College of ENGINEERING VILLANOVA UNIVERSITY

THE FINAL DRAFT

VILLANOVA UNIVERSITY

COLLEGE OF ENGINEERING

FALL/WINTER 2004 ~ NEWSLETTER

VOLUME 25 ISSUE 2

www.engineering.villanova.edu/newsletter

EXCELLENCE INNOVATION INTEGRITY

GROUNDBREAKING OF THE STRUCTURAL ENGINEERING TEACHING AND RESEARCH LABORATORY

Participating in the Groundbreaking are l. to r.: Rev. Kail, Ellis, O.S.A., Rev. Edmund J. Dobbin, O.S.A., Mr. Thomas Portland, Dean Barry Johnson, Dr. Ronald Chatterton, and Dr. David Dinehart.

Rev. Edmund J. Dobbin, O.S.A. and Dean Barry Johnson led Villanova's engineering community in a groundbreaking ceremony to mark the beginning of construction on the new Structural Engineering Teaching and Research Laboratory on October 28. Following an opening by the Villanova Band and the ROTC Color Guard, Rev. Kail Ellis, O.S.A. gave the Benediction, followed by speeches marking the occasion. The laboratory will be used by undergraduate and graduate students as well as faculty in the Department of Civil and Environmental Engineering for integrated teaching and research on innovative structural materials and structural systems.

Father Dobbin remarked that integrating research into the undergraduate curriculum is an example of the University's commitment to "active learning" as espoused by St. Augustine. "It was the drive and enthusiasm of the Structural Engineering faculty which allowed for the approval of this building. This is innovative learning."

Dean Johnson explained that while other Colleges expose their students to research through senior seminars and senior capstone projects, Villanova's College of Engineering is unique in the integration of research into the curriculum in the undergraduate sophomore, junior and senior years. "Fitting in with the College's strategic plan, the Structures Lab will ensure that we offer an educational program that is relevant in today's world, one that prepares our students for their future choices in academia, service, and the world of business," Johnson said.

Thomas Portland, ChE'69, Chair of the College of Engineering Advisory Council, and recently retired Vice President of Air Products, emphasized the importance for research in keeping up with the ever increasing demands of the field of engineering for new and better products. It is incumbent upon the College to ensure its undergraduate and graduate curriculum keeps abreast of the advances in field while contributing to the growing knowledge, he said.

Ronald Chadderton, Chairman of the Department of Civil and Environmental Engineering, said, "I trust that calling this laboratory a center for structural engineering teaching and research will send the correct message that this Department, this College, and this University are committed to carry on our tradition of sincere dedication to the education and welfare of all our students."

David Dinehart, Associate Professor in Civil and Environmental Engineering, thanked the University administration for their on-going support. Dinehart also recognized the works of the other members of the Structural Engineering team, assistant professors Joseph Yost, Shawn Gross and Rebecca Hoffman.

Dinehart noted that the new laboratory is a "quantum leap forward." Students will be 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, among other research. Dinehart also recognized the Civil and Environmental Engineering graduate students and alumni for "helping to set the standard" that will be maintained in the new facility.

Following the speeches, more then 70 guests watched as Fr. Dobbin, Fr. Ellis, Dean Johnson, Mr. Portland, Dr. Chadderton and Dr. Dinehart wore hardhats with the College of Engineering lettering and simultaneously broke ground with shiny, silver shovels. The facility, set to open in June 2005, is located on a site adjoining the Facilities Services Maintenance Building off Ithan Avenue and County Line Rd. An artist rendering is posted by the road near the construction site and is also available on the College of Engineering's website.

CEREMONY AND DEDICATION TO FORMER CHAIR OF ECE DEPARTMENT

Dr. S.S. Rao was remembered at a Memorial Service on September 17.

Remembered by faculty, coworkers, and former students alike, the late Dr. S.S. Rao, who served as the ECE Department chair from 1983 until his death in April 2004, was honored at a service in the St. Thomas Chapel on Friday, September 17, 2004. After welcoming remarks by Dean Barry C. Johnson, Dr. Pritpal Singh led the ceremony. Obviously considered a man deeply dedicated to his department, Dr. Rao received great praise from a variety of men who knew him best. Dr. Ahmad Hoorfar, Dr. Moeness Amin, and Prof. Ed Char, among many others, recalled Dr. Rao's wonderfully charming sense of humor, which was not only legendary in the department but also his personal method of relieving tension among the faculty. Everyone also commented on his sharp intelligence and his ability to tackle problems head-on and with a motivation

continued on next page

CEREMONY *continued on next page*

that would spread to all. Dr. Rao's son, Shon, thanked all who had gathered to honor his father. Father Dobbin made a few impromptu remarks on Dr. Rao's importance to the evolution of the ECE Department.

The ceremony itself was a unique blend of Dr. Rao's Hindu tradition, with music chose specifically for his legacy and readings from the Bhagavad Gita, and the University's Augustinian tradition, represented by Father Shawn Tracy and Prof. Ed Dougherty.

Dr. Rao's extraordinary efforts over the last few decades of technological expansion and evolution have had a lasting effect on the ECE Department and the University. His talent and dedication helped shape the department in many ways.

Dr. S.S. Rao will live on in the hearts and minds of the people who knew him. A new Distance Education Center in the CEER building, room 314, has been dedicated to his memory. A plaque on the wall of this room, which is becoming a pivotal part of engineering education, reads, "*This distance education classroom is dedicated to the memory of Dr. S.S. Rao, Chair, ECE Department, 1983-2004, whose leadership helped pioneer distance education in the College of Engineering at Villanova University.*"

Dr. S. S. Rao will be truly missed.

NEWSLETTER STAFF
Dr. John Molyneux
Nancy O'Connor

CONTRIBUTORS:
College Centers
College Departments
Dr. Moeness G. Amin
Will Caverly, A&S '08
Brian Comber, ME '05
Edmond Dougherty, BEE '69, MSCS '86
Nancy Dudak
Frank Falcone, CE '70, MSCE '73
Dr. Shawn Gross
Dr. Gerard F. Jones, ME '72
Dr. H. Keith Moo-Young
Danielle Maniscalco, ME '05
Janice Moughan
Dr. C. Nataraj
Seán O'Donnell, CPE '00
Karen Ringlaben, C&F '02
Dr. Rominder Suri
Melanie Terburg, MPA '02
Helen Tursi
The Villanovan
Villanova Magazine
Blueprints

NEWARK'S CHIEF ENGINEER RECEIVES AWARD

James D. Adams, CE '84, was named Government Civil Engineer of the Year by the North Jersey Branch of the American Society of Civil Engineers. The award is given annually to an individual who has contributed substantially to the advancement of civil engineering in the government sector. It was presented to Adams at the North Jersey Branch's Awards Dinner on Friday, May 21, 2004 at the Prime Hotel in Fairfield.

Adams, a veteran civil engineer with a long background in New Jersey and Newark-area projects and issues, was named Newark's Engineering Director in July 2003. Since then he has launched or overseen numerous initiatives that have significantly changed the city's streetscape, public facilities, and permit application processes. His leadership has stressed three concepts: quality, integrity and customer service. He has introduced new technology to improve operations and customer service, created forums to help residents and developers understand the permit process, and completed major projects.

Newark's Mayor Sharpe James said, "James Adams is a Newark native who returned to his roots to serve his neighbors. We are proud of the strong work ethic, broad knowledge, and commitment to community that he has brought to the Department of Engineering and the City of Newark. The results of his efforts are being seen by our residents and visitors. This award is a validation from his peers of the outstanding nature of his work and leadership."

James D. Adams, Chief Engineer, City of Newark

New associate Dean of Research in the College

H. Keith Moo-Young, Ph.D., P.E., has joined Villanova University as Professor of Civil and Environmental Engineering and Associate Dean of Research in the College of Engineering. His primary responsibilities include development of the College's research strategy, policies and practices, as well as leadership of the College's programs to continuously improve the research infrastructure and expand relationships with governmental and industrial funding agencies.

Dr. H. Keith Moo-Young

Dr. Moo-Young comes to Villanova from Lehigh University, where he was a member of the Civil and Environmental Engineering faculty for the past nine years. He is recognized nationally as a leading teacher and scholar in Environmental Engineering. Currently his primary areas of interest are hazardous and solid waste management, such as the remediation of inorganic contaminants in acid mine drainage and groundwater, recycling and reuse of industrial co-product materials such as fly ash, slags, sludges, and corrective strategies for contaminated sediments including in-situ capping, confined disposal facilities, and dredging. He has received research funding from organizations such as the Department of Energy, the National Science Foundation, EPRI, Penn DOT, Pennsylvania Department of Commerce, Corp of Engineers, Batelle, General Electric, and Federal Highway Administration.

Dr. Moo-Young holds a Ph.D. in Civil and Environmental Engineering from Rensselaer Polytechnic Institute (RPI), and an M.S. degree from RPI in Civil and Environmental Engineering. He also holds a B.S. in Civil Engineering, majoring in Environmental Engineering, from Morgan State University, and an Executive Master in Management of Technology from the University of Pennsylvania.

