



College of  
**ENGINEERING**  
VILLANOVA  
UNIVERSITY

# THE FINAL DRAFT

VILLANOVA UNIVERSITY

## COLLEGE OF ENGINEERING

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EXCELLENCE

INNOVATION

INTEGRITY

### MESSAGE FROM THE DEAN - DR. BARRY JOHNSON

As a new spring envelops us, the College continues to strengthen and grow in many ways. Innovative academic programs are being introduced, leading-edge research is expanding, and infrastructure is improving. I'm consistently amazed and gratified at the talent, commitment and productivity of our students, faculty, staff and alumni.

In the last Newsletter I mentioned that as we continue on this exciting journey, I would solicit particular input and advice from external stakeholders. To this end, I am pleased to

announce the appointment of the first College of Engineering Advisory Council. The charter of the Advisory Council is to (a) review and critique the strategic plan of the College, (b) identify trends in the engineering profession and their impact on the College's educational programs, (c) assist in the development of networks and partnerships, (d) act as advocates (both internally and externally) for the College, and (e) monitor the progress of the College in executing to the strategic plan.

Currently, the Council membership includes: Steve Andriole, Labrecque Professor of Decision & Information Technologies, Villanova; James Birle, ME '58, Chairman, Resolute Partners LLC; Joan

Chrestay, Associate Dean for External Relations, College of Engineering; Donald Collins, Executive Director, NAVSEA Philadelphia Carderock Div.; Kurt Conti, CE '84, CEO, Conti Enterprises; Joseph Denny, EE '68, Director of Strategic Initiatives, Liberty Property Trust; James Eastwood, CE '68, President & CEO, Granary Associates; Dr. Richard Emmert, retired Vice President, E.I. DuPont; Donald P. Fusilli, Jr., Esq., CE '73, President & CEO, Michael Baker Corp.; William O'Donnell, CE '65, President, O'Donnell & Naccarato; Thomas Portland, ChE '69, retired Vice President, Air Products & Chemicals; John Robins, CE '70, President, SMI Joist Company; Frank Ryan, ChE '53, retired COO, Air Products and Chemicals; William Wiggenhorn, retired Chief Learning Officer, CIGNA; Dr. Simon Thomas, Director, Director, Semiconductor Research Corp.; and Dr. Karl Wyatt, Vice President, Engineering & technology, High Speed Solutions, Intel Corp. Tom Portland and Joan Chrestay have agreed to serve as Chair and Secretary of the Council, respectively.

The Council has met twice since December, 2003 and will continue to meet a minimum of two times per year. This is a very accomplished group of alumni and friends, and I am confident their individual expertise and collective wisdom will allow the Council, as a consultative body, to provide significant guidance and support to the College.

Another exciting topic that I'd like to highlight is the University's approval of the College's new entrepreneurial Distance Education Program.

Distance Education is a key component in our strategy to increase graduate enrollment by providing M.S. degrees and customized educational programs on-line. Under Sean O'Donnell, Director of Distance Education, significant technical upgrades have been made to our existing classroom in CEER 010 and two new state-of-the-art distance education classrooms are under construction in CEER 312 and 314. The first fully on-line M.S. degrees in Civil and Environmental Engineering were offered in the fall of 2003. As a result of the favorable response, we will also be offering an on-line M.S. in Mechanical Engineering this fall. The current plan is to introduce M.S. programs in Electrical, Computer and Chemical Engineering in succeeding fall semesters.

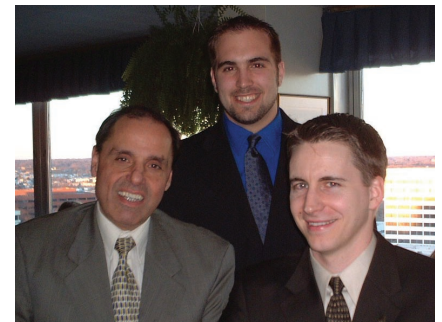
Lastly, spring also signals the impending graduation of our current senior class. The events surrounding graduation, such as the Dean's Awards Dinner, Hooding Ceremony, Baccalaureate Mass and University Commencement, provide beautiful backdrops for the College's faculty, staff and administration to continually reflect on our fundamental mission: to provide our students with the best learning experience possible while at Villanova, and to prepare our students to be successful in whatever careers they may choose in life after Villanova. Considering our proud tradition of producing exceptional alumni, we feel a profound sense of satisfaction in our mission, and the College of Engineering Class of 2004 can feel confident that they too will succeed.

### DELAWARE VALLEY YOUNG ENGINEER OF THE YEAR

**Mike McAtee, CE '95**, has been named as the 2004 Delaware Valley Young Engineer of the Year. He received the award at the Engineers Club of Philadelphia Annual Dinner on February 25, 2004. This award, initiated to acknowledge the merits and continuing accomplishments of young professionals in engineering, is a prestigious highlight of the Engineers Week activities.

McAtee, a project engineer at Urban Engineers, graduated from Villanova with an undergraduate degree in Civil Engineering in 1995. He is currently pursuing a graduate degree at

Villanova. Since his graduation, McAtee has distinguished himself both technically and managerially at Urban Engineers. In addition, he is active in the American Society of Civil Engineers (ASCE) Younger Members Forum encouraging young people to seek an engineering career. McAtee has also become a steady and unwavering spokesman for the profession throughout the Delaware Valley, meeting with youth groups and introducing the engineering profession as a lasting, valuable and satisfying career.



Seated l. to r.: Prof. Frank Falcone, CE, and Mike McAtee. Standing: Robert Guinivan, CE '06

## EXTERNAL RELATIONS EFFORTS EXPANDED IN THE COLLEGE



*l. to r.: Melanie Terburg, Assistant Director for External Relations; Joan F. Chrestay, Associate Dean for External Relations; and Andrew Baumbach, Director of Development*

The College of Engineering welcomes Joan Chrestay, Associate Dean for External Relations; Melanie Terburg, MPA '02, Assistant Director for External Relations; and Andrew Baumbach,

Director of Development. Chrestay and Terburg are part of the newly launched Office of External Relations. Baumbach, a senior fundraiser in the Office of University Development, is assigned to the College of Engineering under the new distributive fundraising model.

The Office of External Relations was created to intensify the focus on external linkages for the College. The goal is to enhance and expand multi-faceted partnerships with foundations, corporations, other universities, and government agencies in support of the College's Strategic Plan. Fundraising efforts will be focused on the operational needs of the College by building on the existing relationships of the College, as well as new opportunities.

The College is also committed to actively participating in fundraising activities spearheaded by the Development Office, as part of University's capital campaign, *Transforming Minds and Hearts: The Campaign for Villanova*.

Baumbach will work with Dean Barry Johnson, to expand major gifts support through linking the interests of individual alumni, parents, and friends to the priorities of the College.

Chrestay and Terburg come to Engineering from the Development Office, where they worked on engineering priorities. In her new role, Chrestay is a key figure working with the dean, College administration, and faculty to bring in direct funds and other resources in support of the education and research objectives of the College. She will also work closely with the members of the College Advisory Council, where she serves as Secretary, to accomplish the College's fundraising objectives.

Terburg manages the communications, research, and stewardship for corporate, foundation fundraising activities. She also cultivates institutional relationships with corporate and foundation funders.

## W.M. KECK FOUNDATION GRANT FOR STRUCTURAL ENGINEERING LABORATORY EQUIPMENT

The W.M. Keck Foundation recently made a \$500,000 grant award to Villanova University's College of Engineering for equipment to enhance the Structural Engineering program. The grant from the Keck Foundation supports the College's five-year strategic plan which includes the construction of a new Structural Engineering Laboratory. This laboratory will house the equipment made possible through the Keck grant, supporting an innovative undergraduate curriculum designed by principal investigators Shawn Gross, Dave Dinehart, Joseph Yost, and Rebecca Hoffman. The grant was initiated by Joan Chrestay, new Associate Dean for External Relations in the College, and former Director of Corporate, Foundation and Government Relations for the University.

"Our commitment to strengthening Villanova's Structural Engineering program is reflective of the national increases in the enrollment in Civil Engineering," Dean Barry Johnson said. "The new lab will significantly enhance the ability of the Villanova Structural Engineering faculty to fully integrate modern research into the undergraduate educational experience." The laboratory will also be available for graduate and faculty research.

A state-of-the art structural engineering laboratory will make the structures team more competitive for both private and public grants.

"Many engineering construction firms within the tri-state region are run by Villanova alumni and one of the largest civil engineering firms in the country is run by an alumnus," Johnson said. "We will now have the capacity to respond to their research needs, while preparing our students for the workforce they will be entering."

The University's Department of Facilities Management has approved construction of the Structural Engineering Laboratory to begin in August 2004. The College has already secured \$2.4 million of the projected cost of \$2.8 million, consisting of \$1.7 million for the building and \$1.1 million for equipment. The building is scheduled to open in June 2005. The Keck award will help the University attract other private donors for the capital cost of the laboratory.

The grant from the prestigious W.M. Keck Foundation will also advance the College's efforts to attract other financial support via its newly established Office of External Relations.

