormwater management and all facets of water resources. Traver has conducted research on modeling of stream hydraulics, urban hydrology, water quality and measures to mitigate stormwater effects of urbanization. To advance research in storm water management, Dr. Traver founded the Villanova Urban Stormwater Partnership, where he currently serves as director.

Traver was appointed by the Commonwealth to the oversight committee for Pennsylvania's "new" BMP Handbook, and has served five years as chair of the Pennsylvania Stormwater Management Symposium held at Villanova. He currently serves on the U.S. Environmental Protection Agency's National Monitoring Program and as a member of the American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute's Water Resource Planning Council.

He is a diplomat of the American Academy of Water Resources Engineers and was named the Water Resources Engineer of the Year by the Philadelphia Section of ASCE. Traver received a bachelor's in civil engineering from the Virginia Military Institute, a master's degree in civil engineering for Villanova University and doctorate degree in civil engineering from Pennsylvania State University.



Robert G. Traver, Ph.D.

CONTI GROUP SIGNS COMPREHENSIVE PROPOSAL WITH COLLEGE OF ENGINEERING

The Conti Group offered an undergraduate scholarship and a graduate research fellowship in renewable energy studies in the College of Engineering this year. The company recently announced plans to expand its heavy construction business company into the renewable energy field. The College proposed working with the corporate partner on research key to advancing the field and to increase the number of undergraduate and graduate students prepared to work in renewable energy.

The new student opportunities were part of a comprehensive proposal established between The Conti Group and the College of Engineering, including Dean Barry Johnson; Dr. Keith Moo-Young, Associate Dean for Research and Graduate Studies; Joan Chrestay, Associate Dean for External Relations; and Dr.

Pritpal Singh, Chair, Department of Electrical and Computer Engineering. The Conti Group is currently determining the junior-year student recipient for the \$7,000 scholarship and paid summer internship, and the \$25,000 award over two years to a graduate fellow.

The collaborative partnership will further research and development within the College and the company.

The Conti Group also offered an employee training workshop in the area of photovoltaics through the College of Engineering. The one-week workshop, designed for technicians and engineers, was organized in conjunction with professional solar installers and offered at the company's headquarters. Participants in the workshop earned three Villanova University continuing education credits, a certification of completion; and they are eligible to use the workshop as a stepping stone for formal certification such as the North American Board of Certified Energy Practitioners (NABCEP).

The College of Engineering faculty also provided professional consultation

services on photovoltaics. The services included technical design assistance and intelligence reporting on solar modules and balance of system components. In addition, professional consultation was offered on solar electric systems.

An on-going corporate partner of the College, The Conti Group offers an annual undergraduate scholarship and internship program to Civil and Environmental Engineering and Mechanical Engineering students. The company actively recruits on campus at career fairs and through job postings on the Office of Career Services' website. **Kurt Conti '84**, President and CEO, serves as a member of the College of Engineering Advisory Council.

THE GERALD A. WHITE FUND FOR BIOTECHNOLOGY RESEARCH ESTABLISHED IN COLLEGE

Gerald White '57 recently established The Gerald A. White Fund for Biotechnology Research in the College of Engineering. In honor of his \$375,000 gift contribution, the Biotechnology Research Laboratory will be named in his honor. The lab is located in the Chemical Engineering Building. The University will install a plaque outside the laboratory, which will illustrate Mr. White's generous commitment to the University in perpetuity.

The initial principal of the fund, representing \$125,000, has been used to provide immediate resources to upgrade and modify the existing lab. The balance of the commitment, representing \$250,000, will establish an endowment in Mr. White's name to support the equipment and research program needs within the lab.



Students enjoyed the fall weather, the picnic fare and the break from studies at the 100th

CALAPRISTI SCHOLARSHIP AWARD WINNER ANNOUNCED

Michael Martignetti, a junior Civil and Environmental Engineering student, was awarded the first annual Anthony F. Calapristi Endowed University Scholarship in Engineering, made possible through a contribution by the estate of Anthony Calapristi '40. The \$200,000 endowed scholarship provides a \$10,000 student scholarship per year. Drs. John Molyneaux, Associate Dean for Undergraduate Studies, and Ed Glynn, Assistant Professor of Civil and Environmental Engineering, nominated Martignetti based on criteria for the scholarship including academic achievement and financial need.

Mr. Frank Calapristi and Mrs. Mary Berardi, siblings of the donor, along with their spouses Loretta Calapristi and Al Berardi, held a congratulatory luncheon in October to honor

Martignetti's achievement. Joan Chrestay, Associate Dean for External Relations and Melanie (Terburg) Brady, Assistant Director for External Relations, also attended.

The Calapristis and Berardis were escorted on a tour of the Center for Engineering Education and Research (CEER) to see the usage of additional contributions made by Anthony Calapristi. Dr. Randy Weinstein, Associate Professor of Chemical Engineering, gave a demonstration of the ThermoCAM S40 Infrared Camera, an equipment purchase in the Mechanical Engineering Department made possible through the Calapristi donation. Dr. David Dinehart, Associate Professor of Civil and Environmental Engineering, recognized Mr. Calapristi's gift bequest to the Structural Engineering and Teaching Laboratory. The gift was acknowledged posthumously at the grand opening of the laboratory in June 2005.

INDEPENDENCE CHAPTER, ASSOCIATION OF OLD CROWS SCHOLARSHIP ANNOUNCES SCHOLARSHIP WINNER

The Association of Old Crows (AOC), an international professional organization involved in electronic defense, recently announced **George Tillinghast** as the recipient of its annual scholarship. Dr. John Molyneaux, Associate Dean for Undergraduate Studies nominated Tillinghast, a junior Mechanical Engineering student. Eligibility criteria for the \$1,000 scholarship included scholastic ability, character and dependability.

The AOC has more than 20,000 members in the field of electronic defense. One of the most important functions of this organization and its local Independence Chapter is the scholarship program that financially assists students in engineering, mathematics and science. The AOC has had a long association with the College of Engineering.



Lea Pineda

MICHAEL BAKER CORP. ANNOUNCES SCHOLARSHIP WINNER, CONTINUES SUPPORT OF CIVIL AND ENVIRONMENTAL ENGINEERING

The Michael Baker Corporation and the College of Engineering held a luncheon in November to honor **Lea Pineda**, a junior Civil Engineering student and this year's recipient of the annual Scholarship for Diversity in Engineering. The scholarship is provided through a partnership between the company and the Association of Independent Colleges and Universities (AICUP).

Established three years ago, the \$1,000 scholarship is "designed to promote the engineering profession to individuals from groups historically under-represented in engineering." The awardee receives both scholarship aid applied toward tuition costs and a company mentor to help transition into the workforce. Eligibility criteria included a minimum GPA of 3.0, full-time enrollment as a junior in civil and environmental engineering, and application review by a corporate selection committee.

Michael Baker Corporation also presented Dr. Ronald Chadderton, Chair, Department of Civil and Environmental Engineering, with a \$10,000 check, the second installment of a \$50,000 contribution to support students, including summer research stipends. The company attends the College's Career Fair and posts employment opportunities through the Office of Career Services.

Representatives from the College of Engineering, including Dean Barry Johnson, Joan Chrestay, Associate Dean for External Relations, and Melanie (Terburg) Brady, Assistant Director for External Relations, attended the event. Representatives from the Michael Baker Corporation, including **Donald Fusilli '73**, President, also attended the luncheon. Mr. Fusilli serves on the College of Engineering Advisory Council. The Michael Baker Corporation is a leading international engineering and energy management firm located in Moon Township, PA.

CONTI ENTERPRISES AWARDS UNDERGRADUATE SCHOLARSHIP AND INTERNSHIP

Conti Enterprises, Inc. selected **Kevin Martin** and **Michael Newman**, juniors in Civil and Environmental Engineering for its third annual scholarship and internship opportunity.

The Conti Enterprises scholarship program provides two \$7,000 scholarships and paid summer internships to qualifying Civil and Environmental Engineering and Mechanical Engineering students for the 2005-2006 academic year. The student recipients were nominated by the College of Engineering through a competitive process including a GPA of 3.0, a letter of applicable credentials, and resume. The review process culminated in an on-campus personal interview with representatives of Conti Enterprises.

Kurt Conti '84, President and CEO, serves as a member of the Dean's Advisory Council. Conti Enterprises is a heavy construction firm active in the New York, New Jersey and Connecticut areas. Headquartered in New Jersey, the company has provided construction services since 1906, in broad categories such as remediation, demolition, transportation infrastructure, marine, rail, power and renewable energy.

CENTER FOR ADVANCED COMMUNICATIONS (CAC)

THREE NEW CAC RESEARCH LABS

In Fall 2005, the Director of the Center for Advanced Communications (CAC), **Dr. Moeness Amin**, announced the establishment of three new Research Labs under the auspices of the CAC. These state-of-the-art labs, listed below, were established from external funds, and each has its own Director and is maintained from revenues generated from research contracts and grants. The three labs add to and closely follow the successful model of the already existing CAC Antenna Research Lab, which is directed by **Dr. Ahmad Hoorfar**.