Dr. Moo-Young has received numerous national awards such as the U.S. Black Engineer of the Year in 2001 for Promotion in Higher Education, AAAS Science, Technology and Policy Fellowship, National Defense Science and Engineering Graduate Fellowship, Anderson Consulting Faculty Fellowship, and General Electric Faculty Fellowship. He has published over 85 papers in peer-reviewed journals, books and conference proceedings, and has delivered over 60 presentations at conferences, workshops and invited lectures.

Dr. Moo-Young is a member of many professional organizations such as AAAS, American Chemical Society, International Society for Industrial Ecology, Association for Environmental Health Science, ASCE and American Association for Environmental Engineering and Science Professors (AAEESP). He has participated on ten federal panels.

Dr. Moo-Young and his wife Monika have two sons H. Keith III and Edward James. Dr. Moo-Young is of Jamaican heritage and was raised in Washington, DC.

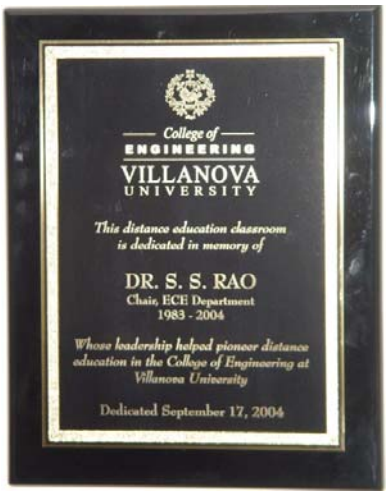
This Year in Distance Education: New Rooms and New Degrees

Last year saw the first fully online master's degree offered at Villanova University. It came from the College of Engineering's Civil and Environmental Engineering Department. For the first time in the history of the school, you could earn a Master's Degree (MCE or MSWREE) without ever coming to campus. Following the lead of schools like Stanford, Johns Hopkins, and University of Delaware, Villanova's College of Engineering entered the age of Distance Education.

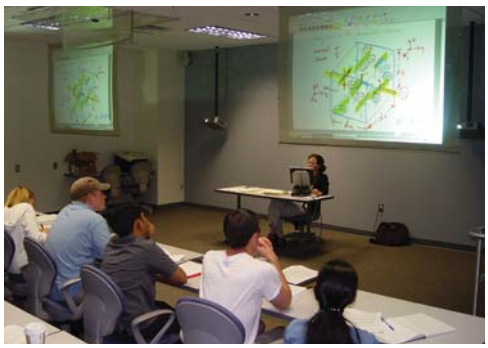
This summer, the College completed the construction of two brand new, first-rate DE classrooms. Funded by the revenue generated by the CEE program, these two showpieces are at the cutting edge of communication and DE technologies. They include touch panel controls, web and VTC broadcasting capabilities, the world's quietest projectors, and screen tech nologies that you need to see to believe. One of the new rooms, room 314, was dedicated to the memory of Dr. S.S. Rao, who helped pioneer DE throughout the College.

Starting in the Fall of 2004, a second online degree was added from the ME department. The MSME degree follows the path pioneered by the CEE department a year earlier. ECE is not far behind, offering a few classes this Fall, a certificate in the Spring, and a full degree starting in Fall 2005. Total enrollment for the Fall was 66 students.

If you are interested in the Online Master's Program, or would like to see the new rooms, please visit us online at: http://engineering.villanova.edu/distanceed/



Dedication Plaque


Class in CEER 312


CEER 314

Archbishop Desmond Tutu Brings His Message to Villanova

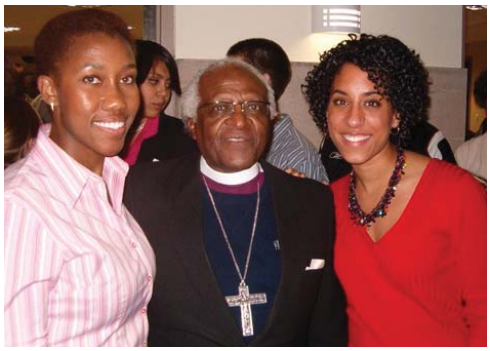
Thanks to the generous co-sponsorship of the Villanova University College of Engineering, Archbishop Desmond Tutu graced our campus with his charisma, inspiration, spirit and blessings on the historical evening of October 6, 2004. He was invited by Villanova to receive the 2004 Adela Dwyer/St. Thomas of Villanova Peace Award.

The event was exceptionally special. Several Villanova faculty, staff and students were invited to the reception and dinner preceding the presentation of the award. There, in a more intimate setting, Villanova truly experienced the warmth and enthusiasm of his spirit and refreshing laughter. It was delightful to listen to him talk about his wife and children and share his love of Frozen Pudding ice cream. He taught several of us students how to pronounce the three "clicks" of his native Xhosa language. At the end, we surprised him with a cake to help him celebrate his upcoming birthday.

Later, a very diverse crowd of over 6000 people from Villanova and local universities, colleges and high schools gathered in the Pavilion. The community came together to open their minds and hearts to receiving the Archbishop's wisdom. When he took the stage he graciously thanked everyone for the award and for such a warm welcome. Then, with his unique sense of humor and his passionate enthusiasm, he began to share the powerful story of the struggle of his people in South Africa and his personal experiences as the chair of the Truth and Reconciliation Commission.

Following his speech, there was another short reception. As I watched flocks of people follow him around for autographs, photos and other things with which to chronicle the night, I stood back and watched as he desperately tried to find some R & R next to the pastoral musicians. He finally made it to his destination. As the choir filled the Bartley Atrium with their beautiful voices, I watched as the Archbishop's head danced back and forth.

At that moment, I realized something very important that I might never have, if I had not had the honor of meeting him. I realized that he is just like every one of us. What he has accomplished in his life is what we are all capable of doing if we are not fearful of the potential of courage and hope and



Archbishop Tutu with student leaders of the South Africa service trip: left, Nia Jackson, A&S '05, and right, Danielle Maniscalco, ME '05.

our capability to do good. He gave us the gift of solidarity to prove to us that any one of us can make a difference in this world.

Unfortunately, many people were left empty-handed, having been unsuccessful in acquiring desired mementos for their scrapbooks. However, the most memorable token that anyone could have received from that night was a piece of Archbishop Tutu's vision. He came to share his inspirational story. He came to empower us to embrace forgiveness. He came to inspire us to a new form of leadership. He came to encourage us to think about others when we make choices. He came to spark a flame of love and hope in our hearts.

I think this message is so appropriate for engineers. Engineers have an unbelievable responsibility to the global society. They are the innovators behind the technology, transportation, communication, clean water and clean air of a better future. For this reason, as a Mechanical Engineering senior, preparing to lead 12 Villanovans to Cape Town and Durban, South Africa in January 2005, I am honored to be a member of a college that recognizes the importance of a diverse curriculum and encourages students to consider the bigger picture when making decisions regarding a career path. By endorsing and sponsoring such an event, the College clearly recognizes these values and their importance in education.

Archbishop Desmond Tutu's message was not over presumptuous. It was very simple, and it placed responsibility in the right hands. His only hope, in fact our only hope, is that it was well received. Regardless, Villanova will never forget such a remarkable event.

Danielle Maniscalco, the author of this article, is a senior in the Department of Mechanical Engineering. She offered the closing prayer at this notable event.

University Welcomes First Cohort of Master of Technology Management Students

Villanova University welcomed its first cohort of students as part of a new and innovative graduate program that combines expertise from the business, computer science, and engineering faculties. The group is composed of 18 students with an average GPA of 3.1 and originates from 11 colleges and universities and 10 organizations. These emerging leaders entered the program with strong technical competence and the hope of expanding their business sense. The MTM students will complete their curriculum requirements (48 credits) in less than three years.

The Master of Technology Management (MTM) is a cross-disciplinary program designed for individuals with engineering or computing backgrounds who desire to stay abreast of changing technologies while increasing their knowledge of advanced business functions. The distinct and customized curriculum fosters a flexible and stimulating learning environment without interrupting job responsibilities. Tracks include: chemical, civil, computer, electrical, or mechanical engineering, web-based technology and commerce, knowledge-based systems, or software engineering.

According to Dr. Barry C. Johnson, Dean of the College of Engineering, "…..students will graduate from this program with a balanced comprehension of the strategic role of technology in business, and equipped with effective tools to successfully manage both."

The MTM Program was designed in response to the demand for practicing engineers and high-tech professionals to make decisions, motivate teams, manage new technologies, and develop new solutions. Students enrolled in the program will participate in a Leadership Challenge in October, have a firsthand look at global business through an international travel experience, and gain state-of-the-art knowledge in engineering fields such as technology road-mapping, environmental policy, and system engineering. By taking only three additional courses, students can also earn a Master's degree in Computer Science or any of the engineering disciplines.