The W.M. Keck Foundation is a private, grant-making foundation. Among its purpose and activities, the foundation provides grant funding to strengthen programs at accredited universities in the areas of engineering and science.

### NEWSLETTER STAFF

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## PA DEPUTY SECRETARY OF WATER MANAGEMENT VISITS VILLANOVA

Cathy Meyers, Deputy Secretary of the Office of Water Management for the Pennsylvania Department of Environmental Protection attended a special research board meeting of the Villanova Urban Stormwater Partnership (VUSP). The purpose of the VUSP is to advance the field of stormwater management through demonstration, technical transfer and education.

After an introduction by the VUSP director **Dr. Robert Traver, MCE '82**, the attendees went on a tour of the Villanova University Stormwater Best Management Practice Demonstration Park featuring the stormwater best management practices on campus. At each site graduate students updated the board with the latest performance data being collected for that site. **Jordan Ermilio, ME '97, MSWREE '05**, spoke to the Deputy Secretary about the performance and effectiveness of the Bio-Infiltration Traffic Island on the university's west campus. **Matthew Rea, A&S '00, MSWREE, '04** addressed the

tour on recent water quality data being analyzed at the Stormwater Wetlands (behind the Law School), while graduate students **Michael Kwiatkowski** and **Tyler Ladd, both CE '02, MCE '04**, led the tour at the Porous Concrete Infiltration Basin.

Following the tour, the board met and discussed some of the future endeavors of the VUSP to include a proposed study on several 85 – 100 year old seepage pits recently rediscovered in front of Tolentine Hall. The Deputy Secretary's visit was a complete success and she expressed praise over Villanova's activities.

The Villanova Urban Stormwater Partnership started as a joint effort between Villanova University and the Pennsylvania Department of Environmental Protection. Starting in December, industrial members have been invited to join. To date Cahill Associates, Delaware River Basin Commission, McCormick Taylor, and O'Brien & Gere have joined as partners or



Photo by John Welsh and the Office of Communications and Public Affairs

*l. to r.: Deputy Secretary Cathy Myers, Jordan Ermilio and Dr. Robert Traver at VU BioInfiltration Traffic Island, West Campus*

members and were represented at the meeting. For more information and results from our research in stormwater visit our website at <http://www.villanova.edu/VUSP>.

## LATEST RESEARCH DEVELOPMENTS PRESENTED AT CAC ANNUAL CONFERENCE

The Center for Advanced Communications (CAC), College of Engineering, hosted its Annual Meeting on Oct. 9, 2003. The day began with an introduction given by **Dr. Moeness Amin**, director of the CAC, followed by welcoming remarks delivered by the **Rev. Edmund Dobbin O.S.A.**, president of the University and **Dr. Milton T. Cole**, the University's assistant vice president of academic affairs for research. Throughout the duration of the day, presentations were given by University faculty and postdoctoral colleagues on the CAC's current research developments.

"The primary goal of the CAC is to facilitate the transformation of knowledge into innovations that will create new wealth and strengthen a community," Amin asserted. "We hold these meetings to present our research activities and findings to our current sponsors and to seek opportunities to work together with potential new sponsors."

Cole's remarks focused on the University's primarily undergraduate populace: "Villanova has a stated purpose and a strategic plan in its mission statement on concentrating on the education of undergraduates. Through the resources

of groups like the CAC this mission has evolved."

After the presentations, attendees toured the research labs in the Center for Engineering Education and Research (CEER).

The Annual Meeting featured technical presentations given by **Drs. Fauzia Ahmad, Moeness Amin, Robert Caverly, Ahmad Hoorfar, Gerard Jones, Bijan Mobasseri, Wei Sun, Randy Weinstein,** and **Yimin Zhang**. These presentations were in the areas of Wireless Communications, Anti-Jam GPS, Space-Time Coding, RF Microelectronics in Communication Systems, Sensor Array Processing, Radar Imaging, Secure Communications, and Thermal Management and Heat Transfer.

In attendance were representatives from more than 35 government agencies, industry and academic institutions including Air Force Research Lab, Naval Surface Warfare Center Carderock Division, Office of Naval Research, PECO Energy Company, Boeing Company, Concurrent Technologies Corporation, BAE Systems, Lockheed Martin, Lafayette College, and University of Pennsylvania.



*Dr. Moeness Amin, Director of the CAC and Professor of Electrical and Computer Engineering*



*Dr. Milton T. Cole, University Assistant Vice President of Academic Affairs for Research and Sponsored Projects*

Photos by Paula Ngatens - Courtesy of Office of Communications and Public Affairs

## ENGINEERING SERVICE TRIP TO AMIGOS DE JESUS, HONDURAS



*Sunset after a long day's work*

There was once a young boy who was walking through the town, naked, beaten and starving. He was mocked and ridiculed until one person said, "look for the cross on the hill and there you will find hope."

The site of this cross is at Amigos de Jesus, a boy's home in

Santa Barbara, Honduras, and the hope that the town person was talking about is most definitely found there. As soon as you step inside the gates of Amigos you are welcomed into a world of caring, love and hope. This holds true not only for homeless or starving children, but also for those who visit this oasis.

Over this past spring break, Civil Engineering students **Andrew Blasetti, Liza Dhamer, Carolyn Conlee, Dennis Stefanski, Jim Sutton, Liz Kenyon, Jim Troise, Jeff Cook, and Robert Guinivan;** Mechanical Engineering students **Sarah Banas and John Boring; Melissa Guinivan, CE '01;** and Civil Engineering professors **Dr. Shawn Gross and David Dinehart** made a trip to Amigos de Jesus as part of a service

learning experience. Incorporated into this trip were design proposals for a new school to begin construction next year and a solar panel design to provide power for the new water pump. Aside from the proposals the team got to do a little Honduran style manual labor as well. There is a new garden area being built so they got to dig, dig, dig, move some rocks, and then dig some more.

While many of the engineering skills that they learned during their time at Villanova were implemented on this trip, the part that they will remember most is the boys of Amigos de Jesus. There were love, compassion and happy atmosphere whenever the boys were around. They were a fun loving group that needed no more than each other to be happy. The games they played involved paper airplanes, tennis balls, soccer balls or simply their hands. The most amazing part of the trip was each night when the group gathered in a circle for night prayers and the boys were so thankful for all that they have



*Working hard moving tons of dirt*

been given. A lesson that the group learned was that it is not about materialism, but the community and happiness that they shared with one another. The boys at Amigos de Jesus have been given something that all of us were given when we were born, a reason to HOPE!!!



*One family - Villanovans and the boys of Amigos de Jesus*

## INNOVATIVE NEW MASTER'S DEGREE DESIGNED FOR PRACTICING ENGINEERS WITH AN EYE ON THE FUTURE

Acknowledging the need for engineers to embrace broad responsibilities in the 21st century and make significant technology decisions, the College of Engineering and the College of Commerce and Finance launched an innovative graduate degree for the Fall 2004 semester. The **Master of Technology Management (MTM)** is a cross-disciplinary program designed especially for practicing engineers. The curriculum is uniquely tailored for professionals who want to bridge the gap between engineering technology and management strategies to advance to leadership positions, and at the same time enhance their marketability. With a well-rounded education, graduates of the MTM Program will be truly ready to manage the challenges of information technology and most importantly, provide innovative solutions to both clients and employers.

The distinct and customized program, using a cohort of students, fosters a flexible and stimulating learning environment without interrupting job responsibilities. Combining expertise from the business and engineering faculty, the curriculum allows MTM students to specialize in chemical, civil, computer, electrical, or mechanical engineering tracks while learning the latest management techniques and business skills. Students

graduating from the program will have the knowledge of advanced business functions, a first-hand look at global business through an international travel experience, and 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 any of the engineering disciplines.

Dr. Barry Johnson, Dean of the College of Engineering, initiated the MTM Program. It was motivated by employer surveys, student feedback, and an expressed need for a broad-based and forward thinking Master's degree. By advancing engineering knowledge, gaining project management skills, and tackling information technology issues confronting businesses, graduates with a MTM will have the ability to make a difference in leading people, organizations, and technology.

The MTM Program joins other successful Villanova Graduate Business and Engineering Programs. For more information on the MTM or any of the Graduate Programs, please contact us at 610-519-6959 or link to [www.engineering.villanova.edu](http://www.engineering.villanova.edu).

## ENGINEERING ASSESSMENT TRIP TO WASLALA, NICARAGUA

This past March an assessment team went to the central mountains of Nicaragua to evaluate the feasibility of incorporating international development projects into the undergraduate senior design curriculum. The group was composed of two engineering professors, **Dr. Gerard Jones, ME Chairman** and **Mr. James O'Brien, ME**, graduate student **Jordan Ermilio, ME '97, MSWREE '05** and **Joseph Dietzel, ME '04**. The group was mandated with the task of identifying potential water resource development projects in low-income rural communities and building relationships with local partners and organizations in Waslala, Nicaragua. The group was also asked to determine the potential for incorporating multidisciplinary engineering projects which could entail coordination amongst engineering students from different departments.