Detailed information on the labs and their capabilities can be found on the CAC website www.engineering.villanova.edu/research/cac/

RADAR IMAGING LAB

The Radar Imaging Lab (RIL) was established in January 2005 by a grant from the Defense Advanced Research Projects Agency (DARPA) to the CAC. The main objective of this well equipped \$400,000 lab, directed by the CAC Research Professor, **Dr. Fauzia Ahmad**, is to support research, analysis, and development efforts related to radar imaging. The RIL offers the capabilities for examining and providing proof-of-concept of existing and newly-devised imaging techniques using real data. The goal is to create a state-of-the-art indoor radar imaging facility that is unique in the Delaware Valley. The RIL is equipped with a powerful two-dimensional RF scanning system that allows large aperture, large bandwidth imaging of stationary, rotating, and moving objects behind walls. The lab is located in the Center for Engineering Education and Research, CEER 003.

The RIL has had collaborations with U.S. and foreign government agencies (DARPA, AFRL (Wright-Patterson AFB), NAVSEA (Philadelphia), Defense Research and Development (Canada)), academia (University of Pennsylvania, Michigan State University, and University of Wollongong - Australia), and industry (BAE Systems, and Wyle Labs). The lab is currently supporting research on Through-the-Wall Microwave Imaging and indoor target localizations. The facility has also been used for conducting tests related to RFID design and technology.

RADIO FREQUENCY IDENTIFICATION LAB

The Radio Frequency Identification Lab (RFID Lab) was established in the summer 2005 by an initial seed grant that the Ben Franklin Technology Partners (BFTP) made to the Center for Advanced Communications. The objective of this State funded lab, directed by the CAC Research Professor, **Dr. Yimin Zhang**, is to become a leading provider of RFID research in the region and promote collaboration and partnership with RFID manufacturing industries. The lab provides capabilities for the development of new RFID technologies and prototype designs. It hosts testing facilities for RFID products, and supports the evaluation of RFID tag and RFID-assisted tagged localization methods, collision avoidance techniques,

and signal propagation characteristics. The lab is housed in the Center for Engineering Education and Research, CEER 305.

The RFID Lab is involved in innovative antenna design for RF tags and algorithm development, for enhanced RF-tag reader characteristics and performance. These areas of technology will lead to effective and battery-efficient tags, improved tag-reading capabilities from near and far distances and in rich multipath, clutter, and scattering environments. Current sponsors of the RFID Lab include BFTP and VerdaSee Solutions, Inc.

WIRELESS COMMUNICATIONS AND POSITIONING LAB

The Wireless Communications and Positioning Lab (WCPL) was established by an initial \$250,000 grant from the Department of Defense (DOD) made to the CAC. The WCPL, directed by **Professor Moeness Amin**, is housed in the Center for Engineering Education and Research, CEER 305. The objective of this DOD funded lab is to provide the measurement and data collection capabilities combined with analyses and signal syntheses tools needed for the CAC to stay on the top of cellular telephony, wireless connectivity, and GPS technologies. The goal is to create a realistic wireless communications environment by providing remote, multi-point signal transmission of various formats such as voice, video, and data. The lab also allows testing of various techniques for wireless localization and geolocation, using single and multiple-antenna receivers.

The WCPL handles several projects related to seamless non-line-of sight communications for urban warfare, high-rate multiuser cooperative diversity systems, smart digital video, applications of smart antennas to rotorcrafts, array processing for interference suppression in GPS receivers, space-time coding for wireless communications, and indoor wireless channel modeling and equalization. Among the sponsors of the projects are DARPA, ONR, AFOSR, AFRL, NSF, and Ben Franklin Technologies Partners.

CAC AWARDS/ GRANTS ~ totaling \$2,021,708

THE DARPA/CTC CONTRACT ~ \$1,092,234

The CAC has received \$1,092,234 from Concurrent Technologies Corporation (CTC) to continue working on the DARPA funded project, *Through-the-Wall Radar Imaging*. On this project, the CAC has established collaborative research, though subcontract agreements, with the University of Pennsylvania, Wyle Labs, BAE Systems, and NAVSEA. The DARPA project is directed by **Dr. Moeness Amin** and involves **Dr. Ahmad Hoorfar**, as a CO-PI, one Research Professor, **Dr. Fauzia Ahmad**, two postdoctoral research fellows and four graduate students.

NSWCCD/ONR CONTRACT ~ \$450,000

The CAC has received \$450,000 from NSWCCD/ONR to work on research related to Future Naval Capabilities in the areas of Antennas, Communications, Geolocation, and Power

Management. The overall CAC efforts under the NSWCCD/ONR contract are headed by **Dr. Ahmad Hoorfar**. The projects and their respective Principal Investigators are:

Interference Suppression in GPS Receivers, **Dr. Moeness Amin**

Novel Lo-Profile Antenna and Metamaterial High Impedance Surfaces, **Dr. Ahmad Hoorfar**

Unmanned Surface Vehicle Power System Design and Modeling, **Dr. Pritpal Singh**

Multi-Sensor Wireless Networks for Unmanned Surface Vehicles, **Dr. Yimin Zhang**

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH CONTRACT ~ \$100,000

The Center for Advanced Communications and Adaptive Digital Technologies, Inc. were awarded in August 2005 a one year, \$100,000 Phase One Small Business Technology Transfer (STTR) contract by the U.S. Air Force Office of Scientific Research (AFOSR) to develop and apply novel approaches to two cutting edge technologies, Multiple Input Multiple Output (MIMO) systems using Space-Time Coding (STC), with the goal of achieving low bandwidth, and high reliability communication links in hostile urban terrain environments. The objective of this program with the Air Force, *Seamless Non-Line-Of-Sight Communications for Urban Warfare*, is to address the interference caused by buildings and to replace unreliable, low data rate communications with secure, high data rate non-line-of-sight communications.

Dr. Moeness Amin is the Principal Investigator on the AFOSR project. **Dr. Yimin Zhang**, a CAC Research Associate Professor, and **Dr. Genyuan Wang**, a CAC Postdoctoral Fellow, are both key participants and bring valuable expertise needed to achieve the project objectives.

OFFICE OF NAVAL RESEARCH GRANT ~ \$262,394

Drs. Amy Fleischer, ME, and Randy Weinstein, ChE, were awarded in August 2005 a three year \$262,394 grant from the Office of Naval Research on the topic *An Investigation into the Application of Nano-Enhanced Phase Change Materials for Transient Thermal Management of Naval Electronics*. The objective of this program is to develop passive, modular methods to control operating temperature in high power electronics.

ADDITIONAL GRANTS/AWARDS

Dr. Moeness Amin, CAC, ECE, received further funding from the Office of Naval Research in the amount of \$60,000 for conducting research on *Classification and Discrimination of Sources with Time-Varying Frequency and Spatial Spectra*.

Dr. Amy Fleischer, ME, was awarded in October 2005 a one year \$36,500 grant from the Pennsylvania Infrastructure Technology Alliance (PITA) on the topic *Comparative Evaluation of a Carbon Fiber Heat Sink and Graphitic Foam in Boiling Heat Transfer*. The objective of this work is to compare the heat transfer effectiveness of a carbon fiber heat sink to foamed carbon in boiling heat transfer. The eventual application of this work is to the thermal management of electronics.

In August 2005, **Dr. Ahmad Hoorfar, ECE**, received additional funding for *Squire Antenna Measurement* from DRS Technologies in the amount of \$8,580. This brings the total amount of funding from DRS to \$61,000 over the past two years.

Dr. Yimin Zhang, CAC, was awarded a \$12,000 grant from Ben Franklin Technologies Partners (BFTP)/Purrrfect Fence in November 2005. The purpose of this project, *titled RFID Tag Activated Pet Door*, is to design and perform experimental studies of pet doors using RFID-based detection technology. Dr. Zhang was also awarded a grant for Seamless Non-Line-of-Sight Communications for Urban Warfare of \$15,000 from BFTP/Adaptive Digital, this project is to support an on-going STTR contract from Air Force Office of Scientific Research (AFOSR) to develop novel approaches for space-time coding in urban terrain to leverage the interference caused by buildings and convert unreliable, low data rate communications into secure, high data rate non-line-of-sight communications.

DIRECTOR'S NEWS

Dr. Moeness Amin attended the IEEE International Symposium on Signal Processing and its Applications (ISSPA), held in Sydney, Australia, August 28th-31st, 2005. There, he chaired three sessions and presented five papers. The papers are co-authored by his students and postdocs as well as the Center Research Professors.

He also attended the IEEE Symposium on Signal Processing and Information Technology (ISSPIT) held in Athens, Greece in December 2005, where he presented three papers.