Villanova's Monday Night Football Connection

No, we are not referring to the Philadelphia Eagles' running back Brian Westbrook, though he is certainly an excellent Villanova representative. We are referring to another kind of bird, four Villanova engineering students and a Villanova professor.

"The bird", as it is affectionately known in the broadcast industry, is the Emmy award winning Skycam. Every Monday this fall it will soar in the night skies over an NFL football field providing live high definition video for ABC Sports and its millions of viewers worldwide.

The camera "flies" over the football field through its connection to four computer controlled cable reels. Responding to a joystick controlled by a camera person in the press box, the length of each of the one-tenth inch diameter fiber optic support cables changes in synchronism to allow the camera to be smoothly transported, or "flown" to any position in the stadium. The fiber optics within the support cables are used to send commands to the camera as well as to carry the video feed from the Skycam to the broadcast truck. As the camera glides over the field, a number of on-board processors, sensors and miniature motors silently work to keep the camera stable while executing the operator's commands for the camera pan, tilt, zoom and focus motors.

Professor Ed Dougherty, ECE, designed and built an earlier version of the Skycam, and this past summer was asked to manage a project to build both the ABC Sports Monday Night Football and ESPN Sunday Night Football high definition versions of the Skycam in time for football season. To supplement the full time Skycam technical staff, Professor Dougherty turned to a number of Villanova engineering students to help with assembly, set up, test, documentation, parts specification and purchasing,. The students, **Andrew Buckreis, CPE, '05, Jeff Menosca, EE '04, Michael Hoyer, ME '05**, and **Daniel Kesack, CPE '05** demonstrated how electrical, mechanical and computer engineers can work together on a complex system to achieve results – the two systems were built on time, within budget and are currently traveling to various NFL stadiums around the country.

Jeff Menosca with Skycam

Menosca is now working at Skycam full time. George Simmons, another Villanova graduate is spending his second NFL season traveling with the Skycam.

Auto Racing Camera Tested in Villanova Wind Tunnel

Academy Award winning Garrett Brown, of The Moving and Talking Picture Company, needed to take his latest camera invention to the next level. FlyCam is a point to point aerial camera system used for motion pictures, concerts and sporting events. For sporting events, the FlyCam has performed over ice-skating, hockey, soccer, basketball, tennis, football, Nascar, Formula I racing, Summer X games, Winter X games and multiple venues at the Sydney Olympics. Supported in the air by cables, the FlyCam can rapidly move in a straight line between two points. The system has performed at many events where it has smoothly glided on the cables at speeds up to 45 MPH, but a big demand for the system has been in auto racing where the average speeds can top 200 mph. This past summer, FlyCam was asked to work a number of racing events in Australia and requested to run at 70 mph.

Garrett knew the motorized FlyCam system had the capacity to move at those speeds, but would the camera be able to provide a stable picture not only while speeding along, but while performing remote controlled camera functions such as pan, and tilt? To help explore this question, Garrett called his old friend, **Villanova ECE Professor Ed Dougherty**. Dougherty described the CEER Wind Tunnel facility and introduced Garrett to **Dr. G.F. Jones** and **Chris Townend**, both of the ME Department. After some brainstorming, and a few adjustments, the CEER Wind Tunnel was used to run a number of very useful initial experiments with the FlyCam. Tests of a variety of aerodynamic wind shielding materials provided the information Garrett needed to allow FlyCam to take on the Australian auto racing events. More formal testing at Villanova, including instrumented scale model testing in the wind tunnel, is planned for later this year and expected to be in conjunction with a combined ME/ECE Senior Project.

For further information on FlyCam, see www.flycamusa.com.


Garrett Brown installing Flycam in the wind tunnel

Wireless Team Connects with Award

The University Wireless Network Project Team, of which **Steven Brady, BCPE '99, MSCPE '04**, is a member, received *The Distinguished Service Award for a Team* at the academic convocation on St. Thomas of Villanova Day, September 9, 2004. Brady is Manager of Information Technology in the College of Engineering. The award cited the "dedication and relentless effort" of this cross-functional team which brought a state-of-the art wireless network to the University benefiting the entire campus community. Through an enormous amount of time and effort the team achieved results beyond the initial plan of providing wireless data network access to Tolentine, CEER and Bartley. In the same timeframe they were able to make access available at Connelly Center, Dougherty Hall and Falvey Library as well.

CENTER FOR ADVANCED COMMUNICATIONS (CAC)

On Thursday, October 7th, the CAC hosted its 2004 Annual Meeting in the Cinema Theater in the Connelly Center. The meeting included presentations given by Villanova University Faculty and Postdoctoral Fellows, as well as Company representatives on the Center's current research projects in the areas of communications, signal processing, antennas, and microwave. A short tour of CEER's Research Laboratories was also provided. The Center is currently involved in numerous research projects with various government and industrial partners including DARPA, ONR, NSF, AFRL, BFTP, and The Boeing Company.

CTC/DARPA GRANT $1,505,878

The Center for Advanced Communications received a grant in the amount of $1,505,878 from the Defense Advanced Research Projects Agency (DARPA), to continue research on Through-the-Wall Microwave Imaging. This stage of the research will entail collection of real data measured in typical indoor settings and verification of electromagnetic models and signal processing approaches for waveform scattering and attenuation. The team working on the CTC/DARPA contract consists of Villanova University, University of Pennsylvania, NSWCCD, BAE Systems, and General Dynamics. The grant is monitored by representatives from DARPA, Air Force, and Concurrent Technologies Corporation (CTC).

BOEING CONTRACT

The Boeing Company has issued a contract to the CAC for $70,000. The research tasks to be performed are lightning EMP, HERP, & HERF analysis using the "Blitzen" software. The Blitzen software was developed by Dr. Jack Nachamkin and donated to the University as an intellectual property gift by Boeing in April 2003. The Blitzen software, valued at more than $1million, is designed to predict the indirect effects of lightning strikes on composite aircraft structures.

On August 19, 2004, Dr. Jack Nachamkin generously donated $7,500 to the CAC for the purpose of purchasing a personal computer and software to support research and development related to the Blitzen Software.

DIRECTOR'S NEWS

Since the spring, Dr. Moeness Amin has published two articles which appeared in IEEE Signal Processing Letters and IEEE Transactions on Signal Processing. He co-authored with his colleagues, graduate students, and postdoctoral fellows thirteen conference papers which were presented in Princeton (New Jersey), Montreal (Canada), Monterey, Anaheim, and Pacific Grove (California), Barcelona (Spain), Denver (Colorado), Beijing (China), and Sendai (Japan). These conference papers cover the research areas of Anti-Jam GPS, Over the Horizon Radar, Through-Wall Imaging, Wireless Communications, Space-Time Coding, and Time-Frequency Signal Analysis. He also attended a 2-day meeting in Toulouse, France on August 30-31 as the US representative on the NATO Task Force and Exploratory Team in Through-the-Wall Imaging. He has reviewed six journal papers and served on the technical committees of two IEEE Conferences.

CAC GRANTS/AWARDS

Dr. Moeness Amin received a grant from the Office of Naval Research (ONR) in the amount of $63,205 for *Array Processing for Interference Suppression of GPS Receivers*, and also received another grant from ONR in the amount of $60,000 for conducting research on *Classification and Discrimination of Sources with Time-Varying Frequency and Spatial Spectra*. He received a grant in the amount of $15,000 for *Micro-Doppler Representation* from the Canadian Department of National Defense and Dr. Amin received a grant from Ben Franklin Technology Partners (BFTP) and VerdaSee Solutions in the amount of $16,000 for *Beamforming and Antenna Technologies for RF Tagging Applications*.

Dr. Robert Caverly received an additional $120,625 funding for the grant *Curriculum Development in Systems for Smart Communications* from the National Science Foundation. The PIs will develop a series of educational concept modules covering basic and advanced topics in smart communications technology that overlap not only the PIs' research areas but also the "best practices" in the field. Both **Drs. Moeness Amin** and **Ahmad Hoorfar** are Co-PIs on the project.

Dr. Ahmad Hoorfar received a grant in the amount of $15,000 from Anteon Corp. for *VHF Prototype Antenna Research*. He received a $5,720 grant from DRS Technologies for a *Squire Antenna Test*. Dr. Hoorfar also received a grant from the ONR for *Novel Electrically Small Antennas & Metamaterial High Impedance* Surfaces in the amount of $58,676.

Dr. Mark Jupina received a grant from the Office of Naval Research (ONR) in the amount of $54,955 for *Chemical Sensing through Magnetic Resonance on an Integrated Circuit*.

Dr. Stephen Konyk received a grant from the Office of Naval Research (ONR) in the amount of $56,826 for *Distributed Autonomous Control Action Based on Sensor & Mission Fusion*.

Dr. Bijan Mobasseri received a grant in the amount of $149,483 from the Air Force Research Lab for *Lossless Watermarking of Compressed Media*. He also received a grant from the Office of Naval Research (ONR) in the amount of $57,850 for Digital Watermarking of Autonomous Vehicles Imagery & Video Communications.

