



# THE FINAL DRAFT

## VILLANOVA UNIVERSITY

### COLLEGE OF ENGINEERING

SPRING 2003 ~ NEWSLETTER

VOLUME 24 ISSUE 1

[www.engineering.villanova.edu/newsletter](http://www.engineering.villanova.edu/newsletter)

EXCELLENCE

INNOVATION

INTEGRITY

## MESSAGE FROM THE DEAN

DR. BARRY JOHNSON

It has been 8 months since I became Dean of the College of Engineering, and the time has passed all too quickly. I keep thinking that the pace will eventually slow down, but for engineers today, the ever-increasing pressures of time and change have become a way of life - so much for wishful thinking.



In my first message in the Fall Newsletter, I mentioned that the College has a proud heritage and a strong record of distinctive accomplishments in engineering education

and research. To build on this base and accelerate progress in the future, a strategic plan has been

developed over the past few months. The plan includes a new vision for the College and key goals that will provide the standards by which we measure our progress. Our vision is "to be recognized nationally as a benchmark for excellence, innovation and distinctiveness in undergraduate and master's level education, and in a few selective doctoral programs; and to achieve these implementations in the spirit of the Catholic-Augustinian tradition." The key five-year goals are to: (1) Continue to offer rigorous and innovative undergraduate programs that are differentiated from other major colleges by the quality of our graduates, (2) Increase the number of master's level programs and students by 50%, (3) Establish one distinctive, interdisciplinary Ph.D. program, and (4) Demonstrate internationally recognized leadership in selected Center-based research areas that are fully integrated into the educational programs.

We will continuously improve not just our undergraduate curriculum and facilities, but also

student services such as advising, mentoring, tutoring, and career counseling and services. Our mission is to provide our undergraduates with the best learning experience possible and to prepare them for successful careers in life after Villanova. Expanding our graduate studies and research efforts is in response to the emerging trends in the engineering profession and 21st century academe. For example, 40% of current practicing engineers have graduate degrees, and the number is expected to double in the next 20 years. Research is the hallmark of graduate education because of the need to expose students to new, leading edge knowledge in their field.

As we move forward on this exciting journey, I will use future messages in the Final Draft to keep you apprised of our performance to these goals. I will also solicit your input and comments, because the role of our alumni and friends as stakeholders is essential to our success.

## VU GRADS SWEEP ENGINEERS OF THE YEAR

### ENGINEER OF THE YEAR

The Delaware Valley Engineers Week Council has named **Robert M. Rodgers, PE, CE '69, MCE '71**, as the 2003 Engineer of the Year.

Rodgers, who co-founded the Center City firm Orth-Rodgers & Associates Inc., in 1977, was selected by representatives from the region's 92 engineering and technical societies. He was honored during Delaware Valley Engineers Week, February 14 to 22, 2003.

Rodgers has more than three decades' experience in transportation planning, including highway needs studies, traffic impact studies, railroad grade crossing accidents, employer trip reduction programs and site access and parking studies for proposed land developments. Rodgers manages a staff of more than 130 people, with an eye towards mentoring and professional development of each employee to fulfill their personal needs.

"As I look at some of the past Engineers of the Year, I am truly honored to be included among

this esteemed group," he said. He added that while he knew he wanted to be an engineer from an early age, the transportation side of engineering hooked him after taking several classes with **Dr. James Schuster, PE**, who recently retired from Villanova University.

### YOUNG ENGINEER OF THE YEAR

The Engineers Club of Philadelphia has selected **Christopher Menna, PE, MCE '00**, Senior Projects Engineer with the Philadelphia Streets Department as the Young Engineer of the Year for 2003. Menna's duties with the city include overseeing four project teams working on various bridge replacement and inspection projects.

Menna was chosen for the award based on his outstanding professional achievements, community and charitable activities and "service beyond self." The award was announced as part of Delaware Valley Engineers Week, February 14 to 22.

Menna has been involved in Engineering Career Outreach in the Philadelphia Public Schools. He is also involved with Habitat for Humanity, Friends of the Wissahickon, Filitalia National (an Italian neighborhood group) and Sons of Italy.



Christopher Menna & Bob Rodgers

## BOEING DONATES SOFTWARE PACKAGE TO THE COLLEGE OF ENGINEERING'S CENTER FOR ADVANCED COMMUNICATIONS

The College of Engineering has received a gift of intellectual property from the Boeing Company in the form of a software package designed to predict the indirect effects of lightning strikes on composite aircraft structures. Lightning strikes, a natural phenomenon that hit commercial aircraft at least once a year, can cause catastrophic damage if the aircraft is not properly protected.

Boeing's software, known as Blitzen, can accurately model the effects of lightning strikes on the electrical wiring and electronic components of composite aircraft structures. The application, valued at more than \$1 million, has been validated through instrumented lightning testing and will be further developed by the College's Antenna Research Laboratory (ARL) (see page 4). **Dr. Ahmad Hoorfar**, Director of the ARL, and **Dr. Moeness Amin**, Director of the Center for Advanced Communications, wrote the development plan, which, upon approval by the Boeing management, has led to this software donation.

In addition to the software, Villanova will receive the accompanying test data, a draft version of a user's manual and 80 hours of technical assistance. Engineering students will write a detailed manual, extend the software's intended frequencies, publish papers describing theories and operations and develop plans for future commercialization of the project.