Upon arriving in the capital city of Managua, the team immediately began traveling north through the Central Cordillera Range to the town of Waslala, approximately eight hours north of Managua. Waslala is a small mountainous town with little access to the basic needs of water, sanitation, roads or electricity. Approximately 8000 people live in the town center with roughly 30,000 inhabitants residing in hundreds of small villages throughout the surrounding mountains. It is in these rural outskirts where the lack of minimum basic needs is most critical. With little access to education and no available infrastructure such as

roads, these communities are completely isolated from the outside world. In fact, during the majority of the 10-month rainy season, access from these areas to the town center itself is completely cut off. This ultimately leaves the people with no health clinics of any kind during periods of outbreaks of diarrhea, dysentery and malaria; all preventable water born diseases.

Whereas the entire municipality of Waslala is in need of infrastructure development, the rural outskirts have no development funding for such work. The town center, on the contrary, is currently being administered by a municipal government which is still in its primary stages of establishing itself. Thus, with no outside support, the rural villages outside of the town center are left in total isolation. It is also these areas which present the most interesting and logistically challenging engineering problems for potential undergraduate design teams.

During this evaluation trip, the assessment team conducted elevation and source assessments for seven water supply projects. Of these sites, one was an ongoing project implemented by the municipal government for the town center. Two of the assessments were completed projects funded by the local church and Villanova students who had previously visited this area. One assessment was of a system in need of rehabilitation, one assessment was being proposed as an extension, one source was undeveloped and another was for the town hospital. All of these sites exhibited good potential for students' design projects, however the feasibility of using electrical engineering applications is still being evaluated. The remainder of this trip was spent coordinating and building relationships with local partners and community groups. The assessment trip was largely successful and all persons involved

expressed a profound interest in pursuing future relations with the community of Waslala, Nicaragua.

At the present time, the Mechanical Engineering department is in the process of designing a program which will allow senior design teams to travel to these communities. This program will give students an opportunity to assess, design and build water resource development projects in communities which currently have no potable drinking water supplies. Students will work side-by-side with local community partners and will learn first-hand applications of engineering principals studied in Villanova's engineering curriculum. Senior design teams who choose to work on these issues will also receive classroom based coursework which details the complex issues of international development as well as how



*Dr. Jones with children of Arena Blanca*



*Villanova Assessment Team with the residents of El Guabo*

they apply to the context of the situation in Nicaragua. The CEE department is also considering involvement in this program which would allow multidisciplinary collaboration.

The department would like to sincerely thank the Engineering Alumni Society for funding the students involved with this trip. Also, anyone who is interested in learning more about this program can contact [Jordan.Ermilio@villanova.edu](mailto:Jordan.Ermilio@villanova.edu). Donations for supporting projects associated with this program can be sent to EAS.

## NOTEWORTHY

Villanova University has been named by The Princeton Review as No. 8 among "The Top 25 Most Connected Campuses." To identify colleges on the list, The Princeton Review collated responses from more than 100,000 college students, as well as data from campus administrators. Criteria included the student/computer ratio, wireless access on campus, and comments from students and administrators.

It is with great sadness  
that we announce the passing of  
**Dr. S. S. Rao,**  
Professor and Chairman,  
Electrical and Computer Engineering  
who departed this life on April 22, 2004.

## ECE PROFESSOR HAS ROLE IN SMOKE DETECTOR DESIGN

**Professor Edmond J. Dougherty, ECE**, was a key member of the design team for an important new type of smoke detector. As featured in *Fortune Small Business* magazine's November 2003 issue, the KidSmart™ Vocal Smoke Detector was designed specifically for children. University studies have shown that existing smoke detectors do a poor job of waking sleeping children. The studies indicate that it is not a matter of the volume of the alarm, but rather that the sound is not recognized by the sleeping child.

To solve this problem, the KidSmart™ detector combines the functions of a standard smoke detector with a low power digital voice recorder. The product allows a parent to provide the children with a message specifically recorded for them and for the fire alarm situation. For example, Mary's mother might record the following message..."Mary wake up, this is Mom. There is a fire in the house. Go down the back steps like we've practiced and I will meet you across the street at the Jones' house." This message when alternated with the standard smoke detector horn awakens the child, orients the child to the situation, provides instruction on how to act in the emergency situation and provides the comfort of a familiar voice.

In December 2003 the system was presented with the "Best of What's New" award from *Popular Science* Magazine. The design was showcased at the 2003 Consumer Electronics Show in Las Vegas where it won the "Best of Innovations" awards. These awards are given to products that have been deemed revolutionary in their respective fields. The product was featured on Good Morning America, CNN, NBC, the Paul Harvey Radio Network and the AP Wire. The system is currently being evaluated for additional awards by many well-respected organizations throughout the world. For more information see [www.kidsmartcorp.com](http://www.kidsmartcorp.com).

## ME GRAD REVOLUTIONIZES MOUNTAIN BIKING



Steve Christini, ME '95

**Steve Christini, ME '95** is founder and president of Christini Technologies Inc., the world's leading developer of All Wheel Drive (AWD) mountain bikes. This successful manufacturing company began with a thought Christini had in the summer of 1994. Could powering both wheels of a mountain bike improve traction to prevent slippage on wet or muddy terrain? Christini, along with **Mike Dunn, ME '95**, tackled the problem as their senior capstone design project. With time, investment and much hard work, their research and design led to the founding in 1999 of Christini Technologies Inc. The company now holds six US and international patents on the technology.

The Christini bike uses a shaft drive system that enables smooth shifting between the rear and front wheels to increase control, stability and traction. A switch mounted on the handlebars controls the AWD clutch. If the rear wheel slips on wet or muddy ground, power shifts to the front wheel. Likewise when the front wheel decelerates, power is transferred from the rear wheel to the front gaining traction control. The bikes are hand-built at the company's facilities at 421 N. 7th Street in Philadelphia. Christini bikes are now distributed in eleven countries as far away as New Zealand and are available at many local bike shops. The company has also developed the world's only shaft drive All Wheel Drive motorcycle and is currently in discussions with five major international companies to bring this technology to market. For more information, see their website at [www.christini.com](http://www.christini.com).

## VILLANOVA CENTER FOR THE ENVIRONMENT (VCE)

The Consortium for Sustainable Design and Research of Southeastern Pennsylvania, comprised of VCE, Philadelphia University, Temple University, and Ben Franklin Partners of Southeastern Pennsylvania, received \$1 million for the first year of funding from the Pennsylvania Department of Community and Economic Development. The VCE researchers in the Consortium are **Drs. Rominder Suri (CEE), Pritpal Singh (ECE) and Chiu Liu (CEE)**. The Consortium promotes and advances green initiatives such as environmentally benign waste treatment technologies, use of recycled materials, alternative energy technologies and efficiency, and plant life to construct new buildings and communities in order to preserve the environment, save money, and create safe and pleasant working and living environments.

The Community and Economic Development secretary Dennis Yablonsky said, "This integrated team of inventors, researchers, and designers will help regenerate the environment, preserve energy resources, and spur the development of a new green economy for Southeastern Pennsylvania." He noted that the Consortium's multi-university, interdisciplinary research team supports Governor Edward G. Rendell's technology-focused economic development strategy. "The combined efforts of the

Consortium will stimulate regional industries, leverage private and federal research dollars, and help local companies expand their business and create the adoption of green initiatives," Yablonsky said.

### Other recent VCE Grants/Awards

**Dr. Rominder Suri**, *Fate and Analysis of Natural and Synthetic Estrogenic Hormones in Wastewater*, additional funding of \$90,000 by Wyeth Pharmaceutical.

**Drs. Robert Traver and Andrea Welker**, *Radnor Infiltration Trench*, PA Department of Environmental Protection, \$39,300.

**Dr. Robert Traver**, *Urban Stormwater BMP Monitoring*, PA Department of Environmental Protection, \$46,110.

**Dr. Pritpal Singh**, *Fuzzy Logic-based Portable Defibrillator Battery Meter*, National Institute of Health/Nanocorp Inc., \$225,000.

**Dr. Pritpal Singh**, *Miniature Hybrid Power Supplies for Enclosed Spaces*, Phase II, US Army/Bipolar, \$196,263.

For more information on how your organization could benefit from Center activities and on how to participate, contact Dr. Rominder Suri at [rominder.suri@villanova.edu](mailto:rominder.suri@villanova.edu).

# ENGINEERING CENTERS

## CENTER FOR ADVANCED COMMUNICATIONS (CAC)

The Center for Advanced Communications (CAC) is currently involved in numerous research projects with various government and industrial partners including DARPA, NSF, AFRL, BFTP, and The Boeing Company.

### CAC Grants/Awards

Additional funding received for research projects:

**Dr. Moeness Amin** received \$30,000 for the continuation of the grant *Signal Processing Techniques for Anti-Jamming GPS Receivers* from the AFRL/IFB. This project continues to explore new anti-jamming techniques for GPS receivers.

**Drs. Robert Caverly, Moeness Amin, and Ahmad Hoorfar** received an additional \$11,250 of the funding for the grant *Curriculum Development in Systems for Smart Communications* from the National Science Foundation.