Dr. Amin served as an external evaluator of the Undergraduate Program Curriculum and Study Plans of the Electrical Engineering Department at the Ajman University of Science & Technology, United Arab Emirates.

He traveled in November 2005 to the Patuxent River Naval Air Station Complex (Pax River) in Virginia to discuss potential collaboration on GPS related research and development which could support the current NSWCCD/ONR contract.

Since July 2005, Dr. Moeness Amin has published one book chapter, two journal article and ten conference papers. These publications are co-authored by his colleagues, postdoctoral fellows, and graduate students.

CAC ACTIVITIES

The CAC hosted three technical all-day presentations given by visiting professors. Each presentation was attended by professors, post-doctoral fellows, and graduate students from Villanova University, as well as, members of the private sector.

■ September 27, 2005

Presenter: Dr. Selin Aviyente
Affiliation: Michigan State University
Topic: Information Theoretical Criteria in Through-Wall-Radar Imaging

■ June 24, 2005

Presenters: Dr. Steven Skinner
Affiliation: Wichita State University
Topic: Application of Blitzen to Lightning on Commercial Aircrafts

■ June 7, 2005

Presenter: Dr. Issa Panahi
Affiliation: University of Texas at Dallas
Topic: Acoustic Arrays and Blind Source Separation

The Center continues to host numerous meetings, aiming primarily at exploring new funding opportunities, internal & external reviews of current projects, and discussion of research finding with visitors and interested parties from academia, industry, and government.

On June 27, 2005 the CAC held the second annual meeting of the National Science Foundation - Partnership for Innovations (NSF-PFI) at the Villanova Conference Center. The *Partnership for Broadband Wireless Innovations, Development, and Commercialization* NSF grant is for \$600,000 over three years. The all-day meeting was attended by members of the partnership, which now includes eleven companies, three federal labs, two universities, two community colleges, a high school, and a State of PA agency. The meeting included presentations by the various partners on their contributions to the common themes of the partnership. The CAC faculty involved in this project are **Drs. Moeness Amin, Sohail Chaudhry, Amy Fleischer, Ahmad Hoorfar, Barry Johnson, and Randy Weinstein**.

Dr. Fauzia Ahmad, a CAC Associate Research Professor, attended the IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP) in Puerto Vallarta, Mexico, during December 2005. She presented one paper co-authored by Dr. Moeness Amin.

She also attended the IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting (APS/URSI), held in Washington D.C., July 3-8, 2005. There, she presented two papers co-authored with Dr. Moeness Amin.

Dr. Yimin Zhang, a CAC Associate Research Professor, attended the IEEE Vehicular Technology Conference (VTC) in Dallas, Texas in September 2005 where he presented one paper co-authored with Drs. Moeness Amin and Genyuan Wang.

CENTER FOR NONLINEAR DYNAMICS & CONTROL (CENDAC)

The researchers at CENDAC consisting of faculty and graduate and undergraduate students from the four engineering departments are pursuing numerous research projects funded by government and industrial agencies such as Office of Naval Research, National Science Foundation, SMI Steel Products, Ford Motor Company, Materials Sciences Corporation, and Ben Franklin Technology Partnership.

ACTIVITIES

CENDAC continued collaborations with numerous Federal laboratories and industries. **Dr. C. Nataraj**, the Director, continued collaborative arrangements with SPARTAN, which is the largest unmanned surface vehicle programs in the Navy working towards developing unmanned ships for the Navy and Homeland Security. CENDAC is working closely with Naval Sea Systems Command in its efforts to set up a premier Unmanned Surface Vehicles research facility in Philadelphia.

CENDAC continued to develop a strong relationship with Ford Motor Company Powertrain division who is funding our research on automotive emission control, directed by **Dr. James Peyton Jones** and **Dr. Kenneth Muske**. Other collaborative efforts include proposals and projects with Advanced Ceramics Research, Global Technology, Inc., Navmar Corporation, Titan Corporation, Ablaze Development Corporation, and Falone Medical Systems.

CENDAC has initiated a relationship with Advanced Ceramics Manufacturing, a Native American owned company located in Tucson, Arizona. **Dr. C. Nataraj, Dr. Sridhar Santhanam, Dr. Michael Raulli and Dr. K.-P. Jen** visited ACM in fall and discussed future collaborations. ACM's sister company called Advanced Ceramics Research is a leader in the development of unmanned air vehicles with whom we are co-authoring proposals to advance the state of the art in UAVs.

On the educational front, the CoE offers a new graduate certificate program in the area of Nonlinear Dynamics & Control which provides flexibility for working professionals. It includes a concentrated study of modern principles with both breadth and depth of coverage being emphasized. This certificate program will complement the research program at CENDAC.

CENDAC faculty were active participants at the American Society of Naval Engineers Intelligent Ships symposium held at Villanova University which had a strong Naval presence with engineers,

manufacturers and Navy officers in attendance. CENDAC faculty presented ten scholarly papers on research topics of importance to the Navy.

RESEARCH GRANTS

CENDAC received a grant from Office of Naval Research & Naval Sea Systems Engineering Station for \$450,000 to further research in unmanned surface vehicles. The chief objective of the various projects under this grant is the development of efficient unmanned vehicles that can function in dynamic and unstructured environments. Such a development will greatly enhance Navy operations by reducing the need for human personnel, and will result in substantial improvement of performance, safety, affordability and mission effectiveness.

We also received a grant from Advanced Ceramics Manufacturing for a research project on nano-structured ceramics for \$600,953. Nanostructured ceramics offer the possibility of enhanced strength and toughness which make them excellent candidates for applications such as machining. Villanova University is working in collaboration with ACM, Kennametal "and other industry partners to achieve the broad objective of developing suitable nanostructured ceramic tool materials for applications such as machining composite materials.

Other newly funded research projects include the following.

- CENDAC received a grant from Ben Franklin Technology Partners and Stein Seal Company for characterizing next generation seal materials. PI: **Dr. S. Santhanam, ME.**
- CENDAC received a grant of \$11,000 from Ben Franklin Technology Partners and Fairmount Automation for characterizing development of software protocols in automation equipment. PI: **Dr. S. Kulkarni, ECE.**
- CENDAC received a grant of \$11,000 from Ben Franklin Technology Partners and Ablaze Systems for investigation of a robotic transport system. PI: **Dr. H. Ashrafiuon, ME.**
- **Dr. Nataraj** received a grant of \$19,500 from AMSEC LLC, for investigation of electromagnetic bearings with permanent magnet bias for Navy applications.
- **Dr. Peyton Jones and Dr. Muske** received a grant for "Automotive Emissions, Control and Diagnostics Research" from E.G. Barry for \$20,555.

- **Dr. Peyton Jones and Dr. Muske** received a three-year grant of \$120,000 from Ford Foundation for "Model-based Three-way Catalyst Control and Diagnostics for Super Ultra Low Emissions."

STUDENT SUPPORT FOR RESEARCH AND OUTREACH

One of the central missions of our center is to provide a support environment for undergraduate and graduate students to actively pursue research. CENDAC strives to include undergraduate students in all its research projects.

- Turbo Research Foundation has set up a recurring student scholarship through CENDAC; the current scholarship is funding a graduate student, **Mr. Karthik Kappaganthu** to research and develop novel biped robots.
- In a special arrangement with Naval Sea Systems Command (Philadelphia), CENDAC continues to support mentoring of undergraduate students working on Internships over the summer months; these internships are externally funded by Office of Naval Research.
- As a part of the Villanova Engineering, Science, and Technology Enrichment and Development (V.E.S.T.E.D.) Program for Underrepresented Minorities, CENDAC facilitated a four week summer program for the School District of Philadelphia Robotics students. The program was directed by **Dr. H. Keith Moo-Young** and administered by Professors **James O'Brien, ME** and **Frank Mercede, ECE.**

STRUCTURAL ENGINEERING TEACHING AND RESEARCH LABORATORY

The new building, opened in June 2005, has significantly enhanced the experimental capabilities for research and education in structural systems, one of the focus areas of CENDAC. The principal users are the Structures Group consisting of **Dr. David Dinehart, Dr. Shawn Gross, Dr. Joseph Yost** and **Dr. Rebecca Hoffman**. Researchers are able to investigate seismic performance of a two story steel frame made of cellular beams; the load capacity of an 80-ft. long high strength concrete, pre-stressed bridge girder, and the effects of temperature and humidity on the long-term behavior of lightweight concrete.

VILLANOVA CENTER FOR THE ENVIRONMENT (VCE)

In addition to conducting interdisciplinary research, as a part of its mission on education, outreach and technology transfer, the Center hosted/conducted several workshops and seminars.

The Villanova Center for the Environment (VCE) was contacted by Wyeth Pharmaceutical Company to design, prepare and conduct a workshop to provide advanced mentoring to their employs on wastewater treatment. The Center conducted a week long workshop on "Wastewater Treatment: Process Theory and Applications" in Ireland for Wyeth pharmaceutical manufacturing plants. The instructors for the workshop were **Drs. G. Lee Christensen** and **Rominder Suri**. The workshop was attended by Wyeth professional from Ireland and U.S.A.