"The College of Engineering is extremely pleased the Boeing Company has donated this gift to the College's Center for Advanced Communications," said **Dr. Barry C. Johnson, ME '70**, Dean of Engineering. "Blitzen will enable Engineering students to perform cutting-edge research that has real-world application to technologies being developed today and in the future."

Boeing's Intellectual Property Business has established a program to donate patents, software and other properties to nonprofit organizations that have complementary research and development programs. As with Blitzen, donated commodities

typically are promising, early-stage technologies that are not slated for further investment because they do not fit into Boeing's core business strategy.

Gene Partlow, Boeing's vice president of Intellectual Property Business, said, "Blitzen has demonstrated operational performance for commercial viability and has been used successfully on military and civilian projects throughout the world. Villanova has proven expertise in research and development and will help expand and realize the software's full capabilities. We're proud to support the education of future technological leaders." Blitzen was developed by Boeing Philadelphia's Dr. Jack Nachamkin.

Roger Krone, senior vice president, Boeing Army Systems, noted that "Boeing has worked closely with business and universities in the region for many years. We're committed to maintaining these mutually beneficial relationships, as demonstrated by this intellectual property donation."

## NEW WEBSITE BEING LAUNCHED

The College of Engineering website will soon be sporting a new look. Efforts are currently underway to give the current website a facelift, as well as improve the navigation throughout the site. When you visit our new homepage, you will notice two different entries into the site. At the bottom is the classic entry for each department, where a user can click and go directly to the welcome page for each department, and on the left, we've added new audience links so that the user can identify themselves as a member of a particular audience and receive a view of the site that is catered to them. Prospective students, alumni, and corporate visitors will all have a webpage that keeps them abreast of all the news, events, and information of interest to them. Also featured on the bottom of the College's homepage are two news scrollers that feature quick links to upcoming events within the College as well as articles on topics pertinent to the College and the field of engineering.

Once inside, the site contains a simple and consistent interface, which features two collapsible navigation bars. The left bar is based on the audience links and expands to provide the most appropriate options for each audi-

ence. Alumni will be presented with a menu to view upcoming events, locate classmates, and read up on what other College of Engineering alumni have been doing in the world. The right menu bar contains departmental links for easy access to items such as departmental news and events, faculty directories, and current departmental research interests. Also inside will be a number of forms and interactive components designed to increase the efficiency with which the College serves its constituents.

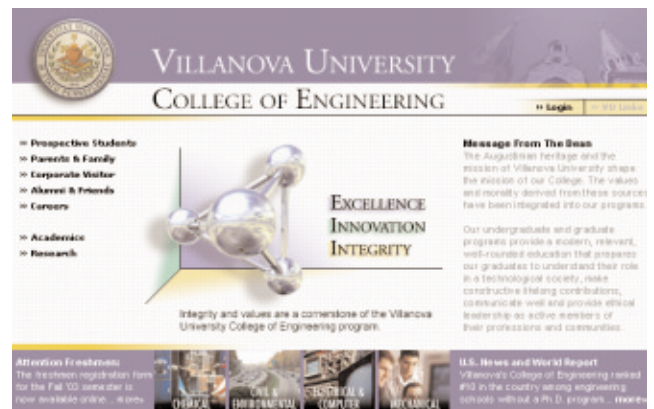
The College's new website will be constantly updated with the latest news, events, and information, so be sure to visit [www.engineering.villanova.edu](http://www.engineering.villanova.edu) often.

### NEWSLETTER STAFF

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### CONTRIBUTORS:

College Departments  
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James O'Brien, CE '71, MCE '79  
Dr. Brian Sullivan, CE '74  
Helen Tursi  
Blueprints  
Villanova Magazine



## CEER IS BLESSED WITH HOLY GROUNDS

Students returning to campus for the spring semester were happy to find preparations underway for a new food service option in CEER. The atrium or “cube” area in the first floor lobby of CEER began the operation of a Holy Grounds in early February. The varied menu offers coffee, juices, breakfast foods, salads, sandwiches, and snacks. A few small tables along the windowed wall provide a welcoming area for students to gather, study and converse.

Timothy Dietzler, Director of Dining Services, said, “For sometime now, we have been well aware of both the need and business opportunity for opening a dining outlet in the Tolentine/CEER vicinity. Finding the right

location and space for a dining outlet has always been the challenge. We are very grateful to Dean Johnson for providing us with a prime location in the CEER building to conveniently provide food and beverages on the west side of main campus.” Customer response to the opening of the Holy Grounds has been enthusiastic. Students, faculty and staff are enjoying the ability to pick up a cup of coffee or quick bite between classes, especially during this year’s cold winter.

Hours of operation are limited from morning until mid-afternoon at the present time. The College of Engineering and Dining Services are investigating a more permanent location and the possible expansion of the Holy Grounds in CEER.



## CENTER FOR ADVANCED COMMUNICATIONS

The Center for Advanced Communications (CAC) held its annual meeting on Oct. 30, 2002, in the Connelly Center Cinema. The event began at 8:45 a.m. with opening remarks delivered by **Dr. John R. Johannes, VPAA**. **Dean Barry Johnson** welcomed the guests and discussed his plans for the College. **Dr. Moeness Amin**, director of CAC and professor of electrical and computer engineering, presented an overview of the Center and discussed its mission and goals. Finally, Dr. James Woods, of Ben Franklin Technology Partners of Southeastern Pennsylvania (BFTP), gave the keynote address, describing how BFTP works in partnership with the Center. Since the summer 2002 BFTP has sponsored four research projects: “One-day Short Course on Space-Time Coding” with InterDigital Communications Corporation, “Geo-Spatial Grid Study” with Smarter Agent, Inc., “Experimental Investigation of Ribbon Turbine Performance” with FLUIDmotive, Inc., and “Integrated Antenna Characterization and Optimization for Breadcrumb Module” with Rajant Corporation.