**Dr. Ahmad Hoorfar** received a grant in the amount of \$37,180 for *Squire Antenna Test* from DRS Technologies.

**Drs. Moeness Amin and Ahmad Hoorfar** received \$11,000 funding from Ablaze Systems LLC/Ben Franklin Technology Partners (BFTP) for *Antenna Modeling and Indoor Signal Fading Simulations for the Radiotronic Chip Central Unit in Restaurant Applications*.

### Director's News

As a Distinguished Lecturer of the IEEE Signal Processing Society, **Dr. Moeness Amin** traveled over the period of March 1-13, 2004 to Southeast Asia and Australia, where he gave fourteen invited talks in Singapore; Johore and Kuala Lumpur in Malaysia; Perth, Canberra, and Melbourne in Australia. The talks were given at 10 different Academic Institutions and Research Centers. This trip was utilized to promote the CAC, the Engineering College, and Villanova University in this part of the world. Prior to this trip, Dr. Amin traveled to Cairo, Egypt in late December where he gave an invited talk at Cairo University on Blind Adaptive Wireless Channel Equalization.

Dr. Amin was the Plenary Speaker at the IEEE Symposium on Signal Processing and Information Technology, held in Darmstadt, Germany in December 2003.

In Spring 2004, Dr. Amin published 3 journal papers and 7 conference papers. These publications are co-authored by his colleagues, postdoctoral fellows and graduate students.

### NATO Panel on TWRI

Dr. Amin was invited to attend the NATO meeting on Through-the-Wall Radar Imaging (TWRI) held in France during March 24-26, 2004. The meeting was attended by representatives from Germany, Greece, Netherlands, Italy, Canada, France, and the United States. At the meeting, he presented the recent advances made by the CAC in the TWRI area. At the conclusion of the meeting, the CAC was chosen to represent the US on the NATO Task Force and Exploratory Team in Through-the-Wall Imaging.

### National Science Foundation – Partnership for Innovation

The Center for Advanced Communications (CAC) has been awarded a National Science Foundation grant of \$600,000 over three years. The grant is to establish a Partnership for Innovations and Technology Transfer in Wideband Wireless Technologies. Villanova University partners include one university, two government labs, the Commonwealth of PA represented by Ben Franklin Technology Partners, two community colleges, one high school, and nine large and small corporations. The professors involved are Drs. Moeness Amin, Sohail Chaudhry, Amy Fleischer, Ahmad Hoorfar, Barry Johnson, and Randy Weinstein. The NSF grant covers the research areas of Signal Processing, Antennas, and Thermal managements.

### DiGiacomo Scholarship

The Center for Advanced Communications (CAC) is pleased to award the Joseph DiGiacomo Scholarship to **Brian Anderson, EE '05**. The Scholarship was established in memory of Mr. DiGiacomo, the Founder and the former Director of the CAC. Mr. DiGiacomo believed that for the Center to accomplish its mission, it must develop a nurturing and creative environment in advanced communications education and research that will help, serve, and guide students linking them to the industrial community.

Brian will be given the opportunity to participate in one of the on-going research CAC research projects and will receive a summer internship at the CAC and a stipend during his senior year.

### Memorandums of Understanding (MOUs)

Dr. Moeness Amin has established two MOUs between the CAC and two research entities in Singapore and Australia. The CAC signed an MOU with the Centre for Signal Processing and the Positioning Wireless Technology Centre in Singapore. Another MOU was also signed with the School of Engineering & Mathematics, Edith Cowan University in Australia. These MOUs will allow the parties to share real data in GPS, Imaging, and wireless communications.

## CENTER FOR NONLINEAR DYNAMICS & 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 National Science Foundation, W. M. Keck Foundation, SMI Steel Products, Ford Motor Company, High Concrete Structures, Inc., Materials Sciences Corporation and Ben Franklin Technology Partnership.

### Activities

**Dr. C. Nataraj**, the director, made presentations on the Center activities and had discussions on collaborative projects with NAVSSES (Philadelphia), Office of Naval Research, Rockwell Automation and Sperry Marine Corporation (Northrop Grumman). He was also invited to a special panel discussion on science and technology aspects of homeland security with DHS officials at the office of the National Academy of Engineers. Dr. Nataraj participated in discussions with the program manager of Fraunhofer Institut (IZM, Berlin, Germany) to work out a collaborative research agreement on projects of mutual interest scheduled to start in June 2004.

### Grants for Research Projects

Newly funded projects include the following:

**Drs. Joseph Yost, David Dinehart and Shawn Gross** were awarded \$122,160 from SMI Joist for *Structural Performance of Prefabricated Steel Joists and Castellated/Cellular Beams*. The award includes funding for experimental investigation, analytical study, and internship opportunities for Villanova students at SMI facilities. Graduate and undergraduate student involvement will be a significant aspect of the partnership.

**Drs. C. Nataraj and Rebecca Hoffman** received a grant of \$11,000 from BFTP for *Conceptual Design of Mechanical Couplings for Stainless Steel Pipes*.

**Drs. Shawn Gross and Joseph Yost** received a grant of \$6,350 from High Concrete Structures, Inc. for *Instrumentation of a 15-foot Wide Double-Tee at High Concrete Structures, Inc.*

### Grants for Facilities

#### Structures Lab

The \$500,000 award from the W. M. Keck Foundation, in combination

*continued on next page*

**(CENDAC)** *continued*

Masters student Justin Delecki inspects the sampling heads of the newly commissioned Fast Gas Analyzers from Combustion Ltd, UK

with a \$250,000 grant from the National Science Foundation will help to fully equip the new Structural Engineering Teaching and Research Laboratory that will open in June 2005. The grants will be used to purchase several major equipment items, including a complete MTS dynamic hydraulic loading system comprised of a high-flow 60 gpm pump, several actuators of various capacities, and control devices that allow for load-

controlled or displacement-controlled testing in static and dynamic configurations. Additional equipment to be purchased under the grants includes a universal testing machine and multiple high speed data acquisition systems, instrumentation components, and static testing devices.

This equipment acquisition will transform the undergraduate curriculum and research opportunities in structural engineering, by establishing a learning environment that incorporates cutting-edge research practices into the undergraduate educational experience. The equipment will be used in many new courses that will each have a unique laboratory component. Additionally, the equipment will provide undergraduate students, graduate students, and faculty with unique new opportunities to engage in active research projects involving the testing of steel, concrete, wood, and composite structural systems.

**Automotive Emissions Lab**

Ford Motor Company has donated to the CENDAC Automotive Research Group led by **Drs. James Peyton Jones, ECE**, and **Ken Muske, ChE**, a used Horiba MEXA 1100 NO analyzer for use in the Automotive Emissions laboratory. The analyzer, which would cost approximately \$140,000 new, has a fast response time of less than 30ms and can therefore be used to study the dynamics of exhaust after-treatment systems. The aim of the research is to measure, model and control the dynamics of these systems in order to reduce harmful emissions from the tailpipe.

The Automotive Research group has also been commissioning much of the equipment purchased under a \$320,000 grant from the National Science Foundation. This includes a full suite of fast response gas analyzers for transient measurements of CO, CO<sub>2</sub>, HC, NO, and H<sub>2</sub> in the exhaust as well as a rapid prototyping system so that advanced engine control and diagnostic strategies can be readily implemented and tested on a real engine. The new systems mean that the facility is now truly world class in the field of dynamic emissions measurement, modeling and control, and it places Villanova at the forefront of ongoing research in this area.

**CIVIL AND ENVIRONMENTAL ENGINEERING****FACULTY**

**Dr. Ronald Chadderton** published a paper titled "Should Civil Engineers Study Economics and Risk" in the *ASCE Journal of Professional Issues in Engineering Education and Practice*.

**Prof. Frank Falcone, BCE '70, MCE '73**, has been invited to participate in an inter-college research grant provided by the U.S. Department of Education to the Villanova Latin American Studies Program dealing with the development of interactive Sustainable Development initiatives with organizations in Costa Rica and Chile.

The grant includes the development and presentation of four international workshops to be held at Villanova over the next two years as well as the development of a three credit undergraduate course to be offered in the College of Arts & Sciences which will be open to all undergraduates.

**Drs. David Dinehart, Shawn Gross, and Joseph Yost** were co-authors of four publications in 2003 related to their collaborative efforts in concrete research: "Shear Strength of Normal and High Strength Concrete Beams Reinforced with GFRP Bars" and "Time-Dependent Behavior of Normal and High Strength Concrete Beams Reinforced with GFRP Bars Under Sustained Loads" in *ASCE Special Publication, High Performance Materials in Bridges and Buildings*; "Flexural Stiffness of High Strength Concrete Beams Reinforced with GFRP Bars" in *American Concrete Institute (ACI) Special Publication 210: Deflection Control for the Future*; and "Effective Moment of Inertia for GFRP Reinforced Concrete Beams" in *ACI Structural Journal*. Drs. Shawn Gross and Joseph Yost, in conjunction with Lafarge North America, hosted a one-day workshop in January on "Aggregates and Admixtures for Concrete." The workshop was attended by approximately fifty regional engineers and contractors active in concrete-related work.

**Dr. Andrea Welker** co-authored "The Calibration of a Flow and Transport Model with a Bench-Scale PVD Remediation System", published in the *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, and "Design of a Measurement Program of Bench-Scale PVD Systems Using Bayesian Updating" to be published in *ASTM Geotechnical Testing Journal*.

