Feniosky Peña-Mora
New SEAS Dean
Cover Story

University of Illinois’ Peña-Mora Is Dean

Feniosky Peña-Mora, associate provost and Gutgell Endowed Professor in Civil and Environmental Engineering at University of Illinois, has been named Dean.

Making the Internet Safe from Cyber-crooks

Led by Professor Salvatore Stolfo, faculty of the Department of Computer Science concentrate on protecting the public from cyber-criminals and the country from cyber-terrorists.

Quants “Dream Team” of Financial Engineers

Three noted SEAS financial engineers, including a Nobel laureate, discuss the future of their field at a panel discussion for students and alumni sponsored by the School.

Entrepreneurship Finds a Home in SEAS

SEAS is fostering entrepreneurship through its program of mentorship and support services to students competing in the Columbia Venture Competition.

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Columbia University President Lee C. Bollinger has appointed Feniosky Peña-Mora as the next dean of The Fu Foundation School of Engineering and Applied Science (SEAS), effective July 15.

Peña-Mora has earned an international reputation for his scholarship, teaching, research and engineering innovations, as well as hands-on leadership in managing major university engineering programs at the Massachusetts Institute of Technology (MIT) and the University of Illinois, where he has served as associate provost.

“Columbia is fortunate to welcome such a remarkable new engineering dean at a time when the school is becoming ever more central to the university’s mission—from its interdisciplinary work with our medical center in the life sciences and our Earth Institute in climate science to its pioneering service-learning curriculum that is a national model for civic engagement between university and community,” said Bollinger. “He will be an outstanding leader for our School of Engineering and Applied Science.”

Peña-Mora comes to Columbia after six years at the University of Illinois at Urbana-Champaign where he has served as the Edward William and Jane Marr Gutfsell Endowed Professor in the civil and environmental engineering department, a center affiliate at the National Center for Supercomputing Applications, and a faculty affiliate at the Beckman Institute.

“I was so impressed with the energy and enthusiasm I saw among the faculty, students, staff, and alumni/ae at the school,” said Peña-Mora. “It was clear to me that the SEAS leadership at Columbia has built a very strong foundation in recent years, well positioning the school to move to the next level in terms of its impact on the university, the local community, the nation and the world. Many important innovations have taken place at SEAS over its long history and continue to take place today. It is exhilarating for me to see how committed Columbia’s students, faculty, staff, alumni/ae and university leadership are to an even more exciting future.”

His research interests include information technology support for collaboration in preparedness, response and recovery during disasters involving critical physical infrastructures. He is also involved in change management, conflict resolution, and processes integration during the design and development of large-scale civil engineering systems. His research has been groundbreaking in the field of construction engineering and management.

“AM very pleased that Feniosky Peña-Mora will be the next dean of The Fu Foundation School of Engineering and Applied Science,” said Provost Alan Brinkley, who led the search process. “He is a distinguished civil engineer with broad administrative experience at the University of Illinois, and he will bring vision and enthusiasm to this distinguished school. In welcoming Dr. Peña-Mora, I also want to express our gratitude to Gerald Navratil for his dedicated and skillful leadership as acting dean of SEAS over the last two years.”
As a scholar, Peña-Mora is the author of more than 100 publications in refereed journals, conference proceedings, book chapters and textbooks on computer-supported design, computer-supported engineering design and construction, as well as project control and management of large-scale engineering systems. His publication, “Design Rationale for Computer Supported Conflict Mitigation,” received the 1995 award for best paper published in the Journal of Computing in Civil Engineering. He is also the author of the influential 2002 textbook, *Introduction to Construction Dispute Resolution*.

He is the holder of the 1999 National Science Foundation CAREER Award and the White House Presidential Early Career Award for Scientists and Engineers. In 2007, he won the Walter L. Huber Civil Engineering Research Prize of the American Society of Civil Engineers (ASCE). In 2008, he was recognized with the ASCE Computing in Civil Engineering Award for outstanding achievement and contribution in the use of computers in the practice of civil engineering.

“I am excited that Feniosky Peña-Mora will be dean of the engineering school, because I know that the school will benefit greatly under his leadership,” said Peter Valeiras ’09, president of the Engineering Student Council, who served with graduate student Amy Betz on the search committee. “He has many great ideas for the future of the school, specifically on the relationship between faculty and students. That will create a stronger sense of community and family within the school.”

Peña-Mora’s experience reflects the practical, problem-solving mission of engineering and applied science. He is a professional engineer registered in the Dominican Republic and has been a key figure in a variety of international projects. He has founded high-tech startup and consulting companies and has worked with both the construction industry and governments in various countries, including Argentina, Colombia, the Dominican Republic, Puerto Rico and Japan.

“Feniosky Peña-Mora is the leader we have been looking for,” said Andy Gaspar ’69, who served on the search committee. “He will be an energetic and articulate advocate for our school and for the pivotal role of engineering in today’s society. SEAS is in great shape, both academically and financially, and provides an ideal platform for the new dean to implement his vision and grow Columbia’s standing as a world class engineering school in one of the world’s great universities.”

Although a native of the Dominican Republic, coming to upper Manhattan as a Columbia dean represents a homecoming for Peña-Mora, who spent part of each year while growing up living with family in Washington Heights. He first learned to speak English in his early twenties by attending English-as-a-second-language community programs at Teachers College, Riverside Church and other organizations in the city.

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**Academic Fêtes**

The academic lives of two long-time professors at The Fu Foundation School of Engineering and Applied Science were honored at special academic celebrations. **Van C. Mow**, Stanley Dicker Professor of Biomedical Engineering, was honored by biomedical engineering colleagues in celebration of his 70th birthday. Similarly, colleagues of **Richard M. Osgood, Jr.**, Higgins Professor of Electrical Engineering and Applied Physics, celebrated his 40 years of contributions to the fields of electrical engineering and applied physics.