Dr. Pritpal Singh received a grant from the Office of Naval Research (ONR) in the amount of $58,107 for *Unmanned Surface Sea Vehicle Power System Design & Modeling*.

Dr. Yimin Zhang received a grant from the Office of Naval Research (ONR) in the amount of $50,381 for *High-Rate Multiuser Cooperative Diversity Systems*.

Dr. Moeness Amin accepting donation from Dr. Jack Nachamkin

CENTER FOR NONLINEAR DYNAMICS AND CONTROL (CENDAC)

The researchers at CENDAC consisting of faculty and graduate 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, W. M. Keck Foundation, SMI Steel Products, Aerzen USA, Ford Motor Company, High Concrete Structures, Inc., Materials Sciences Corporation and Ben Franklin Technology Partnership.

ACTIVITIES

CENDAC played host to engineers and managers from Ford Motor Company Powertrain division who visited Villanova, toured our facilities and had technical discussions preparatory to funding research on automotive emission control. Dr. Nataraj, the Director, accompanied Dean Barry Johnson on a visit to the University of Dayton Research Institute for a two-day discussion on the issues that are particular to Catholic institutions and to explore collaborative research. He also visited the SMART TechTrends 2004 R&D Conference in Pittsburgh, widely attended by industries, sponsors and universities in the Mid-Atlantic Region. CENDAC set up a booth, along with the M.E. Department, providing publicity information about ongoing research at the COE in general, and CENDAC in particular.

Over the summer Dr. Nataraj was invited to serve as the research advisor to 12 student interns funded by Office of Naval Research at NAVSSES (Philadelphia) working on various projects related to Unmanned Vehicles Research. He also initiated collaboration in this area of research with Dr. David Cartes (Florida State University) and Dr. Ali Eydgahi (University of Maryland) who were ONR summer fellows at NAVSSES. CENDAC is working closely with Mr. John Metzer at NAVSSES on its efforts to set up a premier Unmanned Surface Vehicles research facility in Philadelphia.

GRANTS

Newly funded projects include the following:

Dr. Hashem Ashrafiuon received a grant of $60,000 from Office of Naval Research for *Robust Control for Navigation and Actuation of Unmanned Surface Vehicles*.

Dr. Farbod Fahimi received a grant of $60,000 from Office of Naval Research for *Real Time Trajectory Planning for Groups of Unmanned Vehicles*.

Drs. Amy Fleischer & Randy Weinstein received a grant of $60,000 from Office of Naval Research for *Mitigation and Detection of Thermal Signatures of Unmanned Surface Vehicles*.

Dr. G.F. Jones received a grant of $45,293 from Office of Naval Research for *Thermal Management for Control of Structural Morphing*.

Dr. C. Nataraj received a grant of $21,000 from BFTP and Aerzen USA for *Automated Condition Assessment of Screw Compressors*.

Dr. C. Nataraj received a grant of $60,000 from Office of Naval Research for *Intelligent Navigation of USV's With Obstacle Avoidance*.

Drs. James Peyton Jones and **Kenneth Muske** received a grant of $20,000 from Ford Motor Company for continuing research in aftertreatment of automotive emissions.

Dr. Sridhar Santhanam received a grant of $59,565 from Office of Naval Research for *Use of Smart Materials for Structural Morphing of Control Surfaces of Unmanned Surface Vehicles*.

VILLANOVA CENTER FOR THE ENVIRONMENT (VCE)

INTERDISCIPLINARY UNDERGRADUATE PROJECTS

Several undergraduate students from different engineering disciplines participated in Center research projects.

Three undergraduate students - **Vanessa Torres, ECE '05, Mary Raskauskas, ECE '05, and Madeline Flynn, ME '06**, worked together with **Dr. Pritpal Singh, ECE**, on a building integrated photovoltaic systems project. The students developed a MATLAB code that provided solar tracking, direct, diffuse and global solar radiation for any latitude and time of the year. PV simulations for a single solar cell as well as modules were performed. The code was evaluated for variables such as temperature, and verified. The second part of the project used AUTOCAD software to visually demonstrate shading and reflectivity in urban settings. A primitive model was drawn and simulated in AUTOCAD with the help of *Accurender*, where several of the solar geometry components could be set as well as calculated. By varying the surface materials of the buildings and intensity of the sun, shading components and problems were more clearly observed. The students presented their work to the Consortium for Sustainable Design and Research of SE Pennsylvania, and on Earth Day at Temple University. Dr Singh said "I have been very impressed by the hard work, enthusiasm and excitement that the students have brought into this project. They have been spending weekends at the library looking up information, and using any spare time to work on the project. I have not seen more motivated students working on a project."

This past summer, their research took Mary and Vanessa cross-country and trans-Atlantic, to the American Solar Energy Society's *Solar 2004* in Portland, OR, and to the International Solar Energy Society's *SAMSA* (Summer Academy for Mediterranean Solar Architecture) in Rome, IT. At SAMSA, the students attended a 10-day short course where they presented their design on energy efficient buildings. They were awarded a certificate of participation and completion from the President of the University of Roma. Partial financial support to the students for their travel was provided by VCE.

Mary and Vanessa report that "these trips were fairly spontaneously planned and we were hesitant to go at first. But looking back, we never realized learning could be so much fun and take us so far. It definitely was not all fun and games in these beautiful cities because we sat inside enduring hours and hours of lectures and practical sessions. But we could never be more thankful for the opportunities that our research through Dr. Singh has provided us. Not only have we made important US and worldwide connections, we have made friends who share the same passion in renewable energy. We have learned so much from these two experiences, which leaves us thirsting for even more."

Three undergraduate students – **John Tecklenburg, CEE '05, Kevin Woods, ME '07, and Christopher Thajudeen, ECE '06**, are working with Dr. Rominder Suri, CEE, on environmental projects. These projects involve industrial wastewater treatment, use of ultrasound to improve process efficiencies, and chemical sensors.

US EPA PARTNERSHIP FOR INDUSTRIAL WASTE MINIMIZATION AND SUSTAINABILITY

Recently, the Center established a *Partnership for Industrial Waste Minimization and Sustainability* with the US Environmental Protection

continued on next page

(VCE) *continued*

Agency (EPA) Region 3 Office of RCRA Program. The EPA Region 3 covers the States of Pennsylvania, Maryland, Virginia, West Virginia, and Delaware. The primary objective of the Partnership is to explore, via research and outreach activities, approaches for addressing the complex and multifaceted reality of waste minimization and sustainability. The cooperative and collaborative efforts of EPA and VCE require the development and application of innovative technology, comprehensive outreach, and the extension of these efforts beyond traditional disciplinary boundaries with the goal of establishing a more holistic and integrated problem solving environment.

The combined resources of EPA and VCE, along with industrial and other governmental partners who may join over time, will provide a significant regional benefit in directing interdisciplinary experts towards:

- Addressing specific, complex industrial waste minimization problems
- Protecting the environmental health, and performing life-cycle analysis
- Reducing consumption of natural resources by advancing sustainability concepts
- Stimulating and publicizing new waste management technology

In the Center, there are ongoing projects dealing with environmental issues in USA, Europe and Canada. The Center projects are being supported by a variety of funding entities covering federal, state and private sectors. They include National Science Foundation, Environmental Protection Agency, Dept of Agriculture, National Institute of Health / Nanocorp Inc, US Army/Bipolar Inc, US Navy/Nanocorp Inc, PA Department of Environmental Protection, PA Department of Community and Economic Development, PA BenFranklin Technology Partners, Wyeth Pharmaceutical, Parse Technologies, SRS Inc, Organica Biotech Inc., Little Buck Poultry Farm, and Claneil Foundation.

VCE GRANTS

Recent VCE grants/awards include:

Dr. Metin Duran, *Evaluating Effects of Natural Enzymes* and *Plant-based Materials on Anaerobic Digestion of Biosolids*, BFTP and Organica Biotech Inc, 2004, $11,200.

Dr. Rominder Suri, *Fate and Analysis of Natural and Synthetic Estrogenic Hormones* in Wastewater, 2004, additional funding of $59,000 by Wyeth Pharmaceutical/Parsons.

Dr. Rominder Suri, *Bench-scale Removal of Mercury from Wastewater* using Adsorption Process, Phase I, Wyeth Pharmaceutical, 2004, $25,000.

Dr. Rominder Suri, *Optimizing Environmental Performance – LSE Process Analysis*, BFTP and Parse Technologies, LLC., 2004, $12,500.

Dr. Rominder Suri, *Phosphorous Stabilization in Poultry Manure*, BFTP and Little Buck Poultry Farm, 2004, $10,000.

Dr. Pritpal Singh, on waste minimization and energy efficiency, *Fuzzy Logic Based Nondestructive Testing of Reserve Batteries*, Navy/Nanocorp, 2004, $235,000.