On August 10, 2005, VCE hosted a Conference at VU on "Opportunities for Naphthalene Reduction in Coatings and Solvents - A Dialog with Coil Coating and Coating Industry Leaders on Waste Minimization Opportunities". This was sponsored by the U.S. Environmental Protection Agency (EPA), National Coil Coaters Association and Pennsylvania Department of Environmental Protection (DEP), and was under VCE-EPA Partnership on Industrial Waste Minimization and Sustainability. Many professionals from the industry, government and academia attended the day long meeting. Many students, faculty and research staff from VU also attended the meeting. It was webcast live to numerous professionals around the country. Earlier, VCE hosted a similar workshop at VU on "Lead Free Solder Products in Electrical and Electronic Industry" sponsored by the EPA and PA DEP.

The VCE hosted a Workshop at VU in November dealing with energy efficiency. It was sponsored by Sunoco, Pennsylvania Department of Environmental Protection (DEP) and Department of Energy. The focus was on industrial best management practices - specifically, compressed air systems. The workshop was widely attended by professionals from the industry, government and academia.

The Center organized a Seminar given by Dr. Michelle Butler from Eastman Kodak Company who visited Villanova University on September 16. Dr. Butler talked about a novel technology to transform antibiotics in water. The presence of antibiotics in the environment is of increasing concern. Treatment of point discharges of antibiotic wastes holds promise as an approach for curtailing growing trends of microbial resistance. In her work, superheated water was investigated as a medium for the accelerated transformation of a target antibiotic, erythromycin. Observed transformation reactions were linked to the loss of antimicrobial function using biological assays.

CENTER STUDENTS AND RESEARCHERS PRESENT RESEARCH AT INTERNATIONAL AND NATIONAL CONFERENCES

Center students and researchers - **Kevin Woods** (undergraduate; ME), **Robert Chimchirian** (graduate; CEE), **Sandhya Meduri** (graduate; CEE), **Magdalena Velicu** (research associate; VCE), and **Hongxiang Fu** (post-doctoral fellow; VCE) working with **Dr. Suri** on research, traveled to North Carolina to present their work at the *International Conference on Energy, Environment and Disasters (INCEED 2005)*, Charlotte, NC USA, July 2005. The titles of their papers, which were published in the Proceedings, were: "Presence of low-level free steroid estrogens in the surface water;" "Determination of antibiotics in wastewater;" "Use of adsorption processes to decontaminate organic mercury thimerosal in pharmaceutical wastewater." Based on the work of Dr. Suri's research group, three additional presentations/publications were made at the Annual Water Environment Federation Conference held in Washington DC.

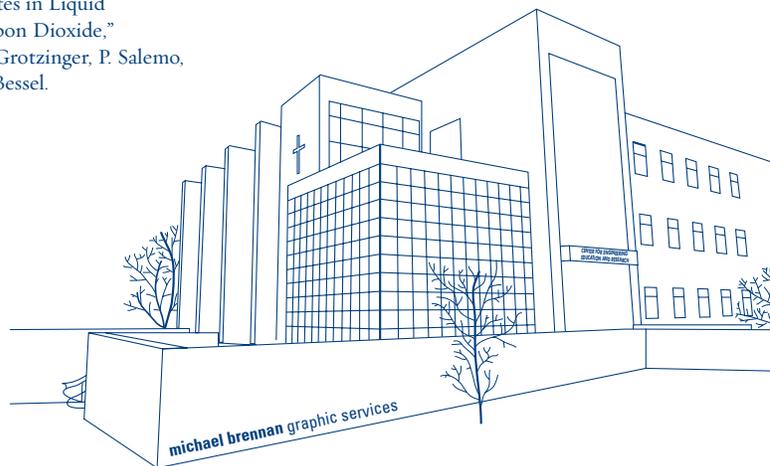
Dr. Charles Ochola (research faculty, CoE) working with **Dr. Keith Moo-Young** (Associate Dean for Graduate Studies and Research) presented two papers at INCEED, titled as "Reclaimed limestone residuals for the treatment of acid mine drainage" and "Utilization of Industrial Co-Product Materials as Containment Barriers in Sustainable Environmental Applications." Two other presentations by Dr. Moo-Young's research group were made at the Conference, and they were: "Investigation of Coal Tar Mobility in a Former MGP;" and "Application of woven synthetic for disposal of high water content waste."

The Center supported an undergraduate student in Chemical Engineering - **L. L. Grotzinger**, who worked with **Dr. Randy Weinstein** over the summer on copper chemical mechanical planarization. This process is a key step in the development of next generation integrated circuits. The processing of such memory devices in condensed CO₂ has been proposed as an innovative alternative to the technical and environmental challenges caused by aqueous media. Based on this work, a paper was published in *J. Chem. Eng. Data* (2005, 50, 2088), "Solubility of Several Short-Chain Lithium Dialkylthiocarbamates in Liquid and Supercritical Carbon Dioxide." R.D. Weinstein, L.L. Grotzinger, P. Salemo, D.M. Omiatek, C.A. Bessel.

SUMMARY OF RECENT VCE GRANTS/AWARDS INCLUDE:

- Rominder Suri (PI), Amanda Grannas, Anthony Lagarante, *Pollution Prevention of Pharmaceutically Active Chemicals from University Dormitories, and Municipal Wastewater Treatment Plants*, funded by US Environmental Protection Agency, \$133,750.
- Pritpal Singh (PI), K-P Jen, Mark Jupina, Sridhar Santhanam, Randy Weinstein, Chiu Liu, *Electron Microscope*, funded by the National Science Foundation, \$515,425.
- Rominder Suri (PI), *Environmental Protection and Sustainable Development*, funded by US Environmental Protection Agency, \$15,000.
- Rominder Suri (PI), *Workshops funded by Wyeth, EPA, Sunoco*, \$18,500.
- Robert Traver (PI), continuation of *Villanova Urban Stormwater Partnership*, funded by PA Department of Environmental Protection (DEP); \$175,000; contract under negotiation.

For more information on Center activities, please contact **Dr. Rominder Suri** at rominder.suri@villanova.edu or 610-519-8118.





Sergey G. Nersesov, Ph.D.

NEW FACULTY IN THE COLLEGE OF ENGINEERING

SERGEY G. NERSESOV, PH.D. DEPARTMENT OF MECHANICAL ENGINEERING

Sergey G. Nersesov joined the faculty of mechanical engineering as an assistant professor in August 2005. He received his B.S. and M.S. degrees in aerospace engineering from the Moscow Institute of Physics and Technology, Zhukovsky, Russia, in 1997 and 1999, respectively, with specialization in dynamics and control of aerospace vehicles. From 1998 to 1999 he served as a researcher in the Dynamics and Control Systems Division of the Central Aero-Hydrodynamic Institute (TsAGI), Zhukovsky, Russia. In 2003 he received his M.S. degree in applied mathematics and in 2005 he received his Ph.D. degree in aerospace engineering both from the Georgia Institute of Technology, Atlanta, GA.

His research interests include nonlinear robust and adaptive control, nonlinear dynamical system theory, large-scale systems, hierarchical nonlinear switching control, hybrid and impulsive control for nonlinear systems, system thermodynamics, thermodynamic modeling of mechanical and aerospace systems, and nonlinear analysis and control of biological and physiological systems.

Dr. Nersesov is a coauthor of the books *Thermodynamics: A Dynamical Systems Approach* (Princeton University Press, 2005) and *Impulsive and Hybrid Dynamical Systems: Stability, Dissipativity, and Control* (Princeton University Press, 2006). His secondary interests include sports, music, and the history and culture of Armenia.

QIANHONG WU, PH.D. DEPARTMENT OF MECHANICAL ENGINEERING

Qianhong Wu traveled from Lanzhou, in remote northwestern China, to New York City to realize his dream of studying biomedical and mechanical engineering in America. After completing his Ph.D. at the City University of New York in 2005, Dr. Wu joined the Mechanical Engineering Department at Villanova University and started his new academic career. Dr. Wu's research interests cover the broad area of biomedical and mechanical engineering, including fluid dynamic and transport aspects in cardiovascular system, fluid flow in brain and hydrocephalus study, sports sciences (the lift mechanics of skiing or snowboarding), transportation (a new concept for a train track and hydrodynamics study of unmanned surface vehicle), basic fluid mechanics and experimental fluid dynamics.

His research on microcirculation reveals the mysteries of the longevity of red blood cells, that is, why red cells can repeatedly pass through blood vessel openings that are smaller than they are without becoming damaged. His research on sports sciences explains the interesting phenomena in human skiing, that is, why a 70 kg human can glide over a snow layer without sinking to the base as would occur when the motion is arrested. His research on transportation introduces a new concept to the train track design which greatly reduces frictional forces.