Mow joined the SEAS faculty in 1995 and was the founding director of the Center for Biomedical Engineering, which later became the Department of Biomedical Engineering, of which he is the founding chair. A member of the National Academy of Engineering and the National Institutes of Medicine, he is recognized as a leader in his field. The keynote speaker included Prof. Mow and Shu Chien, University Professor and Y.C. Fung Professor of Bioengineering and Medicine at University of California at San Diego; Savio L.-Y. Woo, University Professor, University of Pittsburgh; and Sheldon Weinbaum, CUNY Distinguished Professor.

Osgood came to SEAS in 1981 and was named Higgins Professor in 1988. He served as an associate director of Brookhaven National Laboratory from 2000 to 2002 and acting director of its Nanocenter in 2002. A co-founder of the Columbia Microelectronics Sciences Laboratories (MSL), he has served as director and co-director of MSL and the Columbia Radiation Laboratory (CRL). Among the guest speakers were Professors Steve Bacskik, University of New Mexico; Vladimir Bulovic, MIT; Bahram Jalali, UCLA; Jim Misewich, Brookhaven National Laboratory; Alan Wilner, University of Southern California, and Peter Moulton, Q-Peak, Inc.

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**Somasundaran Honored**

La von Duddleston Krumb Professor Ponisseril Somasundaran was honored for “his life-long dedication and achievement in mineral process engineering” by the Society for Mining, Metallurgy and Exploration (SMME). Shown here are, from left to right, Prof. Jon Kellar, Chairman of Mineral Processing Division of SMME/AIME, Prof. Somasundaran, and Dr. Brij Moudgil, past President and Board Member of SMME.
Making the Internet World Safe From Cyber-Criminals

As early as 1996, the dangers of a cyber-assault were recognized by Professor Salvatore J. Stolfo of the Department of Computer Science, and he received Defense Advanced Research Projects Agency (DARPA) funding for a project for intrusion detection systems (IDS). His foresight has resulted in Columbia’s computer science security group being regarded as one of the top research groups in the country.

Fifteen years ago, it would have been difficult to imagine how deeply dependent Americans would become on the Internet and network-based technologies—and how vulnerable because of them. “Computer security was quite underdeveloped in academic institutions prior to 2000, except for the areas of cryptography and secure network protocols,” says Stolfo. “Today, if you think cryptography alone is the answer, you don’t know the problem.”

Through his persistence and insistence, the Computer Science Department began to hire new faculty to broaden the areas of security research, establish a strong educational program in computer security, and build a faculty with similar and related interests. The core group of Columbia researchers who work with Stolfo includes Professor Steven M. Bellovin, a member of the National Academy of Engineering formerly with AT&T Labs Research, Associate Professor Angelos Keromytis, and Assistant Professor Tal Malkin.

Working with them in interdisciplinary efforts are Professor and Department Chair Henning Schulzrinne, Professor Gail Kaiser, Associate Professors Tony Jehara, Jason Nieh, Mishal Misra and Dan Rubenstein; Assistant Professor Simha Sethumadhavan, and Adjunct Senior Research Scientist Moti Yung. These faculty members form Columbia’s Systems Security Center that researches network systems security to provide responses to anomalous conditions and malicious attacks.

“We now have a group of talented faculty that focuses on hard problems to secure our computing infrastructure and our own personal computing devices that we depend upon as well as to make the Internet a safe place,” Stolfo says. Over the last five years, the group has won grants and awards that total more than $11 million.

Bellovin, Keromytis, Malkin and Stolfo’s most recent grant, for nearly $650,000, is to investigate how to search databases using a method that protects both the querier and the subject of the query. It is essential to find a solution that will serve law enforcement and intelligence agencies without violating civil liberties. Stolfo says the group already has an algorithm, an approach, and an elegant system with which to demonstrate it, but there is still significant work to do. “The solution must be implemented in a manner that is efficient, because if you can execute only one query a day, it is not good enough,” he says.

An important component of the group’s research is developing sound mathematical foundations for applications requiring security and privacy by expanding the foundations of cryptography to withstand stronger, more realistic attacks. “Traditional cryptographic models are not sufficient for many current applications that take place in complex computing environments, such as the Internet, or on small portable devices that are easily tamperable,” says Malkin. To address this, the team has developed new solutions with provable security against various attacks, including side channel attacks, key exposure and tampering, and active and dynamic malicious adversaries.
“Each side is figuring out how to cripple each other’s systems. It is cyber-war.”

— Salvatore Stolfo
Professor of Computer Science
Director, Intrusion Detection Systems

The research of Columbia’s security team will make it safer to be on the Internet. Cyber-threats to the average American are well-known and come from multiple directions. From the credit card numbers stolen by hackers who place “keyloggers” on home computers to those taken from the databases of major retail chains, the average consumer is at daily risk. Columbia’s security researchers are not waiting for the attackers; they are studying new attacks. They have created an engine that generates polymorphic malicious code that looks “normal,” such as text. They devised this engine to understand how to defend against this advanced threat.

Polymorphic malware (malicious software) can be automatically recomposed to look entirely different. Hackers can generate a vast number of distinct instances of their malware to defeat current signature-based anti-virus scanners. The number of signatures a typical AV scanner would need is enormous, rendering the use of “black list” signatures unfeasible. The current generation of AV scanners that are commonly used are now obsolete because of this polymorphic threat.

But there is a solution. Instead of using the “black list” concept of checking against known viruses or worms, the approach is “white listing,” recognizing what is good and categorizing everything else as abnormal and suspect. Normal, good data is modeled by an anomaly detection (AD) algorithm and anything that does not fit within the parameters of the AD model is considered suspect and either deleted, not accepted, or tested further. The most recent virus scanners use end-point scanners and have partially adopted this “white listing” technique by emulating suspect data in a protected sandbox.