Dr. Pritpal Singh, *Testing of Prototype Solar Roof Tiles*, BFTP and Solar Roofing Systems, Inc., 2004, $12,000.

Dr. Robert Traver, *Villanova Urban Stormwater Partnership: A Technical Partnership in Support of Industry Change*, PA Department of Environmental Protection, 2004, $160,000.

Dr. Robert Traver, *Stormwater Wetlands Monitoring* at Villanova University, PA DEP - Coastal Zone Monitoring Program, 2004, $50,000.

Dr. Carol Bessel, Nanoscale Catalysis: Synthesis, Characterization, and Reactivities, National Science Foundation, 2004, $188,000.

Chemical Engineering

Beginning in the fall of 2004, two new graduate-level certificate programs incorporating courses in biochemical engineering, chemistry, biology and engineering principles will be offered. These certificates have been designed for working professionals and for students interested in careers in the pharmaceutical and biotechnology industries.

Each certificate program includes two required courses in biochemical engineering along with two elective courses chosen by the student, based upon background and career interests. Both Biochemical Engineering courses are new and offered by the Department of Chemical Engineering. The first course focuses on the design and optimization of bioreactors, and the second course focuses on bioproduct purification using such processes as centrifugation, filtration, extraction, adsorption and chromatography. Students with an engineering background are encouraged to select engineering-science courses that lead to the **Certificate in Biochemical Engineering**. Those with a science background may elect courses in chemistry or biology that lead to the **Certificate in Biotechnology**. The courses may be taken in any order.

Each of these interdisciplinary certificate programs can be completed in approximately two years. Courses in the Biochemical Engineering Certificate program also apply towards a Masters of Science in Chemical Engineering, for those students pursuing a master's degree. The first Certificate in Biochemical Engineering will be awarded in January of 2005. It is expected that 4-5 other students will receive certificates in June of 2005.

FACULTY

Dr. William Kelly received a grant of $25,000 from GlaxoSmithKline to investigate *Inactivation of Spores with Moist-Heat Sterilization*. The investigations will be carried out over the next two summers.

Dr. William Kelly co-authored two papers: "Dynamic Modeling for Continuous Fermentation of Plasmid-Harboring E. Coli.," along with faculty colleague **Dr. Kenneth Muske** and MChE Student **Alok Asoor, MChE, '04**, and "Modeling Shear-Induced Damage to CHO Cells during Tangential Flow Filtration," along with Bruce Vickroy of Merck and Co. and **Karen Lorenz, BChE, 04**. Both were presented at the 227th National Meeting of the American Chemical Society, Anaheim, CA in March 2004. He also co-chaired a session on "High Resolution Purification," an especially important unit operation in thebiotechnology and pharmaceutical industries.

Dr. Kenneth Muske served on the national organizing committee for the Seventh IFAC Symposium on Dynamics and Control of Process Systems held in Boston in July where he presented the paper "On-board Diagnostic and Fault Detection Strategies for an Automotive Three-way Catalyst," co-authored with **Dr. James Peyton Jones** of the ECE Department.

Dr. Vito L. Punzi received the Christian R. and Mary F. Lindback Award for Distinguished Teaching during the Commencement Exercises in May, 2004.

DEPARTMENT NEWS

Civil and Environmental Engineering

The second CEE Day, which incorporated undergraduate and graduate research as well as senior design project presentations, was held on April 23, 2004. Several members of the Advisory Committee participated as design project evaluators. CEE Day was fully funded by members of the committee. The fourth William B. Fergusson Memorial Lecture was held as the keynote address for CEE Day. **Mr. Donald Fusilli, CE '73**, CEO of Michael Baker Corporation gave the lecture, which is supported by contributions to the William B. Fergusson Fund established in the department.

The Civil and Environmental Engineering Department is in the final year of phasing in its new curriculum. This new curriculum was developed with input from our advisory committee, students, and faculty. Changes included new Undergraduate Service Learning and Undergraduate Research courses, which were added to the curriculum in Spring 2003. Enrollment in both courses has been growing.

The CEE Department is a corresponding member of the ASCE Body of Knowledge committee.

FACULTY

Professor Frank Falcone, AAP, P.E., and Captain, U.S. Naval Reserve (retired) has been selected by the U.S. Department of State to be a William C. Foster Fellows Visiting Scholar for the 2004-2005 academic year for a one-year assignment. The purpose of the visiting scholars program, named for William C. Foster the first Director of the US Arms Control and Disarmament Agency, is to give specialists in the physical sciences and other disciplines from faculties of recognized institutions of high learning an opportunity for active participation in the arms control, nonproliferation and disarmament activities of the State Department and to enable the Department to gain the perspective and expertise that such individuals can offer. Since the program began in 1984, more than 55 visiting scholars have served as Foster Fellows.

Dr. Shawn Gross received the Farrell Award at the Dean's Awards Banquet in May. The award is given to a professor who demonstrates personal concern and exceptional dedication to the College as determined by the students. The students noted Dr. Gross's high standards, "colorful" notes in the classroom, and his devotion to extracurricular work such as the Honduran trip and advising the Engineers Without Borders group.

Dr. Chiu Liu was appointed Associate Editor of Journal of Materials in Civil Engineering and is a Committee Member of ACI 555 on Concrete with Recycled Materials and TRB AFD20 on Pavement Monitoring, Evaluation, and Data Storage. Dr. Chiu is one of the invited speakers at the First International Conference on Highway Widening, organized by Jiangsu Institute of Transportation (China), Headquarters of Hu-Ning Freeway Construction, and NACOTA (North America Chinese Overseas Transportation Organization).

Dr. Emily Parkany has co-authored "Are Attitudes Important for Travel Choices" to be published by *Transportation Research Record, A Journal of the Transportation Research Board*. She also presented "Seasonality of Transportation Data: A Comparison of Four Data Sets" co-authored with Whitney Madron, CE '04, and related to FHWA-funded research at Eirass: Moving Activity Travel Approaches to Practice in Maastricht, the Netherlands.

Dr. Robert Traver has co-authored a paper, "A Watershed-Scale Evaluation of a System of Stormwater Detention Basins," with **C. Emerson (Ph.D. candidate)** and C. Welty. This paper has been accepted for publication in the *ASCE Journal of Hydrology*.

Dr. Andrea Welker is a member of the Education Committee of the United States Universities Council for Geotechnical Education and Research.

Electrical and Computer Engineering

FACULTY

Dr. Robert Caverly attended the 2004 IEEE International Microwave Symposium in Fort Worth, Texas in June where he presented a paper titled "Distortion Modeling of PIN Diode Switches and Attenuators." He co-chaired a session at the conference on "HF, VHF and UHF Technology Advances," as well as served as a judge for the Student Paper Competition. Later that same month, he attended and presented a paper at the 2004 American Society of Engineering Education Conference in Salt Lake City titled "Introducing Undergraduate Research Results in RF Microelectronics into the Undergraduate ECE Curriculum." Another paper was presented by Dr. Caverly's graduate student, **James Reifsnyder, EE '03**, in September at the 5th Topical Meeting on Silicon Monolithic Integrated Circuits for RF Systems in Atlanta. This paper titled "Modeling and Characterization of Integrated Inductors and Transformers for Amplifier Applications in Silicon High Frequency Systems" was co-authored by Villanova students **Sean Pearson, EE '04, Tim Walsh, EE '04, James Reifsnyder, EE '03, Jane Hall, EE '03**, and **Jeffrey Cotton, EE '03**.

Dr. Bijan Mobasseri hosted a 4-member delegation from Air Force Research Laboratory (AFRL), Rome, New York. The team was presented with plans and presentations to successfully carry out the project they are funding to develop algorithms for digital watermarking of compressed image and video. Presentations were also made by Dr. John Johannes, Vice President for Academic Affairs; Dr. Barry C. Johnson, Dean of the College of Engineering; Dr. Edward V. McAssey, Interim Chair of the Electrical and Computer Engineering Department; and Dr. Moeness Amin, Director of the Center for Advanced Communications. A tour of the facilities concluded their visit.

Dr. Pritpal Singh received a patent titled "Integrated Micropower Supply." This patent describes a unique power supply entirely manufactured in silicon to supply power to remote, autonomous sensors. Co-inventors are: Dr. Rodney M. LaFollette of Bipolar Technologies, Inc. and Dr. David Reisner of US Nanocorp, Inc.

Dr. Singh presented a paper titled "Fuzzy Logic-Based Modeling of 125Ah Valve Regulated Lead Acid (VRLA) Batteries" at the International Telecommunications Energy Conference held in September 2004 in Chicago. Co-authors were: **Sanjay Kaneria, MSEE '04**, John Broadhead, John Burdick, **Xiquan Wang, MSEE '01**, and David Reisner.

Dr. Singh received funding of $15,000 from U.S. Army/Picatinny for his project *Accurate Angular Position Sensor* to investigate various efficient methods of solving the transmission equation for two antennae.