The events included twelve research project overviews given throughout the day by Villanova faculty members and post-doctoral fellows from the ME and ECE departments. The talks focused on the Center’s current research projects in the areas of communications, signal processing, multimedia, antennas, microwaves and controls. Guests were then given an opportunity to visit the Antenna Research Laboratory and tour CEER. Attendees included representatives from 46 different off-campus organizations from academia, federal and state government, and industry.

The CAC co-sponsored an important event this spring. The Franklin Institute Workshop honoring the 2003 Benjamin Franklin Medal Laureate in Engineering, Dr. Bishnu S. Atal, was held in the Connelly Center Cinema on April 22nd.



*Drs. Johannes, Johnson & Amin greet Mr. Roy Privett of Hitech Associates*



*Dr. Simon Thomas, Dir., Semiconductor Research Corp., Mr. Sal Mastroianni, VP, Motorola, Inc. & Dean Barry Johnson*

## FRANKLIN INSTITUTE & ME CONDUCTS AEROSPACE SYMPOSIUM

On April 24, 2003, Franklin Institute Laureate and Award-Winning Aviation Engineer Dr. Paul MacCready of “Gossamer Condor” and “Helios” fame was at Villanova to conduct a symposium describing his innovative work in the field of aviation over the past fifty years. This symposium, conducted in association with the Franklin Institute 2003 Bower Award in Aviation being awarded to Dr. MacCready, was open to the public and was attended by students of Villanova University and other local colleges and universities, as well as by local aviation engineers and members of the Philadelphia Sections of the American Society for Mechanical Engineers and the American Institute of Aeronautics and Astronautics. Dr. MacCready lectured on his philosophy of aviation design, showed slides and film clips of aircraft he has designed and built over the years, and answered questions about his work from all those in attendance.

## ANTENNA RESEARCH LAB (ARL)

The measurement facility of the Antenna Research Laboratory (ARL) of Villanova University was completed in September 2000 after more than five years of planning, vendor selection, construction, and system tuning and debugging. The ARL indoor facility in the CEER building includes a 29' x 27' x 28' anechoic chamber (compact range) capable of fully automated high quality pattern and gain measurements from 2-40 GHz. It is equipped with ORBIT/FR and HP/Agilent antenna measurement and network analyzer systems. Plans are underway to extend the antenna measurement capability of this laboratory to 110GHz over the next 3 years.

The state-of-the-art measurement capability of the ARL, that exists only at a few other US universities, coupled with a record of more than ten years of externally funded theoretical research in the areas of antennas, microwaves and electromagnetics by the ECE department's faculty at Villanova, has created an educational and research environment that is unique in the Delaware Valley and conducive in bringing government and industry together for collaboration on joint projects. In fact, right after the completion of the ARL's antenna anechoic chamber facility in the summer of 2000, the Naval Sea Systems Command,



Research Assistant, **John McVay, EE '01, MEE '03**, in the ARL

NSWC CD - Philadelphia, contacted Villanova with possible collaboration with regard to its antenna research and development needs for the US Navy. At the first meeting, **Dr. Ahmad Hoorfar** (the ARL's director) and the NSWC CD representatives realized that such collaboration could be of great benefit to both sides. The combination of ARL's proven record of analysis and design capabilities, now greatly enhanced with its new anechoic chamber, and the NSWC CD's engineering staff with more than 20 years of experience in antenna measurements was indeed a recipe for success. This academia/government relationship allows Villanova's ARL to offer extensive facilities and expertise to government and industry for the research, development, integration, evaluation and testing of antenna components and systems. The current research projects at ARL are funded by various federal agencies and industrial companies such as DARPA, Office of Naval Research (ONR), National Science Foundation (NSF), Boeing and Lockheed Martin.

## CHEMICAL ENGINEERING

## FACULTY

**Dr. William J. Kelly** published papers in the *J. of Chromatography* entitled "Rapid Analysis of a Plasmid by Hydrophobic-Interaction-Chromatography with a non-porous Resin," and in *Biotechnology Progress* entitled "Using a CFD Model to Understand the Fluid Dynamics Promoting E. Coli Breakage in High-Pressure Homogenizers". He also made two presentations at an ACS Meeting in August 2002, in Boston, MA. The presentations were titled "Using Computational Fluid Dynamics (CFD) to Predict Particle Retention and Shear in Industrial Continuous-flow Centrifuges", and "Optimizing Alkaline Lysis for DNA Plasmid Recovery".

**Dr. Kenneth R. Muske** was awarded the 2002 *CAST Director's Award* from the Computing and Systems Technology (CAST) division of AIChE for the paper "Open-loop Optimization of Batch Operating Policies" presented at the AIChE Annual Meeting held in Indianapolis, IN. Dr. Muske also published two papers: one, "Disturbance Modeling for Offset-Free Linear Model Predictive Control" in the *Journal of Process Control*, and the other, "Optimal Measurement System Design for Chemical Processes", in *AIChE Journal*. Dr. Muske presented four papers at the 2002 American Control Conference held in Anchorage, Alaska. He is presently serving as the Publications Chair for the 2003 American Control Conference to be held in Denver, Colorado, in June 2003.