**CHEMICAL ENGINEERING****FACULTY**

**Dr. William Kelly** published the paper "Using CFD to Predict the Near-Impeller Behavior of Power Law Fluids in a Mixing Tank with Axial Flow Impellers in the Transitional Flow Regime" in *Chemical Engineering Science*.

**Dr. Edward R. Ritter** participated in two STAR Fellowship review panels held by the U.S. Environmental Protective Agency in Washington, DC in February 2004. The panel reviewed and ranked the research proposals of STAR Graduate Fellowship applicants in the areas of Atmospheric Chemistry and Environmental Engineering. The reviews done by these panels will be used to select the Graduate Research Fellowships to be awarded by the EPA.

**Dr. Randy Weinstein** published two articles based on his research into the uses of carbon dioxide as a solvent under supercritical conditions. Co-authors on these papers included graduate and undergraduate chemical engineering students along with his departmental faculty colleague **Dr. Kenneth Muske**: "Liquid and Supercritical Carbon Dioxide Loading into Chewing Gum Base" published in *Industrial and Engineering Chemistry Research*, with **Emily Cushnie, CHE '03** and **Thomas Kopec, CHE '03**; and "The Solubility of Benzocaine, Lidocaine, and Procaine in Liquid and Supercritical Carbon Dioxide" published in the *Journal of Chemical Engineering Data*, **Jeffrey Moriarty, CHE '02, MCHE '04**, and **Emily Schmidt, CHE '04**. **Dr. Weinstein** was also recently elected as Vice-Chair of the High Pressure group of AIChE. The group organizes twelve technical sessions at the annual AIChE meeting each year in the areas of supercritical fluids.



## ELECTRICAL AND COMPUTER ENGINEERING

### FACULTY

**Dr. Robert Caverly** was the co-chair of the HF, VHF, UHF Technology committee at the 2004 IEEE International Microwave Symposium (IMS) Technical Committee Meeting in Fort Worth, TX. His paper "Solid-State Amplification and Control Devices for High Power RF Applications" was accepted for publication in *IEEE Microwave Magazine*. His paper "Distortion Modeling of PIN Diode Switches and Attenuators" presented at the 2004 IEEE International Microwave Symposium has been accepted for publication.

**Dr. Ahmad Hoorfar** co-authored a paper with **John McVay, EE '01, MSEE '03**, and Dr. Nader Engheta of the University of Pennsylvania entitled "Applications of Hilbert Artificial Magnetic Conductor Ground Planes to Performance Enhancement of Electrically Small Antennas" at the 2003 IEEE Sarnoff Symposium. Mr. McVay presented the paper at the 2003 IEEE Sarnoff Symposium and won the student best paper award presented at the symposium. Dr. Hoorfar presented "Evolutionary Synthesis of Non-Uniform Partially Reflective Surfaces for Beam Shaping of Microstrip Antennas", co-authored with Dr. Engheta and **Jinhui Zhu, MSEE '03**, at the IEEE International Conference on Electromagnetics in Advanced Applications held in Turin, Italy in September 2003. Dr. Hoorfar's journal paper entitled "Electromagnetic Optimization Using a Mixed-Parameter Self-Adaptive Evolutionary Algorithm", co-authored with **Dr. S. Nelatury, ECE**, and J. Zhu, was published in the November 2003 issue of the *Microwave and Optical Technology Letters*. Dr. Hoorfar organized a special invited session on "antenna Systems: Novel Modeling and Optimization Techniques" at the 2004 IEEE Aerospace Conference held in March 2004 in Big Sky, MT.

**Dr. Mark A. Jupina** presented a paper entitled "Discrete and Complex Programmable Logic Device Circuit Projects for a Course in Digital Electronics" at the 33rd ASEE/IEEE Frontiers in Education Conference in November 2003 in Boulder, CO.

**Dr. Bijan G. Mobasser**, with **Domenick Cinalli, MSCPE '03**, presented "Reversible Watermarking using Two-way Decodable Codes" at SPIE Conference on Security, Steganography and Watermarking of Multimedia Contents VI, in January in San Jose, CA. At the same conference, Dr. Mobasser and Robert J. Berger presented "Reversible Compressed Domain Watermarking by Exploiting Code Space Inefficiency". In November Dr. Mobasser was the invited speaker at InterDigital Communications, King of Prussia, PA. The topic was novel applications of digital watermarking for wireless LAN security.

**Dr. Pritpal Singh** attended the IEEE Sensors 2003 Conference in Toronto in October 2003, chaired two sessions and presented a paper titled "Micropower Supply for Sensors." In November 2003, he participated in a planning workshop organized by the US Department of Energy titled "Systems-Drive Approach to Energy Storage R&D Workshop". Dr. Singh, along with C. Fennie and D.E. Reisner, were awarded a U.S. patent in December 2003 for "Method and System for Determining State-of-Health of a Lead-Acid Defibrillator Battery Using an Intelligent System."

## LOCKHEED MARTIN PROVIDES ECE WITH \$1.4 MILLION SOFTWARE PACKAGE

### ECE GRAD RECOGNIZED A WIN-WIN SITUATION

For the past several years, **Gerry Mayer, EE '73**, has shepherded an intelligent-agent development system called the Extendable Mobile Agent Architecture (EMAA) for Lockheed Martin Advanced Technology Laboratories (ATL) in Cherry Hill, NJ.

EMAA helps engineers forge new applications in fields such as artificial intelligence, data mining, and distributed processing. Lockheed Martin engineers have used EMAA to build over 25 research and development applications for the Defense Advanced Research Projects Agency and various military laboratories. The estimated cost for this one-of-a-kind tool is \$1.4 million.

As an alumnus and as an active member of the ECE Industrial Advisory Board, Mayer has keen insight into Villanova's needs and capabilities. By providing an EMAA license to Villanova University, Lockheed Martin has given professors and students a valuable tool to develop new applications and forge new paths in discovery – win number one.

As Director of the Artificial Intelligence Laboratory at ATL, Gerry knows that EMAA needs a large portfolio of applications and subsequent successes if it is to become a standard industry tool. Licensing the university helps contribute toward that goal – win number two.

## ECE ALUMNI MENTORING PROGRAM: A SUCCESSFUL YEAR

The ECE Alumni Mentoring Program paired 32 alumni mentors with the senior class of 2004. The program was started by two members of the ECE Industrial Advisory Board: Marie Maguire '69, a principal in Caramanico Maguire Inc, an engineering sales force and management development company based in Conshohocken, and Sam Brattini '63, a vice president at Kema Consulting, Inc.

During the Spring 2003 semester fifteen alumni mentors came to the campus to participate on panels with their proteges. In their discussions the mentors presented, from their own personal experiences, such topics as relocation due to job change and/or transfer; decision processes for career paths; job interviews; family vs. work priorities and decisions; management vs. technical design and implementation careers; downsizing and networking with the purpose of acquainting the students with various situations which may come up in their lives and different ways of proceeding. The experience was well received by the students; and the mentors expressed gratitude for the opportunity to return and give back to the University and the College of Engineering.

The mentors included George Alexander '69, Alex Baran '75, Tony Basilio '69, Heather Bernardin '95, Karin Borgersen '96, Geordi Borsari '87, Samuel Brattini '63, Merrill Buckley '49, Philip Bur '69, William Chriss '69, Bob DiRita '62, Edmond Dougherty '69, Patricia Dougherty '99, William Goble '88, John Happ '85, Michael Howe '70, Jim Hritz '85, Joseph Klisch '69, Carmen Laurelli '69, William Leighton '73, Bob Lisowski '72, Marie Maguire '69, Walt McDonald '89, Thomas McIntyre '69, Alan Morrison '69, Edward Reese '59, Glen Reitmeier '77, Colin Rice '69, Peter Sevcik '69, Alan Uszynski '93, Christine Wismer '83, and Veronica Wyrwas '67.

## GRANTS/AWARDS

**Dr. William J. Kelly, ChE**, received a grant of \$15,000 from Glaxo-SmithKline for *Quantifying the Extent of Detrimental Shear Effect on CHO Cells*. The grant will permit the building of a device for measuring the degree of “detrimental shear (laminar) effect” on cell breakage for typical animal cell. Dr. Kelly also received a grant of \$7,500 from Centocor for *Optimizing Filter Flow Distribution for Perfusion Culture of Mammalian Cells* to develop an optimal flow distributor for multi-cartridge filter housing.

**Dr. Metin Duran, CE**, and **Dr. Rebecca Hoffman, ME**, received a \$10,020 grant from Ben Franklin Technology Partners to work with Bestweld, Inc. on conceptual design and preliminary analysis of mechanical coupling devices for stainless pipes.

**Dr. Harry Dwyer, ECE**, received a grant of \$75,000 in network processor development tools from Agere Corporation, a developer of network related hardware and software. Only two other universities have received similar grants from Agere’s Research Group which promotes academic research in areas of corporate interest. The tools will be used by Drs. Dwyer, Kresch and Kulkarni in research on techniques to improve network processor and system performance and may support a future course offering.