DEPARTMENT NEWS

Mechanical Engineering

FACULTY

Dr. Hashem Ashrafiuon was awarded the National Academies/NRC Faculty Research Fellowship at the Air Force Research Lab's Space Vehicle Directorate in Kirtland Air Force Base, NM for the summer of 2004.

Dr. Amy Fleischer received a grant from the Pennsylvania Infrastructure Technology Alliance (PITA) for $34,775 for her work on the topic "Experimental Characterization of a Unique Carbon Fiber Brush Heat Sink in Two-Phase Heat Transfer."

Dr. Fleischer presented two papers at the 2004 International Mechanical Engineering Congress and Exposition in Anaheim in November. The papers are: "Thermal Characterization of an All-Active Microring Resonating Laser," co-authored with U. Troppenz, M. Hamacher and W. John; and "Experimental Investigation of Heat Transfer from a Discretely Heated Protruding Pedestal to a Single Round Impinging Air Jet," co-authored with S.R. Nejad.

Dr. Kei-Peng Jen and **Dr. Chiu Liu, CEE**, presented a paper at the 17th Annual ASCE Engineering Mechanics Conference held in June 2004 at the University of Delaware. The title of the paper is "Relationship between Concrete Strength and Fractal Dimensions of Fractured Concrete Surfaces." Two engineering graduate students, **Dexiao Hao, ME**, and **Matthew Marchisello, CEE**, are co-authors of this paper.

Dr. G. F. Jones co-authored with graduate student **Saba Ghassemi** a paper entitled "Thermal Optimization of a Composite Heat Spreader." It was presented by Ghassemi at the 2004 Heat Transfer/Fluids Engineering Summer Conference in Charlotte, North Carolina. Dr. Jones also co-authored with colleague R. J. Parise a paper "Prototype Data from the Nighttime Solar Cell" which was presented at the 2004 IECEC Conference in Providence, Rhode Island.

Professor William C. Koffke, PE, served as Program Chair for the Freshmen Programs Division of ASEE at the annual conference in Salt Lake City in June 2004. Professor Koffke is the division chair for this academic year.

College Grad Returns to Join the Faculty

Michael Raulli, Ph.D.

Michael Raulli, CE '00, returned to Villanova this semester. He is an assistant professor in the Department of Mechanical Engineering. After completing his bachelor degree in civil engineering, Dr. Raulli pursued a Ph.D. in aerospace engineering at the University of Colorado at Boulder where he researched the analysis and optimization of micro-scaled devices that are actuated with electrostatic forces. These devices have many applications in the fields of medicine and communications.

Raulli says: "Being a new faculty presents a whole new set of challenges that make my Ph.D. seem simple. However, the opportunity to teach young minds everyday is what makes it worth the effort. Some days, they even seem like they don't mind being in class. I am excited to be back at Villanova, teaching mechanical engineering; and I look forward to a long tenure in the College of Engineering."

Thermal-Fluid Research Team Formed

Dean Barry C. Johnson, Drs. Amy Fleischer, G.F. Jones, ME, Edward V. McAssey, Jr., Interim Chairman, ECE, and **Dr. Randy Weinstein, CHE**, have formed a team for collaborative research in Thermal-Fluid Sciences. The team is known as the Villanova Thermal Management Lab or NovaTherm. Dr. Fleischer serves as director of the facility.

NovaTherm addresses issues of research and development in the field of thermal management of electronic devices, components, systems and packaging technologies. The thermal management of electronics is one of the most significant design issues in electronic packaging today as increased device performances create higher heat loads in smaller device footprints. Insufficient heat removal leads directly to elevated operating temperatures, which in turn leads to reliability issues including catastrophic failure of the device.

NovaTherm, formally established in 2004, draws on the expertise of the five professors' more than 85 years of experience in the thermal management field.

Currently, NovaTherm is working on more than a dozen projects with such sponsors as the National Science Foundation, Office of Naval Research and the Pennsylvania Infrastructure Technology Alliance. Applications are in the fields of advanced and microelectronics, biomedical, and aerospace fields. Current active research topics include both experimental and numerical studies.

Faculty Publications

Ashrafiuon, H., and Irwin, R. S., (2004) "A Sliding Control Approach to Underactuated Multibody Systems," *Proceedings of the American Control Conference*, June 30 – July 2, 2004, Boston, MA, pp. 1283-1288.

Dinehart, D. W. (2004) "Supplemental Damping in Woodframe Structures," *Proceedings of the NSF Housing Research Agenda Workshop*, Eds. Syal, M., Mullins, M., and Hastak, M., Vol. 2, Orlando, Florida, February.

Dinehart, D. W., Shenton III, H. W. and Carlson, S. (2004) "Stiffness and Energy Degradation of Walls Constructed with Green Lumber," *Proceedings of the 8th World Conference on Timber Engineering*, Lahti, Finland, June.

Dinehart, D. W., Hoffman, R. M. and Sekin, A. A. (2004) "Viscoelastic Hold-down Device for Wood Shear Walls," *Proceedings of the 8th World Conference on Timber Engineering*, Lahti, Finland, June.

Dinehart, D. W., Joye, D. D. and Mendoza de Gonzalez, E. (2004) "Viscoelastic Polymers Improve the Cyclic Performance of Wood Connections," *Proceedings of the 8th World Conference on Timber Engineering*, Lahti, Finland, June.

Dionisio, M., Hoffman, R. M., Yost, J. R., Dinehart, D. W. and Gross, S. P. (2004) "Determination of Critical Location for Service Load Bending Stresses in Non-Composite Cellular Beams," *Proceedings of the 18th ASCE Conference of Engineering Mechanics Division*, Newark, DE, June.

continued on next page

FACULTY PUBLICATIONS *continued*

Duran, M. and Tepe, N. (2004) "Co-Digestion with Waste Activated Sludge for Improved Methanogenesis from High Solids Industrial Waste," *Environmental Technology*, Vol. 25, No. 8, pp.919-927.

Duran, M. and Chadderton, R.A. (2004) "Preparing Engineering Students for a Future in Anaerobic Digestion," *Biocycle: Journal of Composting and Organics Recycling*, Vol. 45, No. 7, pp. 55-56.

Duran, M. and Tepe, N. (2004) "Anaerobic Digestion of High Solids-Containing Wastes: Estimation of Kinetics," *Proceedings of the 10th Annual Industrial Wastes Technical and Regulatory Conference*, August 22 - 25, 2004, Philadelphia, PA.

Elahinia, M. H., Ahmadian, M. and Ashrafiuon, H. (2004) "On the Design of Extended Kalman Filter for Rotary Shape Memory Alloy Actuators," *Smart Materials and Structures*, vol. 13, no. 4, pp. 691-697.

Gross, S. P., Dinehart, D. W., Yost, J. R. and Theisz, P. M. (2004) "Experimental Tests on High Strength Concrete Beams Reinforced with CFRP Bars," *Proceedings of the 4th International Conference on Advanced Composite Materials in Bridges and Structures*, Calgary, Canada, July.

Hennessey, J., Hoffman, R. M., Dinehart, D. W., Gross, S. P. and Yost, J. R. (2004) "Effect of Cope Geometry on the Strength and Failure Behavior of Open Web Expanded Beams," *Proceedings of the 18th ASCE Conference of Engineering Mechanics Division*, Newark, DE, June.

Singh, P., Fennie, C. and Reisner, D (2004) "Fuzzy Logic Modeling of State-of-Charge and Available Capacity of Nickel/Metal Hydride Batteries," *Journal of Power Sources*.

Syed A., Hashsham, S.A., Alm, E. W., Stedtfeld, R. D., Traver, R. G. and Duran, M. (2004) "Detection and Occurrence of Indicator Organisms and Pathogens," *Water Environment Research*, Vol. 75, No. 6.

Tepe, N. and Duran, M. (2004) "Inhibition of Anaerobic Transformation by Electrophilic Thiol-Reactive Compounds," *Proceedings of the 10th World Congress on Anaerobic Digestion*, August 29-September 2, 2004, Montreal, Canada.

Traver, R., Welker, A., Emerson, C., Kwiatkowski, M., Ladd, T. and Kob, L. (2004) "Villanova Urban Stormwater Partnership: Porous Concrete," *Stormwater*, Vol. 5, No. 5, pp. 30-45.

Weinstein, R., Fleischer, A., Khobragade, S.A. (2004) "Forced Convective Cooling of Electro-Optical Components Maintained at Different Temperatures on a Printed Circuit Board," *IEEE Transactions on Components and Packaging Technologies*, v. 27, p. 296.

Weinstein, R., Fleischer, A. and Krug, K.A. (2004) "Natural Convection and Passive Heat Rejection from Two Heat Sources Maintained at Different Temperatures on a Printed Circuit Board," *J. Electronic. Packaging*, v. 126, p. 14.

Weinstein, R. and Moriarty, J. (2004) "Effect of Fractional Fluorination on the Properties of ATRP Surface-Initiated Poly (hydroxethyl methacrylate) Films," *J. Phys. Chem. B.*, 2004, v. 108, p. 9787.