**Dr. Randy W. Weinstein** has had two papers published: "Transient Thermal Management of a Handset Using Phase Change Material (PCM)," in the *Journal of Electronic Packaging* and "Controlling the Properties of n-Alkanethiolate Self-Assembled Monolayers on Gold Using Supercritical Carbon Dioxide-Ethanol Mixtures as Solvents," *Industrial and Engineering Chemistry Eng. Research*.

**Dr. Edward Ritter** presented a paper, "Computational Study of the Decomposition of 1,1,1,3,3,3-Hexafluoropropane", coauthored with **John P. Dawson, ChE, '03** at the 3rd Joint Meeting of the US Section of the Combustion Institute at the University of Illinois at Chicago.

## CIVIL AND ENVIRONMENTAL ENGINEERING

## FACULTY

**Dr. Metin Duran** was nominated and elected to the Education Committee of the Association of Environmental Engineering and Science Professors (AEESP) in January 2003. The AEESP is made up of professors in academic programs throughout the world who provide education in the sciences and technologies of environmental protection. The main goal of this unique organization is to strengthen and advance the environmental field through cooperation among academic and other communities.

## NOTEWORTHY

- ❖ A conventional concrete and asphalt pedestrian area in the center of Villanova University's campus was recently voluntarily retrofitted with an infiltration BMP as part of the "growing Greener" program funded by the PADEP. The conventional materials were removed and replaced with porous concrete underlain by stormwater recharge beds. To date, infiltrated water from infiltration BMPs has not been the subject of much study. **Dr. Robert Traver** and **Dr. Andrea Welker**, working through the Villanova Urban Stormwater Partnership, have developed a program to monitor the effectiveness of this BMP.

# DEPARTMENT NEWS

## ELECTRICAL AND COMPUTER ENGINEERING

### FACULTY

As a Distinguished Lecturer of the IEEE Signal Processing Society for the year 2003, **Dr. Moeness Amin** has given eight technical presentations in Middletown (New Jersey), Dallas (Texas), Marrakech (Morocco), Cairo (Egypt), Ankara and Istanbul (Turkey). In the spring 2003, he published two journal articles and co-authored 10 conference papers, presented in Morocco, Hong Kong, Japan, and the US. Dr. Amin has also participated in the NATO Synthetic Aperture Radar meeting in Madrid, Spain, in February 03. Dr. Amin's research group includes four postdoctoral fellows and five graduate students.

**Dr. Robert Caverly** spoke at the 2002 Gallium Arsenide IC Symposium in Monterey, California. His talk, "Gallium Nitride: Use in High Power Control Applications," focused on a specific application of this emerging technology. Dr. Caverly also presented a talk on "RF Semiconductor Control" at the 2002 International Microwave Symposium. He is currently University Liaison and member of the Technical Program Committee for the upcoming IEEE International Microwave Symposium to be held at the Philadelphia Convention Center. Dr. Caverly was a reviewer for the National Science Foundation Early Faculty CAREER Program during the fall of 2002 and had a journal paper published titled "Modeling the Zero and Forward Bias Operation of PIN Diodes for High Frequency Applications, in Solid-State Electronics," with former post doctoral researchers N. Drozdovski and L. Drozdovskaia, and **Michael Quinn, MEE '01**.

**Dr. Ahmad Hoorfar** was an invited speaker at the plenary session of the 2002 International Conference on Mathematical Methods in Electromagnetic Theory (MMET '02) held in September in Kiev, Ukraine. His presentation was entitled "Evolutionary Computational Techniques in Electromagnetics". He also attended the 2002 JINA International Symposium on Antennas held in November in Nice, France. At this symposium, he presented a paper co-authored by Drs. V. Jamnejad and F. Manshadi of NASA's Jet Propulsion Laboratory (JPL) in Pasadena, CA, entitled "Evolutionary Design of Corrugated Horn Antennas".

**Dr. Bijian Mobasseri** received grant renewal for the third year from the US Air Force Office of Scientific Research for his project titled: Smart Digital Video: Watermarking for Cooperative Content. Dr. Mobasseri published the articles: "Watermarking of Compressed

Multimedia Using Error-Resilient VLCs", at the IEEE Workshop in Multimedia Signal Processing in St. Thomas, US Virgin Islands, in December, which was co-authored with **Dom Cinalli, MCPE '03**; "Watermarking for Self-authentication of Compressed Video," co-authored with **Dan Cross, MEE '02**; and "Digital Watermarking in Joint Time-Frequency Domain," which were presented at the IEEE International Conference on Image Processing in Rochester, New York, in September.

**Dr. James Peyton-Jones** gave a presentation on Catalyst and EGO Sensor Modeling to an SAE TOPTEC in Detroit, and a similar presentation at Southwest Research Institute.

**Dr. Pritpal Singh** recently published two papers in the Journal of Power Sources, one with **Dr. Sudarshan Nelatury** titled "Extracting Equivalent Circuit Parameters of Lead Acid Cells from Sparse Impedance Measurements", and a second titled "Impedance Modeling of Intermediate Size Lead Acid Batteries", with five co-authors. A US patent was issued to Dr. Singh titled "A Method for Determining Battery State-of-Health Using Intelligent Systems," (Co-inventors: C. Fennie and D.E. Reiser) U.S. Patent No. 6,456,988 (September 24, 2002) and he was invited to present a paper at the MIT 42V Consortium Meeting in Dearborn, MI, on March 5, 2003. The paper is titled "Fuzzy Logic-Based SOC/SOH Monitoring of Lead Acid Batteries".