Dr. Wu says, "I enjoyed the teaching and research experience at the City College of New York when I was a Ph.D. student there. I am very excited about joining Villanova University, teaching mechanical and biomedical engineering, and continuing my research. The faculty, staff and the students at VU are so supportive. They make me feel like coming home."



Qianhong Wu, Ph.D.



Rosalind Wynne, Ph.D.

ROSALIND WYNNE, PH.D. DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Rosalind Wynne recently received a tenure-track Assistant Professor position at Villanova University in the Department of Electrical and Computer Engineering. Dr. Wynne is committed to excellence in teaching, fundamental research, service to the technical community, and the generation of scholarship in students. She will teach a number of engineering courses including: Introduction to Optoelectronics, Introduction to Photonics and Optical Communications. Her teaching style will integrate aspects necessary for the development of scholarship in students: technical excellence, professional conduct and service to society. Dr. Wynne aspires to also provide an exciting research environment that promotes academic growth, the exchange of information and innovative ideas in the areas of photonics, fiber optic devices and sensors. Her research interests are in developing fiber optic sensors based on microstructured optical fiber technology for chemical sensing and biomedical applications. Microstructured optical fibers are an alternative to the standard cylindrical shaped optical fiber waveguide. These fibers can be used either as transmission fibers or as sensors.

Dr. Wynne is excited to contribute to technological advancements that have the potential to take fiber optic devices to the next frontier. Microstructured optical fiber evanescent-wave sensor devices with novel lattice structures for chemical sensing will be designed and developed in her research work to guide the future development of nano-structured optical sensors. Primary applications for Dr. Wynne's sensors include detecting DNA markers, detectors for intelligent buildings and controlling robotic instrumentation for both surgical and manufacturing industries. Evanescent-wave sensors have applications in chemical, biomaterial and hazardous material detection. These types of sensors based on microstructured optical fiber technology can be used to detect unknown materials in gas, aqueous and solid phases. Microstructured optical fibers are specialty optical fibers in which a series of carefully spaced periodic micron-sized cavities within an air-silica lattice in the cladding of the fiber provide extraordinary waveguide characteristics

not demonstrated by standard optical fibers. These sensors require very small (i.e. volumes of typically 0.8 μ L) amounts of material to reliably determine the molecular composition of the unknown sample. Microstructured optical fiber evanescent-wave sensors can be robust, compact chemical sensors that have the potential to benefit military, homeland security and biomedical interests. This research will be conducted in Villanova's Center for Engineering Education Research. Students will be responsible for fabrication of prototype sensors, sensor calibration and characterization and other experimental activities. These students will learn photonic and electromagnetic wave principles, guided-wave-optics fundamentals, fiber-optic characterization techniques and spectroscopy methods.

Dr. Wynne received her doctorate in Electrical Engineering from Boston University in May 2005, B.S. in Physics from Norfolk State University in 1999 and a M.S. in Electrical Engineering from Boston University in 2001. She is a member of the International Society for Optical Engineering (SPIE), the Institute of Electrical and Electronics Engineers (IEEE) and the National Society of Black Engineers (NSBE). She has received a number of honors and awards for her research contributions including the 2005 Boston University College of Engineering Dean's Award, the 2004 Ford Foundation Diversity Fellowships Dissertation Award, the 2004 SPIE Educational Scholarship in Optical Science and Engineering and the ONR/ HBECU Future Engineering Faculty Fellowship in 2001. Her advisor was Prof. Theodore Morse. Her thesis title was *Microstructured Optical Fiber Fabrication: an Integrated Parametric Approach*.

Outside of the lab, Dr. Wynne enjoys cooking, dancing, martial arts and learning to fly airplanes.



Server's wireless ESP wearable computer "watch."

ECE PROFESSORS HELP ESP SYSTEMS® LAUNCH NEW WIRELESS SOLUTION FOR THE RESTAURANT INDUSTRY

For the past two years, **Professor Edmond Dougherty** of the ECE Department has been developing a new wireless product. Employing over 70 miniature wireless microprocessors in a typical restaurant, the patented technology was successfully introduced in November of 2005 at the International Food Service Technology Expo by ESP Systems®. The system, "ESP," seamlessly and instantly connects everyone within a restaurant by using advanced, unique wireless technologies. The purpose of the system is to greatly improve the restaurant service model. The concept of the ESP system is simple: eliminate the many service "gaps" that plague the industry today, by empowering both the guests and employees through seamless and real-time wireless information. ESP creates a "wireless bubble" over a restaurant, connecting everyone within that bubble. Guests have a

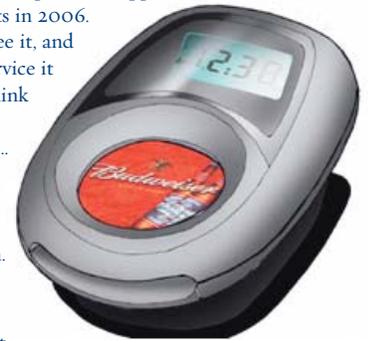
wireless device residing on the table that allows them to instantly, simply and intelligently communicate with the restaurant staff. Each employee, including servers, managers, hosts, and bussers, has a watch-sized wireless wearable computer that streams real-time information to them. When food is ready in the kitchen, the servers know it instantly through a vibration of their "watch" and an informative task list on the watch's display. If a table needs bussing, the bussers are signaled through their wearable computers. When the customer wants another beverage or the check brought to the table, no matter where the server is in the restaurant, the server is instantly informed of the customer's request once the customer presses a single button. The host and managers are also provided with instant as well as historical information that will help them manage their restaurant efficiently.

During the development process Professor Dougherty enlisted the help of Villanova's Center for Advanced Communications. Under a grant provided by Ben Franklin Technology Partners, **Dr. Moeness Amin**,

Dr. Ahmad Hoofar and their students studied the wireless coverage needed within the various architectures that might be found in typical restaurants. Based on the studies, the Villanova team provided Professor Dougherty and ESP with practical advice and solutions to help insure that the miniature wireless devices will provide full coverage throughout any restaurant configuration.

The system is expected to appear in restaurants in 2006. When you see it, and enjoy the service it provides... think of Villanova Engineering... it should make good dinner conversation.

More information is available at espsystems.net



Wireless ESP Table Button, used by diners to communicate with the restaurant staff



Lauren Jones, Dr. G.F. Jones and the afternoon class prize winner with his winning structure and VU Engineering T-shirt prize. Lauren is holding the winning structure from the morning class.



"If we only had some chocolate and graham crackers, we could make s'mores."

EDIBLE STRUCTURES 101

Dr. G. F. Jones, Professor and Chairman of the ME Department, gave a talk on engineering to a group of Denver, CO junior high school students during fall break while visiting his daughter's class. Lauren Jones, A&S'01, teaches at the Rocky Mountain School of Expeditionary Learning, a charter school dedicated to interdisciplinary and collaborative learning.

In addition to discussing the opportunities as an engineer as shown on the College's "employment trees," Dr. Jones ran a marshmallow and toothpick structure contest. Using toothpicks as columns and beams held together by marshmallow welds, the winners built the highest free-standing structure occupying a 16 square-inch base and were awarded a Villanova T-shirt for their efforts. The contest was a suggestion from Prof. James O'Brien also of ME.

As seen in the photos, the students not only learned something about engineering, but enjoyed the challenge of stable structural design. One student commented that engineering is great because where else can one get to eat the welds at the conclusion of a structures contest.

FACULTY NEWS

CHEMICAL ENGINEERING DEPARTMENT

Dr. William J. Kelly attended the Mid-Atlantic Biochemical Engineering Consortium 2005 Conference at Rutgers University where he presented "Modeling Oxygen Transfer in Bioreactors Using CFD". He co-authored the paper with Mayur Jain. Dr. Kelly presented "Using CFD to Model Bioprocessing Operations" at Eli Lilly and Company in June 2005. Dr. Kelly received a grant of \$15,000 from Merck and Company for "Optimizing the Precipitation and Centrifugation of Antigenic Polysaccharides." He also received an equipment donation of a 20 liter stainless steel fermentor worth \$70,000 new from Merck and Company.

CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT

Dr. Metin Duran has received two research grants: "Fatty Acid Methyl Ester (FAME) Profiles of *Escherichia Coli* and Enterococci as an Innovative Microbial Source Tracking Technology," sponsored by PA Water Resources Research Center/USGS, \$17,560; and "Methane Generation and Pathogen Inactivation in a Full-scale Anaerobic Digester Amended with a Natural Bioenhancer," sponsored by Organica Biotech, Inc., \$1,500.

In October 2005 **Dr. Chiu Liu** took the position of guest editor to organize a special issue concerning Innovative Use of Materials for Highway Construction for the Journal of Materials in Civil Engineering.