Welker, A.L. and Tymon, W. (2004) "An Integrated Plan for Improving Team Functioning," *The Proceedings of the ASEE Annual Meeting*, Salt Lake City, June 2004.

Welker, A.L. and Finley, C. "Student Views of the *Geo-Industry*," *Geo-Support 2004*, ASCE GSP 124, pp. 1027-1037; also a condensed form appeared in *Geo-Strata, Summer 2004, Geo-Institute of ASCE*, pp. 10-14.

Yost, J. R., Gross, S. P., and Dinehart, D. W. and Mildenberg, J. (2004) "Structural Retrofit of Concrete Flexural Members using Near Surface Mounted CFRP Reinforcement," *Proceedings of the 4th International Conference on Advanced Composite Materials in Bridges and Structures*, Calgary, Canada, July.

Yost, J. R., Dinehart, D. W. and Gross, S. P. (2004) "Strength and Design of Open Web Steel Joists with Crimped-End Web Members," *Journal of Structural Engineering*, Vol. 30, No. 5.

STUDENT NEWS

- **Nalan Tepe, CEE**, a graduate assistant advised by Dr. Metin Duran, was the first place winner of the national Graduate Division Student Technical Paper Competition of ASCE/EWRI. She presented her work "Anaerobic Digestion of and Industrial Waste with High Solids Content: Effects of Co-Digestion with Waste Activated Sludge" during the World Water and Environmental Resources Congress, Salt Lake City, UT in June 2004. Tepe received a cash award of $500 from ASCE. In addition to this recognition, Tepe is the 2004 recipient of the Air and Waste Management Association Graduate Student scholarship of $2,000 awarded for recognition and continuation of her work on FAME profiles of biomass as indicator of microbial community structures of biological treatment processes.

Nalan Tepe

- **Berat Haznedaroglu, CEE**, a graduate assistant advised by Dr. Metin Duran, was the third place winner of the national Graduate Division Student Technical Paper Competition of ASCE/EWRI with his work "Fatty Acid Methyl Ester (FAME) Profiling for Microbial Source Tracking: Theory and Applications." Also, Haznedaroglu was the winner of the Pennsylvania Water Environment Association's 2004 Research Award. He presented his work on microbial source tracking during PWEA Technical Conference in State College in June 2004.

Berat Haznedaroglu

continued on next page

STUDENT NEWS *continued*

- The CEE senior design group GreenAcres won the national 2004 Parsons Brinkerhoff Capstone Design Contest of ASCE/EWRI. The team, **Lauren A. Zuravnsky, Christopher J. Gelardo (project manager), Rachel B. Greengas, Amy E. Sfara, and Gregory J. McDermott**, presented their design work "Waste Digester for a Chester County Farm" during the World Water and Environmental Resources Congress, Salt Lake City, Utah, UT in June 2004. The group's work was judged by numerous professors from around the country and by engineers of Parsons Brinkerhoff. The team received a $1,000 cash award from ASCE The team is pictured with ASCE President Bill Henry and EWR President Tom Rachford. Dr. Metin Duran advised the group.

GreenAcres: l to r.: B. Henry, L.Zuravnsky, C. Gelardo , R. Greengas, A. Sfara, G. McDermott, T. Rachford

- **Jason Reither, CEE '04**, was named a 2004 Star Student by *CE News*. He was one of forty students from universities around the country profiled in the December 2004 issue of the magazine. In July, Jason received the 2004 AISC Klingelhofer Fellowship. This is the second consecutive year that a Villanova student has won this prestigious award. Reither is enrolled in the five year BS/MS program and is conducting experimental and analytical research on castellated steel beams.

- **Hyung E. Jung, ME '06** and **William B. Serencsits, ME '05**, were chosen by the Scholarship Selection Committee of ASME's Board on Engineering Education as recipients of ASME foundation scholarships, each valued at $1,500.

- **Amy E. Cavanagh, ME '05**, and **Laura Ledgerwood, ChE '05**, have been selected by the Association of Independent Colleges & Universities (AICUP) as recipients of Air Products & Chemicals scholarships, each valued at $5,000.

- **David Bridge, ME '08**, was awarded a $5,000 ASME-ASME Auxiliary FIRST Clarke Scholarship in recognition of his participation in FIRST (For Inspiration and Recognition of Science and Technology), a multinational robotics competition.

CONCRETE CANOE SINKS THE COMPETITION

The Glory team at the Regional Competition
l. to r. standing: Michael Huber, Liz Gaynor, Craig Curtis, Liz Kenyon, Jessie Olownia, Catherine McGrath, Matthew Wellner, James Reifsnyder; sitting: Prof. Frank Falcone, James Troise, Sean Pearson, and Erin Vogel

The University's American Society of Civil Engineers Concrete Canoe Team won *First Overall* in the 2004 Pennsylvania-Delaware Annual Regional Competition held in April at Penn State University with their boat named *Glory*.

The competition requires that a concrete canoe be designed and built to certain specifications; that a paper detailing the construction, funding and project management of the program be written and submitted for judging; that a presentation be given to a board of judges and that the canoe passes a 'swamp test' (it must float when filled totally with water); that it be judged for durability and esthetics; and that the ASCE students race it. There are two male races, two female races, and two coed races. The Delaware Region is particularly competitive with many universities producing and racing highly excellent canoes each year.

This victory represents a substantial achievement for our students. The program is fully student-run. They design, build and race their own canoe; they raise the funds, write the paper, prepare and give the presentation and use their own innovations to try to win. The current team is comprised of civil, mechanical and electrical engineering students further increasing the College's focus on interactive education.

ASME NEWS

The Villanova chapter of the American Society of Mechanical Engineers (ASME) and the Villanova Robotics Club hosted the second annual BeetleBots Competition last spring. The 8 ft. x 8 ft. steel and lexan arena housed three-pound fighting robots from Villanova and Drexel Universities. It was a successful competition, and it is expected that the arena will be the location of many future competitions.

Participants at second annual BeetleBots Competition demonstrate the dimensions of the new lexan arena

The next competition, scheduled for late fall, will be the BeetleBots' first high school competition. The group hopes to make this contest an annual event to expose younger students to robotics and to introduce them to Villanova's College of Engineering.

The third annual collegiate competition will take place in the spring of 2005.

Corporate Sponsors Award Scholarships

For the second year, **Conti Enterprises,** Inc. has offered its annual scholarship and internship opportunities to Villanova students. The Conti Enterprises Scholarship program provides two $7,000 scholarships and a paid summer internship to qualifying Civil and Environmental and Mechanical Engineering students. **Madeline Flynn, ME '06**, and **Brian Sensi, CEE '06**, have been named the scholarship winners for the 2005-2006 academic year. An internship has been extended to **Garrard Esposito, ME '06**. Student recipients were selected through a competitive process including a GPA of 3.0, a letter of applicable credentials, and resume, culminating in an on-campus personal interview with a representative of Conti Enterprises. 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 and power. **Kurt Conti, CE '84**, President and CEO, serves on the College of Engineering Advisory Council.

Lockheed Martin Management and Data Systems (M&DS) awarded five Villanova students, including **Ross Martin, ECE '06**, with its Edward Reese Fellows Scholarships and Internships on October 10, 2004. The Edward Reese Fellows program provides $2,000 scholarships to undergraduate students majoring in electrical engineering and computer science. The awards include a paid summer internships with Lockheed Martin in Valley Forge. Students submitted for Lockheed's consideration a resume, transcript, and a letter indicating why they were an appropriate fit for the scholarship. Lockheed Martin Corporation researches, designs, develops, manufactures, and integrates advanced technology products and services. Lockheed Martin established the five-year Fellows Program in 2000 to provide recognition to individuals of the M&DS technical community whose significant achievements and unique talents reflect their commitment to integrity and excellence. **Mr. Edward Reese** is a 1959 graduate of the College of Engineering. To date, the 20 former Edward Reese Fellows have accepted full-time employment with Lockheed Martin.

Michael Baker Corporation held a luncheon at the Villanova Conference Center on Nov. 9 to honor its 2003-2004 Villanova student scholarship recipients, **Stephanie Gilpin** and **Kathleen Halcovage, CEE '05**. Dean Barry Johnson welcomed the students, representatives of Michael Baker Corp., and the College of Engineering. **Donald Fusilli, Jr., Esq. CE '73**, President and Chief Operating Officer and member of the College of Engineering Advisory Council, congratulated the students, including **Laura Ledgerwood, ChE '05**, a student whom Fusilli met at a reception for the College of Engineering Advisory Council and later offered a summer internship. Ledgerwood extended the summer internship with Michael Baker to work virtually. The Michael Baker scholarship provides two $1,000 awards toward university tuition and fees. The scholarship is offered through the Association of Independent Colleges and Universities of Pennsylvania (AICUP) to promote the engineering profession to individuals from groups historically under-represented in Engineering. Student recipients were selected through a competitive process including full-time undergraduate status as a junior majoring in Civil or Environmental Engineering and a GPA of 3.0. During the luncheon, Michael Baker Corp. presented a $10,000 contribution, the first of five installments toward improving education in Civil Engineering.