### NOTEWORTHY

❖ The state-of-the-art Advanced Automotive Emissions Control & Diagnostics Test Bed recently funded by NSF is underway with the delivery of the first fast FID analyzer and has also received further industrial support in kind from Exxon Mobil to donate a combustion air handling system and ATI, an engine management calibration system, at significantly reduced price.

❖ In the fall 2002 the ECE department awarded six graduate certificates, two in the Electric Power Systems Concentration, and four in the Wireless and Digital Communications Concentration.

## MECHANICAL ENGINEERING

### FACULTY

**Dr. Hashem Ashrafiuon** presented and published two papers in September at the 2002 ASME DETC Mechanism conference in Montreal, Canada. The first paper was co-authored with **Drs. Farbod Fahimi** and **C. Nataraj** and titled "Inverse Kinematic Solution for Universal-Jointed Hyper-Redundant Robots." They also published a paper in the January 2003 issue of the Journal of Robotic Systems entitled, "Obstacle Avoidance for Spatial Hyper-Redundant Manipulators Using Harmonic Potential Functions and the Mode Shape Technique". The second paper of the ASME conference was co-authored with **Mohammad Elahinia, EMME '01**, and titled "Nonlinear Control of a Shape Memory Alloy Actuated Manipulator." Dr. Ashrafiuon has developed a senior level undergraduate course called "Introduction to Robotics" during his sabbatical in fall 2002. This course is currently being offered.

**Dr. Amy Fleischer, ME '91, MME '96**, presented a talk entitled "Thermal Management of Electronics" at Villanova's Center for Advanced Communications Annual Meeting in October. She also published an article entitled "High Rayleigh Number Convection of Pressurized Gases in a Horizontal Enclosure," in the October issue of the Journal of Fluid Mechanics.

At the 2002 ASME IMECE in New Orleans in November, **Dr. G. F. Jones** presented a paper with one of his graduate students, **N. R. Murarisetty, GCPS '02** entitled "Transient Heat Transfer for an Actively Insulated Shape Memory Alloy Wire", **Dr. Amy Fleischer** attended the meetings and sponsored sessions of the ASME K-16 committee on Electronics Cooling, of which she is a member, and **Dr. Sridhar Santhanam** attended the national ASME Student Section committee meeting as the Region III faculty advisor representative. He also attended a workshop on ABET accreditation held during the same meeting.

**Dr. Kenneth Kroos** and **Prof. James O'Brien** are currently working on a research project entitled "Experimental Investigation of Ribbon Turbine Performance," which has been funded by the Ben Franklin Technology Partners.

**Dr. C. Nataraj** was elected to the Technical Committee on Vibration and Sound of the American Society of Mechanical Engineers. This international committee oversees biennial ASME conferences and the Journal of Vibration and Acoustics.

**Dr. Sridhar Santhanam** has been appointed College Relations Chair for Region III of ASME International.

## MECHANICAL ENGINEERING CONT.

### NOTEWORTHY

❖ A new graduate course on the Thermal Management of Electronics is being offered jointly by Villanova University, the Georgia Institute of Technology, Auburn University and the University of Maryland. **Dr. Amy Fleischer** is the lead professor for VU, students on all campuses work on the same case studies, and the professors lecture jointly in all locations through distance learning video conferencing.

❖ As part of the requirements for the Master of Mechanical Engineering degree, the following students successfully defended their theses for 2002 September and December graduation:

**Mr. Saeed Daroogheha**, “Design and Development of a Miniature Robotic Gripper”, advisor, **Dr. T. Radhakrishnan**.

**Mr. Masoud Fegghi**, “Obstacle Avoidance and Optimal Path Planning of Car-Like Robots”, advisor, **Dr. C. Nataraj**.

**Mr. Sudip Bose**, “A Constitutive Model for Shape Memory Alloys and Its Application in Design”, advisor, **Dr. Sridhar Santhanam**.

**Mr. Bryan Wenzel**, “Dynamic Effects in Mobile Wheeled Devices”, advisor, **Dr. C. Nataraj**.

### GRANTS/AWARDS

**Dr. William Kelly**, ChE, received an equipment grant from Glaxo Smith-Kline Pharmaceuticals for \$250,000. This equipment is donated for Villanova University’s new Biotechnology Laboratory. He received a grant for *Animal Cell Harvest Operation* from SmithKline for \$15,000. This award is to build a device for measuring the degree of “detrimental shear (laminar) effects” on cell breakage for typical animal cells. He also received a grant for *Centrifugal Scroll Decanters* from Merck & Co. for \$16,500. This project is for the development and testing of mathematical models for the operation of centrifugal scroll decanters.

**Drs. Randy Weinstein** and **Ken Muske**, ChE, received an equipment grant from Glaxo Smith-Kline Pharmaceuticals for \$81,000. This equipment will be utilized by the Chemical Engineering Department in various research projects.

**Dr. Randy Weinstein**, ChE, received an equipment grant from the *Laboratory Education Program* at Los Alamos National Laboratory for \$26,675.