## NOTEWORTHY

Dr. William J. Kelly developed and taught a new graduate Chemical Engineering course this past Fall: CHE 8589 – **Biochemical Engineering II**. During the course, the students learned about a variety of bioprocessing steps used to isolate and purify biological drug products such as antibiotics, proteins and antibodies. The steps included crystallization, extraction and chromatography.

## MECHANICAL ENGINEERING

## FACULTY

**Dr. Hashem Ashrafiuon** has been selected as Editor for Education of *IEEE Control Systems Magazine*.

**Dr. Amy Fleischer** gave an invited lecture at the 2004 Workshop on Thermal Management of Electronics at the Indian Institute of Science in Bangalore, India on January 2-3, 2004. She was one of five U.S. academics invited to speak at the workshop. Her participation in the workshop was funded by the NSF grant entitled “*International Thermal Science Group Travel to India to Participate in Research Workshops and the Sixth ISHMT-ASME Heat and Mass Transfer Conference*”. Dr. Fleischer is serving as the chair of the session “Passive Thermal Management of Electronics” at the 9th International Conference on Thermal, Mechanics and Thermomechanical Phenomena in Electronic Systems on June 2004 in Las Vegas, Nevada. This conference is sponsored by IEEE and ASME.

**Dr. G. F. Jones** participated in the Delaware Valley Young Inventors competition and presented an award at the ceremonies held January 31, 2004 at the Franklin Institute in Philadelphia.

MECHANICAL ENGINEERING STUDENTS  
WIN INTERNATIONAL COMPETITION

*Timm Strayer and Geoff Jung at the ASME International Competition*

**Timm Strayer, ME '05**, and **Hyung ‘Geoff’ Jung, ME '06**, are the winners of the 2003 ASME Student Design Contest, held at the 2003 International Mechanical Engineering Congress and Exhibition in Washington, DC in November, 2003. The competition included thirteen teams from universities in the United States and around the world. These teams had each won their respective regional competitions earlier in the year.

The challenge was to design a system that utilizes the gravitational potential energy stored in two liters of water to lift as much simulated ore as possible out of a simulated mine and deposit it into a receiving bin. Their winning design, *Moving On Up*, was the result of more than a year’s work.

Timm and Geoff are very active in the Villanova Student Section of ASME. Timm is the Immediate Past President; Geoff is secretary and webmaster.

Their accomplishment continues a fine tradition in the Mechanical Engineering Department of excelling at student competitions.

## SENIORS NAMED TO WHO’S WHO

Each year thousands of students across the United States are nominated for membership in Who’s Who in American and Universities Colleges. Of the group nominated a much smaller number is selected to membership in this prestigious organization.

Over the past forty years Villanova has used this award to recognize and honor students who, through their leadership ability, service to the Villanova community, and academic achievement have personified the values of Villanova University.

The students in the College of Engineering who were selected for membership and honored at the recognition dinner on January 30 are: Sarah Banas, ME; Daniel Borginis, CHE; John Boring, ME; David Carlberg, EE; Deepanjan De, EE; Joseph Dietzel, ME; Lisa Guinivan, CE; Mary Lynch, CE; Robert Stackhouse, CPE; and Michael Walsh, CHE.

## AIAA CHARTERED AT VU

Thanks to the efforts of **Sean Moynahan, ME '04**, a student section of the American Institute of Aeronautics and Astronautics has been chartered at Villanova. There are seventeen founding members. Officers are **Nick Zandonella, ME '05** Section Chair, **Mike Markey, ME '05** Vice Chair, and **Angela Hair, ME '06** Treasurer. The faculty advisor is **Dr. Charles Marston, ME**. Section activities have included trips to the American Helicopter Museum and the Mid-Atlantic Air Museum.

## KELLI BARBATO, ME '05

### IN THE SPOTLIGHT



When you are a senior in high school, you have two big decisions to make – which college to attend and what your career should be. It's one of the most stressful times in a student's life. I, on the other hand, always knew what I wanted to do – attend Villanova and become a mechanical engineer. I am reminded that it's not the engineering of choice for females every time I arrive for my classes and find I am one of five females. It has never bothered me though. With or without my degree, mechanical engineering has shaped my life in a very interesting way – through drag racing.

I have literally been at the racetrack since I was born. My dad has been racing for over thirty years. For me, racing is a family sport. Some families go to the shore on the weekends, we go to the track. I think it is the single most important link that has kept us together. Eleven years ago, the Junior Drag Racing League was created; and a year later, I became one of the original members. After winning the second race I entered, I was hooked and I never wanted to stop racing.

After eleven years, three wins, three runners-up, and a total of four different cars, racing is still my passion. Now at twenty-one, I am beginning the rebuilding of my second official race car – a 1968 Camaro SS with a 516cid Big Block Chevy which should be capable of quarter mile time of 10.40 seconds and a final speed of over 130 mph. I'll never forget the day I picked it up. I had a smile on my face from 4:00 AM when I woke up to midnight when I fell asleep; and that smile hasn't faded yet. Because I can't race the car until April, and being the mechanical engineering student that I am, I've decided to rip every

gadget, wire, sticker, gauge, button and hose out of the car and redo everything with the help of my dad. We're also

working with a chassis builder to get the chassis, suspension, and weight distribution perfect so I can have many fast and safe runs. I want a car I can be proud of.

Some people think that a drag race is just getting the car down the track as fast as possible. Well, it takes a lot to do that. Primarily race cars are engineered so that they don't break in half while accomplishing this. Also, there are some classes (such as the one in which I will compete) where winning a race is based on consistency rather than speed. To be competitive, I must be able to run as close to 10.90 seconds in a quarter mile without going under. Because my car will be capable of elapsed times of 10.40 seconds and of speeds over 130 mph, I will use a throttle stop. Thanks to some great engineering, the throttle stop has come a long way. Throttle stops slow the car down by closing the carburetor for a period of time so that it can only idle. The duration that the throttle stop is on is the variable. Crew chiefs need to be able to manipulate the throttle stop to thousands of a second to get the edge on the competitor in the other lane. This is where the statistical calculations that I learned in my Stress Analysis course are helpful.

Of course I can't do any of this without many, many people who have encouraged me, helped me and loved me. The three most important of these are my mom, dad and brother. If not for my mom and dad, I wouldn't be living this dream; and if not for my brother, I wouldn't have such a great racer to admire and emulate.



Kelli with her 1968 Camaro

## STUDENT NEWS

- Outstanding students from senior, junior and sophomore classes received awards from the AIChE Delaware Valley for their academic excellence: **Michael Walsh, CHE '04**, was recognized as Outstanding Graduate, while **Christopher Harley, CHE '05**, and **Elizabeth D'addio, CHE '06**, were named outstanding Junior and Sophomore respectively. The American Chemical Society Philadelphia Section presented its award for the outstanding Chemical Engineering graduate to **Nicole Sieller, CHE '04**, and the American Institute of Chemists presented its outstanding student award to **Monica Branco, CHE '04**.
- **Nicholas Falco, Michael Walsh and Daniel Borginis, CHE '04**, were awarded first prize in the Zeisberg Student Technical Writing Contest sponsored by the Delaware Valley Section of the American Institute of Chemical Engineers. The report, which investigated the fundamental principles of mass transfer in the absorption of a soluble gas (ammonia) in a liquid solvent (water), was judged on the basis of organization, accuracy, conciseness, clarity, grammar and general effectiveness. The contest is open to students in all chemical engineering programs in the Delaware Valley.
- **Michael J. Deitch, CE '05** and **Michael L. Illgas, CE '05** have been named the winners of the Conti Enterprises scholarships for the 2004-2005 academic year. The awards, funded by Conti Enterprises, Inc.; include summer internships with the firm as well as scholarships for senior year.
- **Michelle Dionisio, CE '03**, currently a graduate student, was awarded the 2003 Klingelhofer Fellowship from the American Institute of Steel Construction. This prestigious fellowship is awarded annually to a graduate student conducting research on structural steel. The winner is selected from a candidate pool from seventeen states. Michelle is conducting research on the structural analysis and design of SMI Smartbeams under the direction of **Drs. Rebecca Hoffman, ME**, and **Joseph Robert Yost, CE**. Her research is supported through the SMI Joist/SMI Steel Products – Villanova research partnership.
- **Stephanie Gilpin and Dennis Stefanski, CE '05**, and **Emily Dail CE'06**, were awarded 2004 Structural Engineering Summer Research Fellowships by the Department of Civil Environmental Engineering. These fellowships are supported through the SMI Joist/SMI Steel Products – Villanova research partnership and other grants.