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

Dr. Ahmad Hoorfar co-organized and co-chaired two special sessions on "Through-Wall Imaging and Sensing" and "Advances in Evolutionary Optimization Techniques in EM" at the 2005 IEEE AP-S International Symposium on Antennas and Propagation held in Washington, DC on July 3-8, 2005. He also co-chaired another session on "Small and Reconfigurable Antennas," at the same symposium.

Dr. Bijan Mobasseri and ECE graduate student **Michael Marcinak, CPE '04** visited Air Force Research lab in Rome, NY on September 29, 2005. The purpose of the day long visit was oral presentation of the final report for work done on digital watermarking of compressed media. This project which lasted 18 months was carried out by seven students performing tasks in various capacities. They are, including Marcinak, graduates of CPE class of '05: **RJ Berger, Yatish Nairakar, Bill Wysocki, Drew Blaich, Matt Ell and Zach Cohen.**

Dr. Pritpal Singh participated in a NSF Workshop on the Impact of Globalization on Electrical and Computer Engineering Education in Washington, D.C. November 14-15 organized by the Electrical and Computer Engineering Department Heads Association.

MECHANICAL ENGINEERING DEPARTMENT

Dr. Amy Fleischer attended the 2005 ASME Summer Heat Transfer Conference in San Francisco where she presented the paper "Thermal Management of Heat Generating Devices in Close Proximity on Printed Circuit Boards." Dr. Fleischer presented the paper "The Effect of Die Attach Voiding on the Thermal Resistance of Chip Level Packages" at the 2005 American Society of Mechanical Engineers/Pacific Rim Technical Conference and Exhibition on Integration and Packaging of MEMS, NEMS and Electronic Systems in San Francisco. Dr. Fleischer organized a technical session entitled "Heat Pipes and Thermosyphons" at the 2005 ASME International Mechanical Engineering Conference and Exposition, in Orlando.

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Ahmad, F., Amin, M. and Kassam, S. "A Beamforming Approach to Stepped-Frequency Synthetic Aperture Through-Wall Radar Imaging," *Proceedings of the IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, Puerto Vallarta, Mexico, December 2005.

Ahmad, F. and Amin, M.G. "A Noncoherent Approach to Through-the-Wall Radar Imaging," *Proceedings of the Eighth International Symposium on Signal Processing and its Applications*, Sydney, Australia, August, 2005.

Ashrafioun, H., and Reddy, J. V. "Variable Structure Control of a Three-Link SMA-Actuated Robot," *Proceedings of the ASME DETC*, Sept. 24 - 28, 2005, Long Beach, CA, paper no. DETC2005-84868.

Ashrafioun, H., and Irwin, R. S. "Shape Change Maneuvers for Attitude Control of Underactuated Satellites," *Proceedings of the American Control Conference*, Jun. 8-10, 2005, Portland, OR, pp. 895-900.

Duran, M., Alm, E.W., Stedtfeld, R.D., Haznedaroglu, B.A. and Hashsham, S.A. (2005) "Detection and Occurrence of Indicator Organisms and Pathogens," *Water Environment Research*, Vol. 77, No. 6, pp. 659-717.

Elahinia, M. H., Ashrafioun, H., Ahmadian, M., and Tan, H. (2005) "A Temperature-Based Controller for a Shape Memory Alloy Actuator," *ASME Journal of Vibration and Acoustics*, vol. 127, no. 3, pp. 285-291.

Engheta, N., Hoorfar A. and McVay, J. "Electrodynamics of Space-Filing Curves," *International Conference on Electromagnetics in Advanced Applications*, Turin, Italy, September 2005.

Haznedaroglu, B.Z. and Duran, M. (2005) "Fatty Acid Methyl Ester (FAME) Profiles of Total Coliforms as a New Tool for Predicting Sources of Fecal Pollution," *Proceedings of the WEFTEC '05: The Water Quality Event*, pp. 7142-7149, October 29-November 2, 2005, Washington, DC.

Haznedaroglu, B.Z. and Duran, M. (2005) "Predicting Sources of Fecal Pollution Using Fatty Acid Methyl Ester (FAME) Profiling," *Proceedings of WEF TMDL 2005 Conference*, pp. 634-644, June 26-29, 2005, Philadelphia.

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Jain, M., Parandani, M.R., Roush, D., Göklen, K. and Kelly, W.M. (2005) "Using CFD to Understand How Flow Patterns Affect Retention of Cell-Sized Particles in a Tubular Bowl Centrifuge," *Industrial Engineering and Chemistry Research*, Vol. 44, Issue 20, pp. 7876-7884.

Jen, K-P, Hao, D. and Xu, L. (2005) "Failure Analyses of Beryllium Copper Bourdon Tubes," *Materials Science and Technology 2005 Conference*, Pittsburgh, September 25-28, 2005.

Komanduri, R., Hoorfar, A. and Plonski, F. "Performance Analysis of Dual Stacked E-Shaped and Multi-slot Patch Antennas on a USV Platform for Broadband VHF Applications", accepted for *Intelligent Ship Symposium*, Villanova, PA, June 2005.

Komanduri, V.R., Hoorfar, A. and Engheta, N. "Low-Profile Array Design Considerations for Through-the-Wall Microwave Imaging Applications," *Proceedings of the 2005 IEEE International Symposium on Antennas and Propagation*, Washington D.C., July 2005. Invited paper.

Liu, C. "Van der Waals force and Asphalt Concrete Strength and Cracking," *Journal of Engineering Mechanics (ASCE)* 131 (2).

Liu, C. "Strength Ratio and the Fractal Dimensions of Concrete," *Proceedings of 3rd International Conference on Construction Materials*, UBC, British Columbia, Canada.

Liu, C. and Wang, Z. "Fuel Consumption, Vehicle Emission, and Traffic Congestion Estimation at a Network Level: A New Approach," *Proceedings of 12th ITS World Congress*, San Francisco, California, November 6-10, 2005.

McVay, J., Hoorfar, A. and Engheta, N. "Thin Absorbers Using Space-Filling-Curve High-Impedance Surfaces," *Proceedings of the 2005 IEEE International Symposium on Antennas and Propagation*, Washington D.C., July 2005. Invited paper.

McVay, J., Engheta, N. and Hoorfar, A. "Numerical Study and Parameter Estimation for Double-Negative Metamaterials with Hilbert-Curve Inclusions," *Proceedings of the 2005 IEEE International Symposium on Antennas and Propagation*, Washington D.C., July 2005. Invited paper.

McVay, J., Engheta, N. and Hoorfar, A. " Numerical Study of Phase Variation through Double Negative and Single-Negative Media Formed by Space-filling Curve Inclusions," *International Conference on Electromagnetics in Advanced Applications*, Turin, Italy, September 2005.

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Mobasser, B., Marcinak, M. and Fleming C. "Digital Video Watermarking for Metadata Embedding in UAV Video," *Milcom 2005*, Atlantic City October 17, 2005.

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Nikkhah, M., Ashrafiun, H., and Fahimi, F. "Sliding Mode Control of Underactuated Biped Robots," *Proceedings of the ASME IMECE*, Nov. 5-11, 2005, Orlando, FL, paper no. IMECE2005-79362.

Obeidat, B., Amin, M.G., Zhang, Y. and Hoorfar, A. "Sensor Configuration in Polarized Antenna Arrays," *Proceedings of the International Symposium on Signal Processing and its Applications*, Sydney, Australia, August. 2005.

Obeidat, B., Zhang, Y. and Amin, M. "Performance Analysis of DOA Estimation Using Dual-Polarized Antenna Arrays," *Proceedings of the IEEE International Symposium on Signal Processing and Information Technology*, Athens, Greece, December 2005.

FACULTY PAPERS CONT.

- Pierro, V., Galdi, V., Pinto, I. M., McVay, J., Engheta, N. and Hoorfar, A. "Electromagnetic Properties of Space-Filling Wire Structures Based on Grid-Graph Hamiltonian Paths: Some Preliminary Results," *The 2005 IEEE International Symposium on Antennas and Propagation*, Washington D.C., July 2005.
- Radhakrishnan, T. and Nandan, U. (2005) "Milling Force Prediction Using Regression and Neural Networks," *Journal of Intelligent Manufacturing*, February 2005.
- Ren, P., and Ashrafiun, H. "Sliding Mode Tracking Control of Underactuated Surface Vessels," *Proceedings of the ASME IMECE*, Nov. 5-11, 2005, Orlando, FL, paper no. IMECE2005-79276.
- Setlur, P., Amin, M. and Ahmad, F. "Indoor Imaging of Targets Enduring Simple Harmonic Motion Using Doppler Radars," *Proceedings of the International Symposium on Signal Processing and Information Technology*, Athens, Greece, December 2005.
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- Shoeb, M., Amin, M. and Ahmad, F. "Narrowband Source Localization for Indoor Wireless Environments," *Proceedings of the International Symposium on Signal Processing and Information Technology*, Athens, Greece, December 2005.
- Singh, P., Kantamsetti, S., Raskauskas, M. and Torres, V. "Design and Analysis of Urban Building Integrated PV System," *ASME Solar Conference*, Orlando, FL, August 1-4, 2005.
- Singh, P. "Fuzzy Logic Modeling of Hybrid Power Systems for Unmanned Surface Vehicles," *2005 Intelligent Systems Applications to Power Systems Conference*, Washington, DC, November 1-4, 2005.
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- Tepe, N. and Duran, M. (2005) "Fatty Acid Methyl Ester Profiling for Microbial Community Structure Analysis of Activated Sludge Processes with Nitrification," *Proceedings of the 3rd European Bioremediation Conference*, Paper 125, July 4-7, 2005, Chania, Greece.
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ECE MENTORING PROGRAM ENTERS FIFTH YEAR

The ECE Mentoring Program has entered its fifth year with career panels given by the mentors to the present junior class on October 24 and November 7, 2005. The program has over fifty mentors working with the present senior and junior classes. The student assignments have been coordinated with faculty member **Dr. Frank Mercede** through his classes with these students. **Dr. Julia Bukowski** has provided great support to the program from its beginning.