Keeping an individual’s computer safe from intrusion is a small problem compared to protecting the computers that provide the infrastructure to run the country. The risk to the nation is great and the stakes are far higher. It has been reported that cyber-attacks on U.S. government computer networks were up 40 percent over last year, with more infiltrators using more sophisticated malicious software to steal data or control critical systems.

Major intrusions were reported in systems controlled by the Departments of Defense, State, Homeland Security and Commerce. “Everything is now at risk,” says Stolfo. “The Internet does not just give us the ability to twitter or e-mail. It reaches critical networks that control the country’s critical infrastructure—electric power, water, chemical plants—all our infrastructure is accessible through the Internet.”

While businesses have made it easy to remotely access the IT systems operating at power plants for cost savings, this also has created enormous security problems. President Barack Obama has recognized this threat to national security and has included $355 million in cyber-security funding for the government’s 2010 budget. He also has mandated a review of the government’s current cyber-security programs and activities, appointing a new cyber-security chief, Melissa E. Hathaway, to conduct the review and report to the administration with recommendations.

Stolfo hopes that the report will highlight the importance of supporting significant basic and applied research into cyber-security. “There are too many opportunities for our adversaries to break into government systems and do bad things,” says Stolfo. “Advanced research is crucial to defend against this behavior. It really takes a lot of brain power. It is brain against brain. There are very clever, technically astute people who are malicious and driven by a profit motive out there and the defenders have to put themselves in the mindset of the bad guys and predict what they may do in order to prevent them from doing it. Only if we make the right investments will we win. Each side is figuring out how to cripple each other’s systems. It is cyber-war.”

To help educate the next generation of standard-bearers, the CS security faculty has more than 26 doctoral students specializing in computer security. In addition, it has established 10 courses that form the core of a new MS degree track in computer security. More than 30 current graduate students have chosen to concentrate in this track, while students in many other CS tracks are also enrolled in these computer security courses.
New Building for Engineering

The Interdisciplinary Science and Engineering Building rising on the northwestern-most corner of the Morningside campus received its “top” in December during a ceremony to put the final structural beam into place. President Lee C. Bollinger and other University representatives, including SEAS Vice Dean Morton B. Friedman, signed the beam before it was hoisted into its designated position.

The building will contain classrooms, faculty offices, and research space for faculty in engineering, biology, chemistry, and physics. An interdisciplinary approach to subject areas such as nanotechnology will benefit from having a facility that houses researchers from differing areas of specialty. Preliminary plans call for engineering faculty to have research space on at least two of the seven upper floors of the building that will house laboratories.

“We are looking forward to having this additional research space,” said Interim Dean Gerald Navratil, “so that we will be able to continue to attract and retain faculty by offering them a premier environment in which to carry out their work.”

The new building occupies the former tennis courts, the last developable site on the campus, and sits atop the Levien Gymnasium portion of the Dodge Physical Fitness Center. It is situated between Chandler Hall on the Broadway side and Pupin Physics Laboratory on the 120th Street side. There will be a street entrance on 120th Street. Two glass-enclosed spaces are planned: one for a café just above street level and the other on the top floor of the building.

The 14-story building was designed by Rafael Moneo, the Spanish architect best known for the Cathedral of Our Lady of the Angels in Los Angeles. The building is being built without any disruption to the Dodge Physical Fitness Center, the west end of which is directly beneath the new building. Three parallel trusses in the lower part of the building will take the weight of the floors above and distribute the load to columns that flank, but do not encroach upon, the underground basketball court of the Fitness Center. This engineering solution has created an open and unobstructed space under the trusses, which will house the science library.

CAD modeling of the campus level showing the new interdisciplinary science and engineering building in place. Chandler Hall is the building on the left. The Schapiro Center for Engineering and Physical Science Research (CEPSR) is on the near right, Pupin Physics Laboratory is adjacent to the new research building.
Sensing Danger in Bridge Cables

The Carleton Laboratory on the first floor of the Mudd Building is home to what Prof. Raimondo Betti calls “the beginning of a new era in infrastructure testing.” After more than two years of preparation, a simulated bridge cable 20 feet long, 20 inches thick and made up of nearly 10,000 galvanized bridge wires, enclosed in an environmental chamber to accelerate deterioration, is being subjected to a stress test. As the weathering chamber subjects the cable to accelerated aging, it is providing the means for Betti to measure the success of the method he has developed to monitor deterioration of bridge cables.

Betti’s goal is to develop a state-of-the-art corrosion monitoring system to be used in main cables of suspension bridges. Buried in the dummy cable are 76 sensors, several microphones, and two pre-corroded strands for blind tests. For six months, the cable will be subjected to a regimen that will simulate decades of wear for a suspension bridge, such as that endured by New York’s Williamsburg, Manhattan, and Brooklyn Bridges.

“New York City has among the oldest suspension bridges in the world,” says Betti, a professor in the Department of Civil Engineering and Engineering Mechanics. “Their cables have a life span of about 150 years and they will continue to deteriorate if nothing is done. If a cable goes, the entire bridge goes.” The city’s bridges are approaching an age that causes concern for their well-being: the Brooklyn Bridge is 126 years old, the Williamsburg Bridge is 106, and the Manhattan Bridge is 100. Betti estimates that the loss of a New York City suspension bridge would cost $10 billion. While replacing a cable is costly, about $100 million he says, it is much less than replacing the entire bridge.