## STUDENT NEWS *continued*

- **Michael Dion, ME '05**, has been accepted into the Los Alamos Nondestructive Testing program for a summer internship at Los Alamos National Laboratory, Los Alamos, New Mexico. The purpose of this program is to expose a select group of upper-level undergraduate students and first-year graduate students to the broad field of nondestructive testing and evaluation as applied to actual technical programs within the Laboratory. Under the guidance of mentors, students will be assigned to work in teams on one or two projects during the course of the summer. The student's goal will be to produce results and document their activities in a final technical report suitable for possible presentation at a future technical conference.
- **Sarah Banas, ME '04**, has achieved Honorable Mention in the National Science Foundation Graduate Research Fellowship competition. She has earned further distinction as the recipient of a National Defense Science and Engineering Graduate Fellowship to study mechanical engineering at the University of Illinois, Urbana/Champaign.
- Mechanical Engineering students excelled at the 2004 ASME Regional Student Conference held at the University of Rochester in April. The conference is an annual event attended by approximately 40 schools in the northeast section of the country. **Timm Strayer, ME '05**, and **Hyung "Geoff" Jung, ME '06**, placed first in the Student Design Contest. They were required to design and build a vehicle that could retrieve six simulated mines from a minefield and place them into a controlled receiving area within an allotted time of three minutes. Timm and Jeff had an outstanding design and beat all competitors by a comfortable margin. Their win allows them to compete in the 2004 National Contest in Anaheim in November. Ben Campanella, ME 04, finished in third place in the Old Guard Oral Competition with his presentation "A Vertical to Horizontal Transition System for U.S. Navy Cargo/Ordnance Elevator." Other members of Ben's senior design team include Tim Troy, Brian Griffin and Dan Ballister. Steve Miller, ME 04, won first place in the Technical Web Page Contest for his web page design on the "Iris Throttle".



*Geoff Jung and Timm Strayer with their winning design*

## ISPE, THE SOCIETY FOR LIFE SCIENCE PROFESSIONALS

ISPE is a world-wide, not for profit volunteer Society of technical professionals who apply their practical knowledge in the life science industries.

The Villanova University Student Chapter of ISPE, with **Dr. William J. Kelly, CHE**, as Faculty Advisor, **Mary Rose O'Connor, CHE '03**, now employed at Merck & Co. as Industry Advisor, and **Maria Cynthia Cordero, CHE '04**, as president, has had an active year.

**MadhavaRam Paranandi, MCHE '03**, winner in the ISPE Delaware Valley Chapter graduate and undergraduate student poster competition, attended the Annual Meeting held in New Orleans, LA in November, 2003 to present his graduate research poster "Predicting Particle Retention in Continuous Flow Centrifuges Using CFD", at the Annual ISPE International Student Poster Competition. Five seniors, **Monica Branco, Cynthia Cordero**, and **Cheryl Zarzycki, CHE**, along with **Alexandra Pulido, ME**, and **Justin Boland, A&S**, raised funds to attend the meeting as well.

Other events and activities include ArmChair Tour; INTERPHEX, the Annual Conference held in NY; and the DC Student Forum where students act as advisors giving ideas that could benefit future ISPE chapter.

Membership in ISPE provides students with exceptional educational programs, unique networking opportunities, and a promise of developing professional relationships within ISPE, as well as its affiliated industries.

## SHPE ATTAINS CHAPTER RECOGNITION

On December 11, 2003, the Society of Hispanic Professional Engineers (SHPE) officially recognized the Villanova student chapter. This was possible thanks to the efforts of the Dean, **Dr. Barry Johnson, ME '71**, SHPE advisor, and **Alexandra Pulido, ME '05**, president and founder.

SHPE enjoys a strong but independent network of professional and student chapters throughout the nation. SHPE welcomes students from any race and heritage and from any major.

## WE ARE INTERESTED!

Keep us informed about your activities,  
awards and accomplishments.

Send your information for publication to  
[egr.thefinaldraft@villanova.edu](mailto:egr.thefinaldraft@villanova.edu)

## ALUMNI NEWS

- 62 Casimir Skrzypczak, ME**, a general partner at Global Asset Capital, was named an independent member of the board of directors of Somera Communications in Santa Barbara, CA. He also serves on the boards of JDS Uniphase Corp., WebEx, ECI Telecom and Sirenza Microdevices and as a director at Polytechnic University.
- 70 John A. Janitz, ME**, has been appointed co-managing principal of Questor Management Company, a private equity firm in Southfield, MI, specializing in acquiring and turning around troubled companies. Janitz has been serving as chairman of Teksid Aluminum, which produces aluminum castings for the automotive industry. He holds an M.B.A. degree from Eastern Michigan University and is a graduate of the Harvard University Advanced Management Program.
- 70 Rick Fehl, EE**, the chief operating officer for AGL Networks, LLC in Houston oversees all business functions of the company's Atlanta and Phoenix dark-fiber networks. In addition to his Villanova degree, he holds an M.B.A. degree from the University of Pittsburgh.
- 73 John Arndt, EE**, is assistant chief engineer of Greater Media's Philadelphia Radio Group in Bala Cynwyd, PA. Greater Media operates four radio stations in Philadelphia: WMGK 102.9 FM, WMMR 93.3 FM, WMWX 95.7 FM and WPEN 950 AM.
- Donald P. Fusilli, Jr., Esq, CE**, president and CEO of Michael Baker Corp., an engineering and energy company in Moon Township, PA, has joined the board of directors of RTI International Metals Inc. He also serves on the boards of Robert Morris University, The Horticultural Society of Western Pennsylvania and Pittsburgh Vision Services.
- 77 William J. Schneider, CHE**, has been recalled to active duty with the Navy and is stationed at the Pentagon in Washington, D.C.
- 80 Lt. Col. James Doll, USMC, CE**, is serving at the Pentagon.
- 82 Byrne K. Mulrooney, ME**, is president of staffing services at Spherion Corp. in Fort Lauderdale, FL. Spherion provides recruitment, technology and outsourcing services with operations in North and Central America, Europe and Asia/Pacific.
- 83 James Ensell, EE**, has been appointed vice president of marketing at Virage Logic Corp. in Fremont, CA. He holds a master's degree in electrical engineering from the University of Pennsylvania.
- 87 John Dillon, EE**, is director, supply chain management, at Nordson Corp. in Westlake, OH. He holds an M.B.A. degree from John Carroll University.
- Lillian A. Dukes, MSEE**, has been appointed vice president of maintenance at Atlantic Coast Airlines in Dulles, VA. She is responsible for all elements of hangar and line maintenance for the company's entire operation.
- 89 LCDR Stephen P. Ryan, USN, CE**, is on assignment at Air Command and Staff College, Maxwell Air Force Base, AL.
- 90 Stephanie T. Hopper, ME**, a fluids and propulsion project manager at Boeing in Cape Canaveral, FL, received the American Society of Mechanical Engineers' 2003 Diversity and Outreach Award for outstanding work contributing to space flight and mission safety.
- LCDR John J. Keenan IV, USN, EE**, is supervisor of shipbuilding at the Pascagoula Naval Station in Mississippi.
- 93 LT George A. Walborn II, USN, CE**, a naval aviator, is stationed at the Naval Air Station North Island in San Diego.
- 94 Chuck Morganson, CE**, a project engineer for Washington Group International, is in charge of storm drainage design for the 5.4-mile extension of the San Francisco Bay Area Rapid Transit (BART) System from Fremont to Warm Springs, CA.
- 99 LTJG John W. Ryan, USN, CE**, is on active duty aboard the USS Harry S. Truman, out of Norfolk, VA.
- 00 1st Lt. Anthony Gibbons, USAF, EE**, is on active duty at Seymour Johnson Air Force Base, NC.
- 01 Daniel R. Sellers, EE**, received a master's degree in electrical and computer engineering from the University of California, San Diego.
- Huafeng Zhang, MSEE**, is currently employed by Adaptive Digital Technologies, Inc. as a DSP engineer.
- 02 2LT Suzanne Burkholder, USA, CPE**, completed the Engineering Officer Basic Course and is assigned as the environmental officer for the 36th Engineer Group at Fort Benning, GA.
- Orang Azgomi, MSEE**, is a design engineer for Altera Corporation in California.
- Ronald Bernot, MSEE**, was promoted to Engineering manager on January 1, 2004 at Intertek in Lexington, KY. Intertek is a Third Party Independent Testing Laboratory that specializes in evaluating Telecommunications equipment.
- Sangeetha Damodar, MSEE**, is currently working as a business analyst for Aetna US Healthcare in Bluebell, PA.
- James Jewson, MSEE**, is currently employed as an electrical engineer for Automation Products Inc. in Houston, TX.
- Colin Joye, EE**, is a graduate student at MIT. He and two other students, working as a team, won the 19th Annual TBII Engineering Design Competition at MIT with a "Coin Sorter" that perfectly sorted dimes, nickels, quarters and pennies – 100 coins in two minutes. The constraint of the competition was \$25 in materials. Colin also presented an invited poster and demonstration on "The Plasma Tweeter" at the 115th Audio Engineering Society Convention in New York City, October 2003, after publishing an article in the society journal on the same subject.

## ALUMNI NEWS *continued*

**03 David Quinn, ME '02**, has been awarded a National Science Foundation Graduate Research Fellowship to pursue doctoral studies. He is currently pursuing a Ph.D. at MIT after spending a year at the University of Cambridge researching nanotechnology as a Gates Cambridge Scholar.

**John Dawson, CHE**, who is currently studying for the doctorate at Carnegie Mellon University, was selected to receive a prestigious National Science Foundation Fellowship. Dawson is pursuing an unusual joint PhD degree in Chemical Engineering and Public Policy. John was awarded the Robert E. White Medallion as Outstanding Chemical Engineering Graduate by the Chemical Engineering Department and the first Robert D. Lynch Award as the outstanding graduate by the College of Engineering at the Villanova Engineering Alumni Association Awards banquet last June.