The ECE mentoring program was started and conducted by **Marie Maguire, EE '69**, an Industrial Advisory Board (IAB) member and mentoring committee chair. Maguire is a partner in Caramanico, Maguire Associates, a sales and management development consulting company which works with engineering companies. The other founder and committee member is **Sam Brattini, EE '63**, also an IAB member and executive consultant at Kema Inc., an electrical utilities consultancy.

The mentoring program welcomes ECE graduates to work with students, contributing to their growth as professionals.

You can contact Marie Maguire at mariem@caramanico.com or Sam Brattini at sam.brattini@kama.com to volunteer.

Being a mentor takes a commitment of about 30 minutes per month; it can be accomplished over the Internet or via phone. You can come to campus as well, but it is not required. The program welcomes ECE alumni with varied work experiences, for example, business, law, medicine, etc. along with ECE careers.

The committee, faculty and students would greatly appreciate your participation.

ROBOCUP TO THE RESCUE

Engineering Undergraduates and Graduates beware: there may soon be a new threat in engineering competitions. Remember your old high-school science classes? Most likely a few experiments with paper airplanes and popsicle sticks. That is about to change. Imagine giving high school students the opportunity to work with highly advanced sensor integration and robot locomotion. Now give those students the opportunity to put their work on display and put it up against the work from hundreds of college graduates. This is exactly what a team of 13 from Benilde-St. Margaret's high school in St. Louis Park, Minnesota were able to do. These thirteen students were participants in an innovative new program called Advanced Competitive Science.

In May of this year, the team traveled to the U.S. Open RoboCup Rescue competition. The RoboCup competition has been made popular in past years by the soccer playing robots often on television. The RoboCup Rescue division, separate from the soccer playing robots, deals with urban search and rescue in the real world.

The competition is sponsored by the Department of Homeland Security and closely monitored by the National Institute of Standards and Technology for applications in post 9/11 America. These robots were capable of locating victims in a complex arena designed to mimic a real world disaster site.

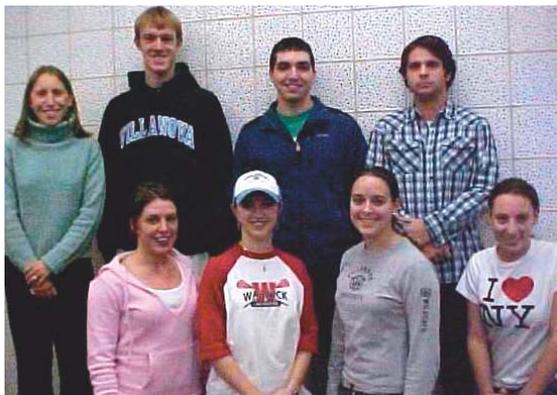
The fake victims were modeled after everything ranging from crying babies to full size adults and then placed in various places throughout the arena, trapped under rubble in various conditions.

The job of the team was then to use the robots to go into the disaster and locate the most victims and document their condition.

The U.S. Open this year was held in conjunction with Georgia Tech and boasted a field of graduate students from prestigious schools such as Carnegie Mellon, University of Pittsburgh, and the Niigata Institute of Technology. Using highly advanced prototyping and fabrication processes, including a rapid prototyping printer capable of printing out CAD parts in full three dimensions, the Benilde-St. Margaret's team designed and manufactured 4 unique robots. The robots utilized thermal imaging, motion tracking, sound detection, and CO2 measurement. The team also manufactured a laser mapping system for the robots, capable of making a map of the disaster site and sending it remotely to rescuers who could then use it to go into the area and locate the victims.

The team went on to win the competition as the "Cinderella story," and journeyed to Osaka, Japan to compete as national representatives in the International RoboCup. Under the program instructor, Mr. Timothy Jump, the Advanced Competitive Science curriculum will continue to grow after international exposure, with many other high schools showing interest in such an advanced engineering curriculum. Giving students the skills needed for going on to post-secondary education in engineering may position schools such as Benilde-St. Margaret's as firsts in the concept of high schools as research institutions.

*The College of Engineering welcomes **Joseph Martyn**, the writer of this article and a member of the Benilde-St. Margaret's team, to the College of Engineering Class of 2009.*



ESC members hosted the Stress Buster, front row, l. to r. M. McLaughlin, K. Donmoyer, M. Flynn, and A. Ferguson, back row, L. Alsdorf, (ESC Advisor), J. Pawelczyk, and M. Bochanski.



Students enjoyed a break from studying with a movie and refreshments at the December 13 Stress Busters.

INTRODUCING ESC FOR 2005-2006

Engineering Student Council (ESC) is a staff-advised, student-run organization that is the liaison between the undergraduate Engineering students and the Dean, including the administration of the College of Engineering. Liz Alsdorf, the Administrator of Undergraduate Support Programs, is the advisor to the ESC. The overall structure is based upon an Executive Board and a Council comprised of a representative from each Engineering club and organization.

ESC has a dual mission: communication and event hosting. While meeting with Dean Barry Johnson, other College of Engineering staff, and the student body, ESC strives to maintain an informative means of communication. This area mainly focuses on issues that students may face. ESC hosts and sponsors several student-centered events throughout the year.

While the ESC fosters a strong sense of community, it also provides extraordinary leadership opportunities for students on many levels. In addition to students who serve on the Executive Board, ESC members serve as leaders within various Engineering clubs, organizations, and student branches of professional organizations.

This year's Executive Board is comprised of **Matt Bochanski, ME '06**, (President), **Robert Guinivan, CEE '06**, (Vice President), **Kelly Donmoyer, CEE '09** (Secretary), **Stephen Serpe, CHE '06**, (Treasurer), and **Maggie Flynn, ME '06**, (Webmaster). The Executive Board developed and wrote an active Constitution that formally outlines the Council's goals and objectives.

Selected from a very impressive pool of eager freshmen Engineers, the ESC recently welcomed five freshmen onto the Council: Kelly Donmoyer (Secretary), **Michael Kane, EE**, and **Maggie McLaughlin, CHE**, (Freshman Representatives), **Ashley Ferguson, ME** and **Joseph Pawelczyk, ME** (Committee Co-chairs). While their primary role is to serve as the voice of the freshman class, these recently selected members will also gain leadership skills that will

help further the mission of the ESC in years to come.

On December 13th, the second annual Stress Buster took place in CEER 001. Hosted and sponsored by ESC, this event, held in the evening of Reading Day before final examinations, was an opportunity for students to enjoy some free catered food and a movie. A raffle was held and four students won the chance to have a fifteen minute massage during the Stress Buster.

Other events that are planned by ESC for the Spring 2006 semester include: a Freshman Scavenger Hunt, an Engineering Formal, and Engineers' Week, which will take place during the week of February 19th-25th, 2006. ESC is a chartered member of the National Association of Engineering Student Councils (NAESC), and ESC representatives attended the North Atlantic Regional Conference in Pittsburgh, PA this past October. Robert Guinivan, the Vice President of ESC, is currently the President of the North Atlantic Region of NAESC. In April 2006, ESC will send current as well as newly elected officers to the National Conference in Washington, D.C. This is an opportunity for engineering student councils from around the country to get together and share ideas.

The following is a sample of what some of the Engineering clubs and organizations have been doing so far this school year. The Concrete Canoe Club has been working on the concrete mix and hull design of their canoe, and is currently in the process of building a mold and constructing a canoe. AIChE sent student representatives to an AIChE Conference in Cincinnati, OH, in late October and also had a junior-senior football game in the same month. IEEE has been meeting and discussed valuable topics such as internships in Electrical Engineering. The PEERS hosted a Freshmen Dorm visit where they addressed students' concerns about their first round of final exams as well as other anxieties.