His research is aimed at finding ways to safely extend the life of existing suspension bridges and is a collaboration between SEAS, Parsons Transportation and Physical Acoustics, and the Federal Highway Administration. The aging chamber in the Carleton Lab is the means to provide that answer. It subjects the cable to a schedule of water, heat from heat lamps, and cooling by an air-conditioner. At the same time, the cable is subject to the same tension as if it were stretched on a bridge: 1.2 million pounds, provided by hydraulic jacks.

The sensors Betti has developed are measuring corrosion rates, temperature, humidity, acidity, and chlorine content. The microphones will detect cracking in the steel strands. Readings from both the sensors and microphones are fed into a computer system for evaluation. Once the six-month test period is over, Betti will evaluate the results of what will be the equivalent of decades of outdoor exposure. The answers he finds should help provide a prescription to insure a longer life for all suspension bridges.

Join Professor Betti for a demonstration on Friday, June 5, at 2 p.m. To make a reservation, click the Alumni Reunion Weekend icon at www.engineering.columbia.edu.
“Dream Team” of SEAS Quants Discusses Financial Engineering

Nobel laureate Robert C. Merton ’66 (above, third from left) joined the director of the School’s financial engineering program, Professor Emanuel Derman (sec- ond from left), and Goldman Sachs director and University Trustee Armen A. Avanessians ’83 (above, left) in an informal and lively discussion about the future of financial engineering.

An audience of nearly 400 students and alumni listened intently as the trio, introduced by Interim Dean Gerald A. Navratil as the “dream team” of quants—quantitative analysts who apply numerical or quantitative technique to finance—discussed financial engineering and its future. Sanjay Verma ’90 (above, right), co-head of US Fixed Income Asset Management at Morgan Stanley, moderated the discussion.

While the current market condition is not a result of a failure of financial engineering principles, the panelists agreed that financial engineers can help repair the system.

“Financial innovation has been a driver for hundreds of years,” said Merton. “We should not let recent events sidetrack financial engineering.” Merton, who won the Nobel Prize in economics in 1997, is currently the John and Natty McArthur University Professor at the Harvard Business School. He was one of the School’s first students in the engineering mathematics program, now known as applied mathematics.

Derman talked about the public cynicism surrounding the current financial system and a need for “financial leaders with brains and principles.” “We keep waiting for a Churchill but they keep throwing us Chamberlains,” he said. Derman is a former managing director at Goldman Sachs and head of quantitative risk strategies in firm-wide risk prior to coming to SEAS as a professor in the Department of Industrial Engineering and Operations Research. He is the inaugural director of SEAS’s financial engineering program, and is well known for his work on the Black-Derman-Toy interest-rate model and as the author of My Life As A Quant.

Avanessians suggested that “financial engineering academia should take a broader role in public policy debates in the days ahead.” Reflecting that “there is no shame in being quantitative,” he offered a vision of a university curriculum that included courses like Accounting for Physicists. “We can’t solve the problems we’re facing with talk alone. We need engineers who can apply their quantitative and analytical skills to a variety of issues.”

Avanessians is director of Fixed Income, Currency and Commodities Strategies, Equity Strategies, Investment Banking and Financing Group Strategies, and GSAM Strategies at Goldman Sachs. He holds an MS in electrical engineering from SEAS, where he is chair of The Columbia Campaign for Engineering, chair emeritus of the SEAS Board of Visitors, and chair of the
“Financial innovation has been a driver for hundreds of years. We should not let recent events sidetrack financial engineering.”

— Robert C. Merton ’66

*Nobel laureate in economics*

Financial Engineering Steering Committee for the financial engineering program.

In discussing the subprime mortgage crisis, Merton said that the credit rating agencies were using models that were not expected to perform the function they were performing as a substitute for posting collateral in financial institutions with large derivatives portfolios. They were created in a simpler time, he said, and were to rate firms with mostly tangible assets like manufacturing plants and equipment. “The model was not complex enough,” he said, “and so the reality was not what the rating indicated.”

Derman said the School’s financial engineering program has responded to recent events by offering two new courses, *Foundations of Financial Engineering* and *A Guide to Financial Industry for Quantitative Professionals*. In addition, courses also can be taken in the School of International and Public Affairs and in the Business School. Students normally in the 12-month sequence for the MS degree now have the flexibility to take a summer internship and complete the course work in the fall term, graduating in December 2009. “We are aware of the changing environment and job market,” said Derman, “and we are making accommodations by offering more courses on asset management to prepare students for jobs on the buy-side. We try hard to prepare the students for the professional world, with courses by adjunct professors who work in the financial industry. We help the students with resume writing and have frequent Town Hall meetings to address their concerns.”

The panelists made additional suggestions for changes in the economic system, including recommendations for:

- data transparency;
- fair-value accounting;
- regulatory due diligence, including regulation of the shadow banking system;
- a National Capital Markets Safety Board, like the National Transportation Safety Board, that sends a team of experts to evaluate every major financial failure and to give a report that will help ensure it doesn’t happen again;
- an increase in financial engineering expertise on corporate Boards of Directors; and
- creating a sovereign wealth fund for U.S. companies so that assets do not go into the Federal Reserve or Treasury Department but are managed by professionals to maximize the return for risk instead of simply being a liquidator of those assets.

Armen A. Avanessians ’83, left, a director of Fixed Income, Currency and Commodities Strategies, Equity Strategies, Investment Banking and Financing Group Strategies, and GSAM Strategies at Goldman Sachs; Professor Emanuel Derman, middle photo, director of the School’s financial engineering program; and Robert C. Merton ’66, right, Nobel laureate and Harvard Business School professor.
SEAS Engineers Without Borders
Work in Ghana, India, Uganda

In 2003, four Columbia students founded the Columbia chapter of Engineers Without Borders. Since that time, the organization, part of Engineers Without Borders-USA, has provided a way for students to use the skills they have learned at SEAS to improve daily life for people in developing communities around the world. For the past few years, SEAS students have concentrated their efforts in Ghana, India, and Uganda. While the individual student volunteers have changed, the philosophy of the program and its goals have remained consistent.