**Frank Falcone**, IEER, CE, received grants from the Ben Franklin Technology Partners for \$15,000. for the continuation of the Institute for Environmental Engineering Research support and from the Foster-Wheeler Environmental Corp. for \$7,104. This project is a continuation of the ongoing investigation to provide technical advice and environmental consultations in the area of health risk assessment to the Defense Supply Center in Philadelphia.

**Dr. David Dinehart**, CE, received a \$225,000. grant from the NSF titled, *Using Viscoelastic Material to Reduce the Dynamic Response of Woodframe Structures*. This research will develop an advanced panel system for improving the seismic performance of woodframe structures.

**Drs. Rominder Suri** and **Randy Maud**, CE, received a \$25,734. grant from PADEP titled *Watershed Assessment in Southern Chester County, PA for Pharmaceutically Active Compounds (PAC)*. This project will provide data on the type, level and extent of PACs in certain watersheds of Chester County.

**Drs. Joseph Yost, David Dinehart and Shawn Gross**, CE, received a grant for *Structural Performance of Prefabricated Steel Joists and Castellated/Cellular Beams* from SMI Joist for \$118,081. This award is the first in a 5 year partnership with SMI Steel Products/SMI Joist, which consists of experimental investigation, analytical study, and internship opportunities for Villanova graduate and undergraduate students at SMI facilities.

**Dr. Moeness Amin**, CAC, ECE, received a grant for *Signal Processing Techniques for Anti-Jamming GPS Receivers* from the AFRL/IFB for \$60,000. This project explores new anti-jamming techniques for GPS receivers. He also received a grant for *Classification and Discrimination of Sources with Time-Varying Frequency and Spatial Spectra*, from the ONR for \$100,000. This research focuses on multi-sensor array receivers of source signals with both time-varying spectral and spatial characteristics. Dr. Amin received a grant for advances in *Space-Time Coding* from InterDigital Communications Corp./ Ben Franklin Technology Partners of SE Pennsylvania (BFTP) for \$7,500. This grant provides the assessment of the fundamental and existing knowledge of space-time coding and its applications in wireless communications. He received a grant for *Geo-Spatial Grid Study* from Smarter Agent, Inc/ Ben Franklin Technology Partners of SE Pennsylvania (BFTP), for \$18,750. This study is to determine the current accuracy of geo-spatial data for Philadelphia and the surrounding areas.

In addition, the Center for Advanced Communications received funding in the amount of \$140,000. from the Boeing Company for a research project investigated by **Dr. Ahmad Hoorfar** and from FLUIDmotive, Inc./BFTP, in the amount of \$10,000., for a research project investigated by **Dr. Kenneth Kroos**.

**Drs. Moeness Amin** (Project Director) and **Ahmad Hoorfar**, CAC, ECE received a grant from Concurrent Technologies Corporation (CTC)/DARPA, for \$900,000. The task is to develop a “Through Wall Microwave Imaging” (TWMI) sensor that can detect and surveil persons behind solid obstacles. Drs. Hoorfar (PI) and Amin (Co-PI) also received a grant for *Integrated Antenna Characterization & Optimization for Breadcrumb Module* from Rajant Corporation/Ben Franklin Technology Partners of SE Pennsylvania (BFTP) for \$21,000. The task is to optimize the BREAD-CRUMB integrated antenna locations.

**Dr. Ahmad Hoorfar**, ECE, received a grant for *Advanced Printed Antennas for Hybrid Fiber-Optic/Wireless System* from the ONR for \$44,000. This grant is additional funding in the development of small, lightweight microstrips, and other printed antenna technologies suitable for the hybrid fiberoptic/millimeter wave system.

**Dr. Bijan Mobasseri**, ECE, received a grant for *Smart Digital Videos: Watermarking for Cooperative Content* from the Air Force Office of Scientific Research for \$50,778. This research builds upon work done at Rome Lab to develop novel digital video authentication algorithms. He will extend this work by proposing a broader class of signals called smart video. Smart videos are capable of performing a variety of tasks that enhance the security of gathered intelligence.

**Dr. Pritpal Singh**, ECE, received a grant for *Portable Defibrillator Fuzzy Logic-Based Meter* from NIH/Nanocorp for \$113,678. This award is a PHASE II STTR project to further develop a portable defibrillator. He also received a grant for *Simulation of an EV Racing Car* from BFTC/eMotorsport for \$4,700. This grant is for the successful completion and installation of an electric stockcar’s drivetrain.

**Dr. Kenneth Kroos**, ME, received a grant for *Experimental Investigation of Ribbon Turbine Performance*, from FLUIDmotive, Inc./Ben Franklin Technology Partners of SE Pennsylvania for \$10,000. This research is an experimental study of the effectiveness, the efficiency and the practicality of using a ribbon drive as a power producing turbine. This project will be run through the Center for Advanced Communications.

- In memory of the late Chair of the Chemical Engineering Department, the R. E. White Scholarship Awards of \$1,500. each were presented to: **Erika Squitieri '05**, **Nicholas Falco '04** and **Jeffrey Fearnside '03**. The awards are based upon a combination of academic record, financial need and their prospects for career contributions as a chemical engineer.
- The ASME Student Chapter at Villanova is planning an AntWeights competition with other student sections in the area. The other colleges would build their devices ahead of time or build them at Villanova and then compete in an arena.
- **Christine Boyda, ME '03**, has been awarded a grant from the W. W. Smith Foundation. The Foundation awards two \$5,000. scholarships to students in their senior year. Christine is president of Tau Beta Pi. She has also been inducted into the National Society of Collegiate Scholars and the Phi Kappa Phi national honor society. In addition, Christine is a part of the Executive Board of the campus UNICEF group, and this past winter she went to South Africa with a group of 11 other Villanovans on a Habitat for Humanity trip. In the fall, Christine is planning on beginning graduate studies at Arizona State University.