**Eddie Deegan, EE**, is the recipient of the annual B. Joseph Tofani Award, given to the men's lacrosse player with the highest academic average during his four year career. The award is given in memory of B. Joseph Tofani, ME '35. The presentation was made by Peggy Corrado, who is the daughter of Mr. Tofani and the mother of Michael Corrado, the defensive coach of the team.

**Robert Marx, MSCPE**, is currently working as a systems engineer for Lockheed Martin in King of Prussia, PA.

**Ramakrishna Pusuluri, MSCPE**, is currently working as a software engineer at Intellitrans LLC. In his spare time he plays cricket for the local league of the British Officers Cricket Club (BOCC), which tours all over the east coast and Canada.

## EAS MEMORIAL TO PROFESSOR RICH GATTI



*Plaque on tree planted in Professor Gatti's memory*

Villanova University lost one of its best and brightest last year when **Rich Gatti, EE '68**, passed away. On January 17, 2003, the Engineering Alumni Society was proud to honor Rich and his contributions through the donation of a tree and plaque, planted on the campus in his name.

Rich earned his Bachelor's degree in Electrical Engineering in 1968 and went on to gain a Master's from Penn State and become a registered professional engineer in the

Commonwealth of Pennsylvania. Rich was the recipient of the John J. Gallen Award in 1978 for outstanding alumnus.

Rich was very active in alumni activities on behalf of the Engineering Alumni Society. In addition to being one of the founding members, he chaired the awards committee for the annual banquet, was the faculty representative and supported student recruitment efforts for the College of Engineering.

He was an adjunct faculty member at Villanova University for 22 years and earned the rank of adjunct professor. He achieved this rank, normally reserved for only terminal degree holders, based on his two degrees, professional engineer's license, extensive background in power systems and his teaching experience, as well as his excellent rapport with students. Rich was extremely well liked by the students, faculty, and staff. His student comments concerning his teaching skills were consistently outstanding.

For over ten years, he was a reviewer for programs for the preparation for the Engineer in Training Exam and he worked with NCEES in the preparation of the Professional Engineer's Exam.

## ALUMNI PARTICIPATE IN ANNUAL GREATER SAN DIEGO SCIENCE AND ENGINEERING FAIR

Villanova University participated for the seventh year in conferring an award at the 50th Annual Greater San Diego Science and Engineering Fair held in Balboa Park on March 24-28, 2004.

Jessica Rucker, a sophomore at Torrey Pines High School, received Villanova's Certificate of Recognition for her outstanding engineering project "Effect of Tungsten Light on Color Rendering of Low-Pressure Sodium Light." The exhibit demonstrated a commendable level of technical competence and scientific excellence. She received the Science Fair's Sweepstakes Award - Senior Division, which includes a trip to Taiwan, as well as six other professional society recognition awards: General Atomics Fusion Program, Mt. Laguna Observatory Assn., Optical Society of San Diego, San Diego Optometric Society, Society of Women Engineers, and U.S. Air Force.

In addition to the certificate, Jessica was presented with a Villanova executive padfolio provided by the Admissions Office, a Villanova sweat-shirt provided by the Alumni Office, and a Villanova Engineering polo shirt from the School of Engineering.

This year's Fair included 730 entries from students in over 100 schools located in both San Diego and Imperial Counties. The many excellent exhibits provided a challenge and an inspiration for our dedicated judges: Catherine Engler, BSN '96, Katie Brennan, BSN '03, **Jim Murray, EE '61**, Joe Martin, PHY '98, and **Dick Schleicher, ME '57**.



*Jessica Rucker with Dick Schleicher*

## NEWS AND THANKS FROM CE GRAD IN AFGHANISTAN

**2nd Lt. Tim Hinko USAF, CE '03**, is serving a tour in Afghanistan in support of Operation Enduring Freedom. He has written to his former professors in the Civil and Environmental Engineering department to express his thanks to the faculty and to explain how his education has prepared him for his current responsibilities.

At the present time he is filling a Captain's slot as part of a joint task force which covers the entire Afghanistan region. The primary mission of the group is to travel throughout the region assessing possible assault landing zones for C-130s, aircraft capable of operating from rough, dirt strips. The C-130 is the workhorse of the USAF, the prime transport for delivering troops and equipment into hostile areas. In recent years, the aircraft have been used to deliver humanitarian relief to many countries.

Lt. Hinko explains in his letter how his work in assessing landing zones includes the five basics of civil engineering: Geotechnical, Transportation, Structural, Water Resources, and Environmental.

He performs soil tests to determine its strength, and how that compares to the loads and number of landings that can be performed before major repairs are needed.

He has participated in route reconnaissance missions, helping with basic surveying including measuring steep inclines and the radius of sharp curves. This work is done to determine if the necessary vehicles and equipment can be moved through the area. Sharp curves and steep slopes can be obstacles to certain kinds of traffic. They can slow vehicle convoys providing ambush opportunities for enemy forces.

He performs Bridge Load Classifications, assessing the bridges, collecting all of their properties, measurements and moments, to arrive at a maximum load capacity. He measures the quantity of water passing through a stream by taking its cross sectional area and its velocity. His environmental courses prepared him for Environmental Baseline Surveys (EBS), which are done before the military occupies any land. An EBS documents the condition of the land before use, so that no claims for damages can be made after the military leaves.

Lt. Hinko says in his letter that when they drive through a town everyone comes out and stands on the side of the road. Reactions range from curiosity to amazement to fright. Children, for the most part, are friendly; they wave and gratefully catch the school supplies that Lt. Hinko tosses to them. For security reasons stopping is not permitted. The daring stares come from the middle-aged men.

He has been moved by the poverty of the area, with people living in mud huts and using the same source of water for all needs. The roads are rugged dirt trails. Lt. Hinko says that whenever they talk with a governor or a village elder, they are asked to make building roads a priority – he can see why.



*2nd Lt. Tim Hinko stands on an old Soviet armored vehicle, a relic of the Soviet occupation, at a governor's house where he stayed while on a recent reconnaissance mission in Afghanistan.*



*American forces on a typical Afghan road*

## ENGINEERING ALUMNI SOCIETY UPDATES

Our mission is to support the academic excellence, research and other interests of the College of Engineering of Villanova University and to provide for the social and technical advancement of our members. The members of our Society are proud and grateful for the excellent engineering education which we received from Villanova. The EAS provides an opportunity for Villanova Engineers to give something back for the benefit of those following in our footsteps.

We have been hard at work this year. With our new website <http://engineering.villanova.edu/eas/> we have been able to bring online membership registration to our members. This access, combined with the new membership drive, has brought the society's membership to 224 Engineering Alumni.

With the EAS membership dues collected, the EAS has been able to support the current students by donating over \$11,600 in scholarships, grants, and support for student projects. These include three scholarships for incoming freshman as well as support for the following projects: ASCE Student Chapter, Robotics Clubs, Beetlebot, National Society for Women Engineers, Concrete Canoe, Mini Baja, Engineers without Borders and Villanova Engineers Honduras trip.

Go online and keep current with the latest EAS Board Meeting minutes, projects, donations and membership lists. Don't stop there! Become a member today and help make more student dreams a reality.

For further information, write us at: [EAS@villanova.edu](mailto:EAS@villanova.edu)



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## ENGINEERING ALUMNI SOCIETY AWARDS BANQUET AND ALUMNI REUNION WEEKEND

All alumni, family and friends are invited back to campus for Alumni Reunion Weekend, June 11-13, 2004.

Highlighting the weekend is the *Engineering Alumni Society Awards Banquet*, on **Friday, June 11th** at 6 pm in the Villanova Room of the Connelly Center. Now in its 28th year, this annual event honors Engineering alumni who have achieved a level of distinction in their chosen fields. The following awards, named after former deans, are given at the dinner: J. Stanley Morehouse Memorial Award, John J. Gallen Memorial Award, Carl T. Humphrey Memorial Award and Robert D. Lynch Award. In addition, Alumni Awards for Professional

Achievement and Meritorious Service are presented.

In addition to the Engineering Banquet, a full weekend of events is planned during Alumni Reunion Weekend, including the College of Engineering Open House, at which Dr. Barry C. Johnson '70, dean of the college, will give a presentation. This will be held on Saturday, June 12th from 11 am to 12 noon in the Center for Engineering Education and Research, room 001. Please visit [alumni.villanova.edu](http://alumni.villanova.edu) for a full Reunion schedule and information on registering, housing, class web pages and the like.

The cost for the Engineering Banquet is \$40 per person. There is no charge for each Top Cat alumnus (Class of '53 and earlier) to attend the dinner, compliments of the Engineering Alumni Society. There is no charge for the Saturday Open House. Pre-registration is required for the Engineering Banquet and is suggested for the Open House.

To register for all weekend events, call the Villanova University Alumni Association at 1-800-VILLANOVA (800-845-5266) by May 26. Visa, MasterCard, Discover & American Express are accepted.

**Join online today!**

**Visit the website at: <http://engineering.villanova.edu/eas/>**