“Our projects are sustainable, both environmentally and economically,” says Allison Schoeneck ’10, a financial engineering major who is this year’s CU-EWB president. “EWB spends a lot of time on project design to make sure that the technologies we implement will have a very small environmental footprint, and, wherever possible, we use our projects to help villages generate a sustainable, livable income.”

In addition, each project requires a high level of community involvement. “The villages we work with are actively involved in all aspects of the design, construction, and upkeep,” she says, “because, to sustain the project over time, they need to feel ownership of the projects and have a genuine desire to upkeep the infrastructure. We collaborate very closely with the villages to ensure that the projects we implement are something that is genuinely needed and will be appreciated and maintained.” This formula has resulted in a continuing relationship between CU-EWB in three areas of the globe—Ghana, India and Uganda.

CU-EWB’s second project was the installation of a six-stall latrine in the village of Obadan, Ghana, in 2005. The Obadan project was a case study for the pilot class Engineering for Developing Countries taught by Professor Patricia Culligan of the Department of Civil Engineering and Engineering Mechanics. In January 2006, SEAS students returned to Ghana to perform a site assessment in Sakyikrom, a semi-urban village near Accra that needs water and sanitation projects. The next year, SEAS students designed and installed a rainwater harvesting system on the roof of a school in Sakyikrom. Currently, the group is focusing on providing potable water to three rural villages in the area around Sakyikrom.

“These satellite villages have about 200 people in them,” says Shilpa Vadodaria ’10, a biomedical engineering major who is project manager for Ghana. “While Sakyikrom has water, these villages are in much poorer condition. The farmers spend much of their day getting water, so our goal is to find the highest point in each village, bore a hole down to the water table, and use a hydrant pump to get the water. It will then be divided, half to irrigation and half to a filtering system that will create drinking water.” Design teams are experimenting with inexpensive construction plans for household scale, slow-sand filters, low-budget irrigation systems, and improved waste management.

In addition to the Ghana project, EWB is refocusing its attention on Puranaguma, India, where students completed a micro-hydroelectric plant in 2008. The plant currently provides electricity for outdoor a household lighting, and will soon electrify an agricultural processing center, a library, a health center, and a battery-charging station. One of the students who helped design and build the plant is Craig Danton ’09, who, with Nimit Mehta ’09, is a co-project manager for this year’s initiatives.

“We are working on the problem of reducing the amount of smoke from cooking indoor wood-burning stoves,” says Craig. “They use logs that emit smoke and particulate matter and the children breathe this in.” To help remove this air pollution in their homes, the group is proposing two solutions: One is a low-watt cooker that is low-cost easy to manufacture, and easy to repair. Design is actually one pot within another with a high-efficiency heating coil attached to the inside pot. The tops of the two pots are sealed together so there is no convection current. The water in the inside covered pot is set on low power for a few hours and then turned up to boil once it is time to prepare dinner, which is usually rice. For homes without electricity, the solution is high-efficiency biomass cookstoves that will increase the airflow in the cooker to produce less carbon monoxide and particulate matter.

In addition, the India team is preparing to install four solar panels in a health care clinic hub. The panels, contributed by BP Solar, will be used to power a refrigerator to store vaccines and a laptop computer for community health worker. “The health care worker will be able to walk around the villages to see patients and, if he has questions, he...
use the laptop to contact doctors by e-mail for advice,” says Craig. Although he will not be working on this summer’s project teams, Craig plans to return to Purnagama on his own after graduation to see the micro-hydroelectric plant in action. An electrical engineering major, he has been admitted to Harvard Business School, where he will begin his studies following two years of work experience.

The third focus area for CU-EWB, and the newest, is Uganda, where students began working in 2007 to install multi-functional energy platforms (MFPs) in Soroti. Currently, the MFP is being used as a back-up generator at a secondary school. The engine is the design of Matt Bassinger, a PhD student in earth and environmental engineering who modified an engine to run solely on vegetable oil. For Soroti, the oil is produced from the seeds of a local plant, jatropha. Matt will be returning to Soroti next month to install two new MFPs.

“Jatropha may be the next hot biofuel,” says Janelle Heslop ’10, project manager for Ugandan. “It is not edible so it does not have an impact on the food supply, it is readily available, and locally grown in abundance.” She will be part of an assessment team this summer that will go to Soroti to look at both water and health care needs. The team will evaluate water resources and needs, and perform water-quality testing.

Janelle is looking forward using her water assessment experience in Soroti. “I’ve been involved in water projects since middle school, when I worked with the Hudson River Museum in Yonkers,” she says. An earth and environmental engineering major, she has a minor in chemical engineering, and is focused on sustainable energy “because it is fascinating.”

In addition, the Uganda team will look at public health care. “The community has health needs, too,” she says. She expects to shadow the health care professionals at Pilgrim’s medical center while also assisting in their health program, “Move on Malaria,” an initiative to eradicate malaria region by region.

As CU-EWB president, Allison coordinates the organization’s fundraising to support all the projects. “The projects are scalable,” she says, “and so, the more money we have, the bigger we can make the projects. Almost all the money we raise goes for supplies and local labor since we ourselves pay much of the transportation costs to the site.” To contribute to any of the CU-EWB projects, e-mail cu-ewb@columbia.edu.

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**Rodriguez, Gonsalves Speak to Alumni Groups**

Two prominent alumni, Marcos Rodriguez ’83 and Gregg Gonsalves ’89, were each keynote speakers during the inaugural gathering of now-annual events for Hispanic and African American alumni sponsored by the School in coordination with the Society of Hispanic Professional Engineers (SHPE) and the National Society of Black Engineers (NSBE).