## WHO'S WHO

The College of Engineering is pleased to announce that the following students were named to *Who's Who Among Students in American Universities and Colleges*, 2002-2003:

Ami Badami, ChE  
 Emily Cushnie, ChE  
 John Dawson, ChE  
 Aimee Deck, CE  
 Bradley Degnan, CE  
 Jeffrey Fearnside, ChE  
 Charles Gallagher, ME  
 Elizabeth Gaynor, CE  
 Peter Klimas, CPE  
 Sally Miller, ChE  
 Jenny Papatolis, ChE  
 Patrick Sheldrake, ME

## AICHE REGIONAL STUDENT CONCLAVE

The Mid-Atlantic Student Regional AIChE Conference was held at Villanova University March 28-30, 2003. Chemical Engineering students from over 30 universities participated at the conference. A competition was held among "ChemE Cars" – which were required to utilize a chemical reaction to carry a specified amount of weight a given distance. Professional chemical engineers gave talks on their

careers in both traditional and non-traditional fields. A career development program gave students a chance to prepare resumes, improve interview skills, and discuss what employers are looking for. The conference was designed for undergraduate students, but many alumni and professionals in the area also attended.

## ME ROBOTICS COMPETITION

The Mechanical Engineering Sophomore Robotics Competition was held on Friday, November 22, 2002, in CEER 001. Twenty robots competed with about 200 people in attendance at this competition.

The competitors designed and built robots that were to collect pegs which represented students at various locations around campus. These pegs (students) were to be deposited at a specific location, which represented their classroom, on the competition platform. Points were assigned for each peg that was completely inside the "classroom" after the allotted time. Pegs standing vertically (students awake) were worth

more points than pegs lying horizontally (students asleep). Bonus points were assigned to any robots that did not "throw" any pegs off campus or drive over any buildings while performing their tasks. The winning robot "Don't Blink" was designed by **Matthew Voorhees, Peter Magner, Mark Grgas, and Simon Cantos**. Taking second place was "Jitters", designed by **Jonathon Yoder, Grant Talcik, Julie Little, Lisa Franciotti, and Andrew Franzonia**. In third place was "Shaniqua" designed by **James Wilcox, Timm Strayer, Elizabeth Lavine, Richard Donovan, and Selena Brown**.



Student competitors **Robert Picone, Keri Kamon, Alexander Cullen, and Andrea Salierno**

## VILLANOVA ENGINEERING ALUMNI SOCIETY

The Villanova Engineering Alumni Society (EAS) supports engineering programs at Villanova University. The Society links the College of Engineering's students and faculty to a diverse community of College alumni. It has sponsored various engineering groups and projects, such as the Solar Cat Club, the Concrete Canoe (ASCE), the Battle Bots (Robotics Club), the Mini Baja Car Club, and the Concrete Egg Protection Device (ACI). It has helped to fund the Engineering Semi-Formal, the Annual Engineering Banquet, and this year's Chemical Engineering National Conference. Last year, it made available \$1,000 academic scholarships to each of four outstanding prospective engineering students. Moreover, in the spirit of the University's mission to serve those in need, last spring the Society provided financial support for engineering students to participate in humanitarian relief work in Honduras.

To continue these endeavors and support the very high quality of engineering education at Villanova, the Society needs the help of Engineering Alumni like you. Please take this opportunity to join the Society for the annual membership fee of only \$25. To the many current members, thank you for your support to the Society. We most sincerely welcome your continued involvement in its work.

- 51 Chuck Devenny, EE**, celebrated 50 years of marriage at a special family dinner on May 18. They were also joined by his EE classmates, **Joe Kleschick, John Currie** and **Lee Clayton**, and their wives, marking the group's half century of shared friendship.
- 58 Louis J. Pinto, ME**, director of engineering for Nilfisk-Advance America in Malvern, PA, won a 2002 ASTM Award of merit.
- 59 Norman W. Huddy Jr., EE**, program manager at Mitre Corp. in McLean, VA, has announced their birth of his fifth and sixth grandchildren.
- 61 Richard Schneider, Ph.D., EE**, received a doctorate in systems engineering from George Mason University in the spring of 2002. While working full-time as senior engineer at ITAC, a small engineering company in Reston, VA, he continues his research and teaching. He and his wife, Lydia, the parents of six grown children, reside in Clifton.

**65 James F. Kostecky, PE, CE**, in May 2002 was appointed executive vice president, business development, of the Allied Building Corp. in Center Valley, PA. Kostecky is listed in *Who's Who in Technology Today* and has been involved extensively in leadership roles in community organizations, including United Way, Boy Scouts and the American Red Cross.

**66 Thomas Lagana, EE**, co-authored *Chicken Soup for the Volunteer's Soul* and *Chicken Soup for the Prisoner's Soul* (Health Communications, Inc. 2002).