For further details, please visit ESC's website: http://www.engineering.villanova.edu/students/student_organizations/esc

WILDCATFISH, THE HUMAN POWERED SUBMARINE



Team Wildcatfish prepares to test buoyancy for their submarine in the David Taylor Model Basin.

The 8th International Submarine Races were hosted at the Naval Surface Warfare Center's Carderock Division David Taylor Model Basin in Bethesda, MD from June 27th through July 1st. Twenty-two human powered submarines from all over the US, Canada and the Netherlands competed in speed trials. This was Villanova's first entry into the competition.

A human powered submarine is a flooded vessel (meaning it is not pressurized and the driver must wear SCUBA gear to breathe) that is of a hydrodynamic shape, powered via bicycle pedals and steered by the driver inside it. The teams take turns during the week racing their submarines down a hundred meter stretch of the basin and their fastest speeds are recorded. The Villanova team achieved a respectable official speed of 1.471 knots with their submarine, **WildCatfish**.

The submarine was built as a Mechanical Engineering Senior Design Project. Team members consisted of **Brian Comber, Kevin Comber, Richard Donovan, Michael Siebert, Timm Strayer,** and **Erin Vogel**, all members of the Class of 2005.



ENGINEERING ARMY ROTC CADET NEWS

Cadet Ian Lipsitz, CHE 06, completed the Army ROTC Leadership Development and Assessment Course (LDAC) at Fort Lewis, WA this past summer. After LDAC, Cadet Lipsitz attended Cadet Troop Leader Training (CTLT) at Osan Airbase in South Korea where he served four weeks as a platoon leader in an Air Defense Artillery unit.

Cadet Jonathan Quercia, ME '07, completed the physically demanding Army Airborne School this past summer and earned his parachutist wings.

Cadets Marc Federico, CPE '08, and Myles Durkin '09 graduated from Cadet Initial Training on October 3rd and are newly inducted cadets into the Army ROTC program. Cadet Durkin also contracted with the Army in September as a four-year ROTC scholarship winner.

WELCOME TO VILLANOVA CRICKET CLUB

Villanova cricket was confined to the environs of CEER and the ground behind it until a couple of years ago. But the efforts of the cricketers bore fruit recently with Nova getting a chance to play a few cricket clubs in and around the Philadelphia area. Over the last three years Villanova's cricket team had a chance to play matches against BOCC (British Officers Cricket Club), Prior Cricket Club, Eclipse Cricket Club, Lansdale Cricket Club etc. These friendly games helped Villanova gain some much needed exposure. Some surprising and unexpected victories boosted the confidence of the cricketers.

Villanova played its first official cricket match against Prior Cricket Club in June 2004. **Harish Koduri, MSEE '07**, was instrumental in scheduling and arranging the game. It took a lot of effort to coordinate and schedule the game. A group of players who played "CEER" cricket constituted the team and they were led by the young and enterprising Koduri. A convincing victory over Prior gave Villanova new hope and confidence as this became one of the defining moments in Villanova's cricket history.

The formation of Villanova Cricket Club (VCC) last year was a significant development in the history of Nova cricket. At this point the International Student Office at Villanova University became involved in the activities of VCC with Mr. Steve McWilliams and Mr. Hubert Whan Tong showing a keen interest in the games to be played. The lack of a ground and proper sporting equipment became a huge hurdle in the cricketers' path. The ISO has since then released funds especially for cricket.

This is a really commendable and appreciable gesture by the ISO and it has gone a long way in helping out cricket at Nova. Still there are many hurdles in VCC's path such as the need for better sporting equipment and most importantly a play ground for practice.

This year an important development has been the participation of Villanova in the Inter collegiate cricket tournament organized by Temple University. Despite their busy academic schedules, the members of VCC are making a concerted effort to put up a good show in the tournament.

The VCC extends special thanks to Dean Barry Johnson and the staff of the College of Engineering who supported this new team financially and with their presence at the games during the tournament.



Dean Barry Johnson joined with the Villanova Cricket Club for a team photo.

**Send your news to
THE FINAL DRAFT**

at egr.thefinaldraft@villanova.edu

STUDENT NEWS

Berat Z. Haznedaroglu, MSWREE '05, was the recipient of the 2005 Graduate Student scholarship from the Air and Waste Management Association, Delaware Valley Chapter. The \$2,000 scholarship was awarded in recognition of his work on FAME profiles of indicator organisms for predicting sources of microbial pollution in water environments, under the direction of Dr. Metin Duran. Currently, he is pursuing a PhD degree in the Chemical and Environmental Engineering Department of University of California, Riverside.

Jamie R. Lefkowitz, CEE '06, received the Villanova University Undergraduate Student Collaborative Research Award for Summer 2005. Jamie has been working with Dr. Metin Duran on whole-cell fatty acid composition of fecal streptococci to predict sources of fecal contamination.

Korich Mark, ME '07, is the recipient of a collaborative undergraduate research award for Spring of 2006 for investigating the possibility of reinforcing concrete using smart materials. Korich's work is under the direction of Dr. Chiu Liu of the Civil and Environmental Engineering Department.



ALUMNI NEWS

55 Joseph P. Welsh, CE, received the 2005 Wallace Hayward Baker Award from the Geo-Institute of the American Society of Civil Engineers. He was recognized for a 50-year career of landmark contributions to the technical and practical applications and developments of ground improvement methods.

84 Lt. Col. Myles Murphy USAF, EE, was promoted to his present rank following his graduation from the Air Force Air Command Staff College. He is commander of the Deputy Mission Support Group of the 913th Airlift Wing at Willow Grove Air Reserve Station.

85 Ann M. Odorski Cannoni, Esq., CHE, is an intellectual property attorney in The Webb Law Firm in Pittsburgh. Experienced in chemical and mechanical fields, she has a concentration in pharmaceutical, polymer and organic chemistry.

86 James Verner, ME, has been named vice president of manufacturing at Woodings Industrial Corp. in Mars, PA. The firm manufactures key components in the iron-making process.

87 Bethann Sosnowski Schlitt, CHE, announced the opening of a specialty food company, Secret Sauces LLC, featuring marinades that address the consumer's demand for convenience in creating savory meals with minimal effort. The products are available online at www.secretsauces.com and are being introduced in specialty food stores.

93 Craig Fennie, EE, MSEE '96, has been awarded one of the first Lucent Technologies and Rutgers University

Fellowships in condensed matter physics. At Rutgers Fennie's doctoral research involves the use of first-principles theoretical calculations to understand the properties of materials that could greatly improve the data storage and processing capacity of computers. Lucent and Rutgers announced creation of the fellowships, which provide a stipend of \$30,000 per year, last December.

Brian T. Smith, EE, was selected this past June to become one of nine NASA mission control flight directors in the class of 2005. With the heavy responsibility of this position and the limited number of people who have held it, it is one of the most sought-after in the National Aeronautics & Space Administration. From 1998 through 2005 Smith, a radio communication expert, held the position of flight controller where he was responsible for the communication and tracking system for the Interim Control Module spacecraft.

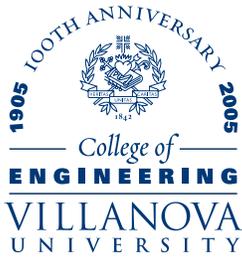
97 Michael Heyer, EE, earned his Professional Engineering (PE) license in the state of New York. He is a System Control and Protection Engineer with Keyspan Energy in Hicksville, NY.

99 Thomas W. Brady, MCE, was a co-winner of the 2005 Young Civil Engineer of the Year Award, presented by the Philadelphia section of the American Society of Civil Engineers. He is senior highway project manager with Vollmer Associates in its Kennett Square, PA office.

00 LT Wyatt Smith USN, EE, is stationed at the University of Pennsylvania's NROTC unit.

SAVE THE DATE

Mark your calendar for the annual **Engineering Alumni Society Awards Reception** on **Friday, June 9, 2006**. The new reception format allows plenty of opportunity to visit, network, and see exciting student projects.



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THANK YOU

Your contributions to the Engineering Alumni Society are helping EAS reach its goals in support of the College of Engineering at Villanova University.

EAS HAS:

- offered two \$1,000 scholarships to support the Dean's new minority initiative.
- funded ten student projects totaling \$7,500.
- supported students in their trips to India, Nicaragua, and Honduras, where they were able to provide desperately needed technical and manpower assistance to these underprivileged areas, creating a unique educational experience for students and faculty alike.
- redesigned the format of the annual awards banquet to focus on Student Projects in a less formal setting.
- organized our first-ever reception on the deck of the USS Gettysburg, an event we hope to expand.

The ability to support these programs comes from the generosity of EAS members and the dedication of our Board and volunteers. We extend our heartfelt thanks to those who have contributed to our efforts!

If you wish to be a part of EAS, there is still time to join!

Check your membership, renew your membership, make donations, read our minutes, and see everything else we do at: www.engineering.villanova.edu/alumni/ We look forward to hearing from you!