Rodriguez, founder and managing partner of Palladium Equity Partners, LLC, spoke at a networking event to connect Hispanic students with alumni. He noted that his involvement in the leadership of SHPE and the University Senate as a SEAS student prepared him for the challenges of starting his own company. He urged the attendees not to wait until they are more established to get involved in volunteering and philanthropy. He said his time at Columbia shaped his philanthropic passions of access to education, healthcare, and the Hispanic community. Rodriguez’s company has more than $1 billion of committed equity capital. He and his sister, Ana Rodriguez ’86, ’88, created the Rodriguez Family Junior Faculty Development Fund.

Gonsalves, a managing director at Goldman Sachs, spoke at a similar networking event for African American alumni, students and faculty. Gonsalves, who holds an MBA from Harvard, is sector head of the Aerospace & Defense Group. He told his audience to “find your passion and pursue it.” He also encouraged his listeners to network, keep up relationships, and remember that interactions with others will leave a lasting impression. He also noted that gatherings of alumni and students from organizations such as NSBE and SHPE can serve as important networking opportunities that build your personal brand.

Shown at the NSBE event at the Columbia Club, from left to right: Assistant Dean of Diversity and Faculty Development Fredrik Palm; Interim Dean Gerald Navratil; guest speaker Gregg Gonsalves ’89; NSBE alumni relations chair Sabine Louis ’11CC, and NSBE president Ken Yearwood ’09.
Fostering the Spirit of Entrepreneurship at SEAS

The C.P. Davis Auditorium was jammed with students and young alumni as the culture of entrepreneurship manifested itself at Columbia. Almost 200 spectators and 41 enthusiastic, budding entrepreneurs flocked into the SEAS auditorium to take part in the first “PitchFest,” organized by the School’s Center for Technology, Innovation and Community Engagement (CTICE).

Drawing idea-laden students from across many University schools, the PitchFest showcased products that ran the gamut from highly technical to highly practical. Olga Cooperman from the School of Continuing Education proposed a way to use plant technology to screen for drug toxicity early in the drug development process, while Meena George ’03, PhD ’08GSAS, now a student at the Medical School, pitched an online computer software program that will provide research laboratories with a way to minimize waste of laboratory reagents by creating a secondary market.

Many SEAS participants focused on computer-based products and applications. SEAS students were inclined to develop technical products, often computer-based, such as real-time translation software for 18 different languages proposed by Fred Rassam MS ’08, and a searchable-by-sound musical database proposed by Michael Mandel MS ’06, PhD ’09.

One new design that received hearty audience endorsement was Business School student Jennifer Wright’s environmentally-friendly pizza box made from 100 percent recycled materials that breaks down into serving plates and a convenient storage container for the left-overs.

Neil Sarkar ’07SEAS, and his partner Ricky Joshi ’06BUS, created FanDome.com, a social sports web site centered around sports teams, featuring videos, news and blogs, and are looking for investors.
“PitchFest was an extremely successful first step in the School’s effort to build a culture of entrepreneurship,” says Rebecca Rodriguez, senior associate director for entrepreneurship at CTICE. “Students have become vital, irreplaceable drivers of entrepreneurship training at SEAS. And our alumni have jumped on board wholeheartedly, too, helping organize and promote all our entrepreneurship efforts.” Science and Technology Ventures and the Business School's Lang Center for Entrepreneurship co-sponsored PitchFest. Student group sponsors were the Society for Entrepreneurship and Technological Innovation, the Columbia Entrepreneurs Organization, the Columbia Organization of Rising Entrepreneurs, and the Entrepreneurship, Leadership, and Consulting group.

A follow-up entrepreneurship event in March featured a business/technology demonstration that gave participants feedback on their business plans. Nine student venture presenters gave five-minute presentations on their businesses, followed by five minutes of feedback from the audience and a panel of experienced entrepreneurs. Alexandra Piol ’79, ’83 and Omar Jaffrey ’87 served on the panel of evaluators.

“This latest event was a great educational opportunity for students who plan on entering the Columbia Venture Competition,” says Rodriguez. “The feedback given by our panelists was of direct value to each of them. We are all looking forward to the Competition. I know we will be seeing some very strong new business ideas.”

Entrepreneurs entering the Columbia Venture Competition have a chance to share $25,000 in prize money and to receive in-kind support so they can turn their ideas into reality. “Entrepreneurship is important enough to join teaching and research as part of the mission of the School,” says Interim Dean Gerald A. Navratil, “and so we are providing the resources that are needed for the program.”

“Our focus on entrepreneurship at the Engineering School incorporates two important aspects that are absent from most programs,” says Rodriguez. “We support efforts to develop and implement green technology, and we have a long-range plan to build community engagement into every aspect of the program.”

The winners of the Competition will be decided by a panel of judges who will include members of the School’s Entrepreneurship Advisory Board. The Board, formed last year, acts as a resource for the Engaged Entrepreneurship Program, which is under the aegis of CTICE.

SEAS Becomes Site Of Harlem’s First Small Business Development Center

The Fu Foundation School of Engineering and Applied Science has become the first university to establish a regional small business development center (SBDC) in Harlem. It is also only the second academic institution in the country to have an SBDC tied to an engineering school.

Through this SBDC, administered by SEAS’s Center for Technology, Innovation, and Community Engagement (CTICE), small businesses in the Harlem community will be able to take advantage of the School’s existing community-based, academically-driven programming. Tapping the talents of Columbia students, business owners participating in the program will receive business counseling that covers management and technical assistance services from cost-analysis to Internet commerce to employee management.