**Joseph Coessens, CE**, was honored at a retirement party after 36 years of service at Bessemer Lake Erie Union Railroad Company in Monroeville, PA. His most recent position was as chief engineer and mechanical superintendent of the Union railroad.

**73 Andrew J. Milligan, Ph.D., ChE**, president and chief executive officer of Bionix Development Corp., received the 2002 Ernst & Young Entrepreneur of the Year Award for Northwest Ohio. Dr. Milligan formed Bionix in 1984 to develop and market unique single-use medical devices and radiation therapy products. He holds academic appointments as adjunct professor of radiation oncology at Jefferson Medical College in Philadelphia and adjunct professor of chemical engineering at Villanova and is a member of the Engineering Alumni Society Leadership Council.

**80 Merrell C. Cashion Jr., ChE**, program and resources administrator for the Board of Patent Appeals and Interferences in Washington, DC, was honored with the Department of Commerce Bronze Medal recognizing excellence in the performance of duties. He serves as a principal administrative assistant to the chief judge and the vice chief judge.

**82 Byrne Mulrooney, ME**, president of the Midwest region, operations solutions, for Electronic Data Systems Corp., was named to the board of trustees of the Illinois Institute of Technology in Chicago. He also serves on the boards of The Executives' Club of Chicago, the Chicago Boys and Girls Clubs, and the Chicago Symphony Orchestra. Mulrooney holds a master's degree in management from Northwestern University's Kellogg Graduate School of Management.

**84 Alan L. Zeigler, PE, MCE** joined Larson Design Group Inc., architects, engineers and surveyors in Williamsport, PA. He serves in the water/wastewater department.

**85 Ben Marino, EE**, is a loan officer at Irwin Mortgage Corp. in Carson, CA. He and his wife, **Kathi Squadrito Marino '85, Nur.**, and their children reside in Laguna Niguel.

**91 Marianne Kiernan, PE, CE**, of Potomac, MD, was named senior associate and head of the Laurel, MD office of KCI Technologies, Inc. She has designed more than 500 telecommunications facilities in the Baltimore/Washington corridor.

**93 Navy Lt. Vincent A. Augelli, ME**, is communications officer on the staff of the commander, Carrier Group Eight, in Norfolk, VA. He recently completed an Arabian Sea deployment on the USS Theodore Roosevelt.

**Patrick J. Huvane, CE**, received an MBA degree from the Kenan-Flagler Business School at the University of North Carolina. He is associate brand manager with Kraft Foods Inc. in Rye Brook, NY.

**95 Michael Curry, EE**, completed requirements for his MBA degree at the University of Maryland.

**Stephen J. Burgo, EE, CEE '98**, is a civil/environmental engineer for the Pennsylvania Department of Environmental Protection in Conshohocken, PA. He and his wife, Margaret, reside in Berwyn.

**Vincent M. Carita, Esq., PE, MCE**, joined Urban Engineers Inc. in Philadelphia as deputy practice leader for litigation support. A registered professional engineer, as well as an attorney, he will augment Urban's ability to provide clients with claims avoidance strategies; claims resolution; and counsel for litigation strategy, interrogatories, depositions and exhibit preparation.

**99 Navy Lt. J. G. John W. Ryan, CE**, is stationed on the USS Harry S. Truman (CUN-75) in Norfolk, VA.

**00 Navy Lt. J. G. Matthew W. Nawn, ME**, graduated from the Basic Civil Engineer Corps Officer School in Port Hueneme, CA. He has returned to Norfolk, VA, for reassignment.

**Joseph P. Valentine, EE**, earned an MEE degree at Princeton University in May 2002 and is now a candidate in a doctoral program there.





### SPRING BREAK IN HONDURAS

A group of 11 civil engineering students traveled to Honduras over the 2003 spring break with **Dr. David Dinehart** and **Shawn Gross** to work on a reinforced concrete building that they have designed in their Capstone course. The building will serve as a chapel and volunteer center for Amigos de Jesus, a Catholic orphanage for boys. This was the fourth mission trip that Villanova civil engineers have made to the site. Following the design and construction of the cross in 2000, the last three trips have focused on the chapel. The photos show the progress that has been made over the past two years. In 2001 the foundations were dug and poured, in 2002 the columns and some walls were erected, and this year an elevated slab and T-beams were constructed. The chapel will be completed this summer, and plans are being made for next year's project, a school to house grades K through 6. The students and faculty of the Civil Engineering Department thank the College of Engineering, Campus Ministry, and the Engineering Alumni Society for their annual support.



VILLANOVA UNIVERSITY  
College of Engineering  
Villanova, PA 19085-1681

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Organization

**ENGINEERING ALUMNI AWARDS BANQUET**  
**Friday, June 6, 2003**

<p>Villanova Room, Connelly Center \$40 per person 6 PM - 7 PM Cocktails  7 PM - 10 PM Dinner and Awards Ceremony</p>	<p><b>**Open Seating**</b>  <b>There is a limited amount of seating for this affair.</b></p>
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***Are you a Top Cat?***

Did you graduate in 1953 or before? If so, the Engineering Alumni Society will pay for your ticket. When you register, simply mark the number attending the dinner and pay for all but your ticket.

For banquet details and registration, visit our Web Site at <http://www.engineering.villanova.edu/banquet/> or call 1-800-Villanova to receive all Reunion Weekend information. Add "straycats/" to the above web address to view classmates and retired faculty contact information. Please be sure to give your name and complete mailing address as well as your graduating year and major.