Alumni News

61 **Anthony J. Cavanna, ChE,** was recently elected to the board of directors of Ultralife Batteries, Inc. in Newark, NY.

67 **Richard Seibel, EE**, is the 2004 section chair for the Institute of Electrical and Electronics Engineers Palm Beach section, which has 1,000 members in the area.

79 **Robert Hill, ME**, is vice president and general manager of the Maryland business unit at McClendon Corp. in Jessup, MD, where he is responsible for providing engineering support and technical assistance to the National Security Agency.

James King, Esq., CE, is a 20-year active duty and Air Force Reserve JAG officer. He is in Iraq where he procures supplies and services to rebuild the country.

80 **Justin Noll, ChE**, a former Navy officer, has been promoted to plant manager of the Merck & Co. Cherokee plant in Danville, PA.

81 **Gregory R. Liebert, ME**, is founder/president of Vermont's Alternative Energy Corp. in Williston. He leads the effort in New England and beyond to provide environmentally friendly replacements for diesel fuel and heating oil.

82 **Luke Imperatore, ME**, is managing director in the alternative investments group at Putnam Lovell NBF Securities Inc. in New York.

83 **Christine Volkay-Hilditch, P.E., DEE, CE**, was elected to serve as the President of the Pennsylvania Water Environment Association (PWEA) at its recent annual conference. She is the first woman elected President in the seventy-eight year history of PWEA. Volkay-Hilditch is a member of the Water Environment Federation and the National Society of Professional Engineers, as well as past president of the Eastern Pennsylvania Wastewater Operators Association.

85 **Ben Marino, EE**, is the branch manager of Irwin Mortgage Corp. in Bridgewater, NJ.

Scott Robik, EE, became vice president of Credit Suisse First Boston after returning from a three-year assignment in Japan.

88 **LT Susan McCann Mercurio, USN, ME**, is stationed with the U.S. Coast Guard Group in Philadelphia. LT Mercurio has received numerous awards in her career, including the Navy Marine Corps Commendation Medal, the Joint Service Achievement Medal, the National Defense Service Medal, and the Armed Forces Reserve Medal.

Mark Fung, '88 ME, '98 MME, project manager at FMC Technologies in Chalfont, PA has been promoted to commander in the Naval Reserve.

89 **Joseph A. Trinkle, '89 CE, '98 MBA**, has been named vice president and city manager of Liberty Property Trust's Michigan region. He was formerly director of development for Liberty's Lehigh Valley, PA office.

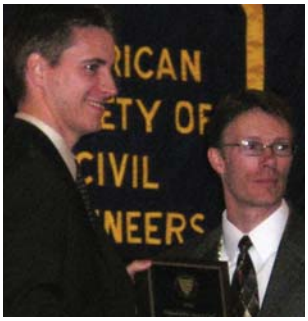
90 **Michael Julian, EE**, who holds an MBA from Arizona State University, has been promoted to director of sales, North America, at Catapult Communications Corp in Raleigh, NC.

94 **Charles C. Morganson, CE**, is a project engineer with Washington Group International, where he is in charge of drainage design for the Bay Area Rapid Transit (BART) subway extension from Fremont to Warm Springs, CA.

continued on next page

ALUMNI NEWS

ALUMNI NEWS *continued*



95 **Michael McAtee, CE**, has been named by the Philadelphia Section of the American Society of Civil Engineers as the 2004 Philadelphia Young Civil Engineer of the Year. The award was presented to McAtee at the section's annual Spring Social and Dinner Dance on May 7, 2004. McAtee was cited earlier this year as the Delaware Valley Young Engineering of the Year.

96 **LT Megan Robertson Reardon, USN, ME**, is NROTC advisor to freshmen at the University of San Diego and San Diego State University.

97 **Michael C. Heyer, EE**, earned a Master's Degree in Electrical Engineering from Polytechnic University, Brooklyn, NY. He is currently an engineer with KeySpan Energy, Highsville, NY, in the System Control and Protection Engineering Department.

98 **CPT Stephen Wisniew, USA, CE**, is stationed at Fort Bragg, NC, with the 307th Engineer Battalion, supporting the 82nd Airborne's 2nd Brigade. He had previously spent three years in Vicenza, Italy, with the 173rd Airborne Infantry Regiment.

00 **LTJG Wyatt B. Smith, USN, EE**, is stationed aboard the USS Philadelphia in Groton, CT. The submarine finished a seven-month extended deployment to the Mediterranean and the Middle East, making history as the first Los Angeles class submarine to achieve 1,000 successful dives.

02 **David Quinn, ME**, was awarded a National Defense Science and Engineering Fellowship.

Lalith Kumas Seetharaman, MSEE, is currently working in the field of ASIC verification at Tata Elxsi Ltd. in Bangalore, India.

03 **2nd Lt. Nicholas Pistun, USMC, CE**, is stationed at Quantico, VA.

ENS Courtney Haas, USN, CE, shifted homeports from San Diego to Japan.

Chakradhar Pulamarasetty, MSEE, is employed as a product design engineer for PMC-Sierra in Allentown, PA.

Srinivas Vatti, MSCPE, is currently working as a hardware design engineer for Unisys.

04 **Maxwell Funk, ME**, received an Army Officer's Commission as a Second Lieutenant of Field Artillery on May 14, 2004. He is currently attending his Officer Basic Course at Fort Sill, OK and will report to the 10th Mountain Division (Light Infantry) at Fort Drum, NY in December.
Mary

"Mamie" Lynch, CE, was awarded the Delaware Valley Engineer's Week Council Engineering Student of the Year Award.

NOTEWORTHY

The 96th graduating class of the College of Engineering received their degrees on May 16, 2004. At the Hooding Ceremony on May 15, one graduate from each program was recognized for academic performance and meritorious service: **Timothy A. Walsh, EE, Robert J. Stackhouse, CPE, Andrea M. Braga, CE, Sarah D. Banas, ME**, and **Nicholas J. Falco, ChE** (not pictured).

2004 Medallion Recipients with Dean Barry Johnson

CAREER SERVICES FOR ALUMNI

The Career Services Office assists alumni as well as current students. It's easy to use the services without visiting campus because the employment services are managed electronically. Experience/eRecruiting is Villanova specific software, which allows alumni to view and apply for available positions, and to upload their resumes into a Web Resume Book. Each job seeker has an individual secure account to enter data and upload resumes. There is also an employer database with contactinformation.

The service is free of charge and is renewable each year. For more information, visit the Career Services website at www.careers.villanova.edu. A link to Alumni Services is on the left. Because alumni have different job search needs, we're happy to offer advice about the best way to use the system. E-mail questions should be directed to kathleen.bracken@villanova.edu or call 610-519-4060.

Alumni can also access the system as employers. If you are in a position to hire a student or fellow alumnus, please call Carol Lloyd 610-519-4061.

LOOKING AHEAD

Planning committees are forming to celebrate the **100th Anniversary of the College** during the 2005-2006 academic year.
There will be many opportunities for alumni and friends to volunteer and participate in the various events.
Watch this space and the web for the latest information.

Inaugural Hooding Ceremony

On May 15, 2004 the College of Engineering held its first annual Hooding Ceremony. The event began with an academic procession in which the NROTC color guard, two bagpipers, and Dean Barry C. Johnson led the faculty and graduating bachelors and masters degree candidates into the Grotto where family and friends were seated.

Highlights of the ceremony included an invocation by Dr. Beth Hassel of Campus Ministry, an address by Michael B. Walsh, CHE, the winner of the College's Student Speaker contest, individual presentation of the appropriate hood to each of the candidates by Dean Johnson and Department Chairmen, award of the Departmental Medallions by Department Chairmen, congratulatory remarks by Dean Johnson, reading of Engineers Creed by all graduates, and a Benediction by Dr. Hassel.

The ceremony concluded with an academic recession. Following the recession, class pictures were taken on the Chapel steps, and were mailed to the graduates as a gift from the College of Engineering.

Photos by Legacy Photographics

College of ENGINEERING
VILLANOVA UNIVERSITY

VILLANOVA UNIVERSITY
College of Engineering
Villanova, PA 19085-1681

EAS Membership Drive

Reminder to all EAS members: The membership year renewed on September 1. If you need to renew your one-year membership, please do it online today! You can also check the status of your membership online.

NOT A MEMBER YET?

Why not join the organization that gives back to the Villanova Engineers? To date, we have given over $100,000 of your membership dues back to students in the following areas:

- Scholarships
- Grants
- Student Project Support
- College Support

Visit us online and join today. Your membership makes a difference in the lives of today's Villanova Engineering Students!

http://engineering.villanova.edu/eas

Send your news to
THE FINAL DRAFT
at egr.thefinaldraft@villanova.edu