At the helm of the new program is Alex Yepes, managing director of the Columbia-Harlem SBDC. Yepes, who was previously with Columbia’s Center for Career Education, will be working with the University’s Office of Government and Community Affairs and the New York State SBDC, and coordinating support from the Business School, the Law School’s Nonprofit Organizations/Small Business Clinic, and the School of Social Work’s Center for Social Policy and Practice in the Workplace.

“We have received a great deal of support from the New York State Small Business Development Center, which oversees all regional centers,” says Yepes. “It is encouraging to see that New York State leaders understand the potential that universities such as Columbia can bring to community development. Being among a cohort of experienced, successful entrepreneurs has been invaluable to us. This will provide a rich, unique academic opportunity for our students. The range of business ventures, scope, and opportunity for impact is broad, and our students have really risen to the challenge.”

Within a relatively short period of time, the Columbia-Harlem SBDC has begun to empower the next generation of Harlem entrepreneurs, says Yepes. “We are fortunate that the combination of resources from SEAS and from the SBDC allows our program to offer small businesses a unique opportunity to create, stabilize, and grow in this difficult economic period.”

Go to CTICE at: http://ctice.columbia.edu
Graduate Student Services Launches New Web Site

The Fu Foundation School of Engineering and Applied Science has launched a new Web site for Graduate Programs. The new site will provide better access to information for prospective students and others, says Tiffany Simon, Assistant Dean of Graduate Admissions.

“I am extremely excited about the launch of the new graduate programs Web site,” says Simon. “Prospective, new and current students will find the new site to be user friendly, student centered, and more interactive. More importantly, students will be able to access the information that they need more efficiently.”

The new site features videos and profiles of current students, in addition to the wealth of information students need to navigate through their programs.

One of the first featured profiles is of Mitchell Morris PhD’10 (right), a native of Harrison, N.Y., who received his BS in computer science from McGill University in Montreal. He decided he wanted to become an engineer by using the same kind of methodical approach engineers use in their work.

It was a step-by-step process rather than a singular moment of epiphany, he said. His passion for computer science began before he was in high school, when his mother, a mathematics professor, brought home a graphing calculator. He learned how to program the calculators in their own BASIC-like language, and he and a friend programmed formulas from their math classes and installed games on the calculators. “By the time I applied to college, there was no doubt in my mind that computer science was the path for me.”

“When I was in high school, I was part of the Columbia Science Honors Program,” he says. Because of his familiarity with the campus, and dreams of living in Manhattan, he entered SEAS as a one-term special student, a program for those who are not yet certain they want to pursue a graduate degree.

Once he was here and taking two classes, it didn’t take Mitchell long to decide. He has already begun using his experiences on campus in the workplace. “I am using what I have learned all the time,” he says. “In my internships at IBM, I have applied the software engineering skills; at my internship at Credit Suisse, I apply the independent problem-solving skills that I have developed during my research time. In my game design hobby, I apply the concepts that I learned in the video game design courses.”

See the new Web site: engineering.columbia.edu/graduateprograms
SEAS in California

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EAS Interim Dean Gerald A. Navratil, Professor Patricia Culligan, and other SEAS and University representatives traveled to California to join with alumni there in welcoming West Coast members of the Class of 2013. The School hosted receptions at Yoshi’s in San Francisco and at Spago in Los Angeles for nearly 300 alumni and admitted early decision students who are part of the incoming first-year class.

Dean Navratil spoke about the progress of the School and shared the impressive statistics from the Admissions Office. Early decision applications were 20 percent greater than last year and regular decision applications also increased more than 20 percent, both setting new records.

Professor Culligan of the Department of Civil Engineering and Engineering Mechanics gave an overview on Urban Sustainability, Can We Engineer It? “By 2030, two out of three people will live in an urban environment, with most of the explosive growth occurring in developing countries,” she said. New York City is ranked fifth in population in the world’s megacities, and SEAS faculty members are working to solve the challenges of decaying infrastructure, restoring the environment, and forestalling an energy crisis.

“The amount of electricity consumed by Columbia University is comparable to that of a medium-sized town,” said Culligan. Columbia has pledged to decrease its carbon dioxide emissions 30 percent by 2017. One way is through the green roofs projects started by Culligan, while another is aimed at reducing consumption of electricity on campus.

Alejandra Jimenez, a senior at Francis W. Parker School in San Diego, (see photo below) was among the Californians admitted to SEAS early decision. “When I received my acceptance, I was excited beyond belief,” said Alejandra, known as Alie. She also was accepted into the scholars program. “Having such incredible opportunities is overwhelming, but very exciting.”

Alie plans to major in computer science, which she feels will combine her love of logic and rationality with her passions for the visual and performing arts. She is on a robotics team, in theater and the performing arts, and enjoys painting, drawing, knitting, sewing, digital art, jewelry making and baking. Computer science, she says, will allow her to “create a fantasy videogame featuring characters of my own device, program innovative recording software, or realize an infinite number of other possibilities.”

Isabelle Elias (see photo at right), a senior at St. Ignatius College Preparatory School in San Francisco and now a member of the SEAS Class of 2013, was considering 10 schools, including the UC’s, Stanford, and schools known for their engineering programs. “I was attracted to Columbia SEAS because of the high percentage of female students, the Core, and New York City. Columbia SEAS was the only school that I thought would educate me as a whole person,” she said. Isabelle is on her school’s varsity swim team, is president of the astronomy club, acted in the comedy club’s annual show and led a four-day senior retreat with eight of her classmates. She also spends most Friday mornings at a local soup kitchen in a program sponsored by her school.

Both Alie and Isabelle visited the campus and immediately knew it was where each wanted to be. “I fell in love with the campus, the atmosphere, and the city of New York during my visit,” said Isabelle. Alie’s reaction was similar. “I was very excited to learn that all students live together, in contrast to many schools where the engineers are essentially separated,” she said. “I can’t wait for the fall term to start!”
Working in a virtual world may be the hot new trend that delivers on what it promises: a way for global engineering teams to successfully manage and execute complex design and construction projects. He created the course to expose students to the kinds of challenges they will face working on global engineering teams but also to expose them to emerging technologies he is developing in his Project Network Dynamics Lab to address some of the challenges.

All students are working in a virtual working environment called the CyberGRID (Cyber-enabled Global Research Infrastructure for Design), which was developed by Taylor’s research team in collaboration with Professor Riitta Smeds and researchers at the Helsinki University of Technology. “The CyberGRID is to support working, not meeting,” says Taylor.

“Most efforts to use virtual worlds in commerce involve meetings. Our vision is to use the CyberGRID to support the complex and concurrent modeling efforts of a globally-distributed team.”

Gartner Research predicts that, in two years, 80 percent of active Internet users will have an avatar presence in a virtual world.
Many companies are already on the virtual bandwagon. *Infor – nation Week* reports that Cisco Systems has hundreds of employees in Second Life, a free, online virtual world. Even NASA is using virtual worlds to support engineering meetings in their organization. The NASA CoLab is a space developed by NASA for its globally-distributed engineering and scientist network to meet and discuss projects.

All the students in Taylor’s course on Strategic Management of Global Design and Construction have an avatar and each of the global engineering student teams has its own meeting room. The TeamWall tool provides the space to share models and to spot integration problems. Students can share the model they are developing on their desktop at Columbia via the TeamWall.

Then they can discuss the impact their model output might have on the other models concurrently being developed by the Indian or Dutch students. “This technology supports the work of all the teams and helps resolve conflicts,” says Taylor. “There are many benefits of shared space because it allows these teams from around the globe to all discuss and resolve issues on the project at the same time.”

During the semester, students must work with each other to develop three intervention strategies to alleviate schedule and/or cost overruns, quality risks, spatial conflicts, cost issues, and resource shortages to optimize the construction sequence. The intervention strategies should be actual strategies a project manager might employ to solve the identified problems. In fact, the students must present their findings to the project manager and include the results of that discussion with their final project report.

Taylor’s Sloan Industry Studies Fellowship supports his work that tackles the emerging problem of how global project teams with a multiplicity of disciplinary, cultural and institutional boundaries codify and negotiate complex design knowledge using advanced modeling tools. His approach uses a combination of in-depth field research, lab experimentation, and computational simulation modeling to extend theories of project networks while developing relevant organizational change strategies and technologies to support cross-boundary adaptation.

“I am pleased that the Sloan Foundation and the National Science Foundation see the value in examining design and construction globalization issues,” said Taylor. “The CyberGRID and the TeamWall have the potential to reshape how many types of complex projects—not just design and construction projects—are executed. I am glad to have the opportunity at Columbia to tightly integrate my research and pedagogical activities and to prepare engineers to meet the current and future challenges of working globally. Starting this summer we hope to involve visionary design and construction firms working globally in the CyberGRID research.”

Lambrecht Named As New Director Of Global Initiatives and Education

As part of SEAS’s long-range plan to become a global engineering school, the School has taken a first step by hiring Régine Lambrecht to the newly-created position of director of global initiatives and education. Lambrecht, who holds a PhD in French literature, was head of international relations at Ecole Centrale de Lyon, a French engineering university, for more than 15 years before returning to the U.S. to take a position as director of international education at Quinnipiac University.

“We are very pleased that Régine has joined Columbia SEAS,” said Gerald A. Navratil, Interim Dean. “Her experience with education at the international level will be invaluable to us as she develops and manages a new global initiatives program. Her familiarity with engineering, its academic requirements, and the scope of faculty research, are a great advantage.”

For many years, the School has had informal connections with other global institutions, primarily through its faculty. These faculty associations, formed on a personal level, have resulted in many successful collaborations with institutions in more than 20 countries. The School now will be able to formalize those programs and partnerships and foster new ones.

“My first step is understanding and evaluating the international connections we have now,” she said, “and determining priorities for approaching international institutions of the highest caliber to initiate collaborations.”

Lambrecht has begun that work, targeting six institutions, from Europe to Asia. She is working with SEAS faculty to establish course equivalence tables so that it will be much easier for SEAS students to determine which courses taken at partner institutions can be transferred to Columbia.

Lambrecht also will work with current University programs at the international level, coordinate efforts to encourage exchange programs for SEAS students, foster international faculty research, and create new international partnerships. She will be the primary coordinator for international student exchange programs and will be a resource for departments seeking to create new international departmental programs. She also looks forward to creating international content pages on the SEAS Web site.
Chen Wins PECASE Award

Associate Professor Xi Chen of the Department of Civil Engineering and Engineering Mechanics has taken fruits and vegetables off the table and put them in the laboratory. The fruits of his research resulted in his being named a recipient of the highest honor that any young scientist or engineer can receive in the United States, a Presidential Early Career Award for Scientists and Engineers (PECASE).

Chen was among 67 researchers nationwide, and one of 20 National Science Foundation (NSF) nominees, to receive this national award. It was given “in recognition for his outstanding research involving mismatch damages in thin-films and nano-scale self-assembly,” and was presented at special White House ceremonies in December by then-President George W. Bush. He is shown above, center, with NSF Deputy Director Kathie Olsen, left, and Science Advisor to the President John H. Marburger III.

Chen and his research group, using engineering mechanics principles, have provided the first explanation for why some fruits and vegetables, such as cantaloupes, pumpkins, and bell peppers, are characterized by distinctive skin patterns. “Many spheroidal-ly-shaped fruits and vegetables have distinct ridges, ribs or mottled patterns,” says Chen.

“For instance, the Korean melon, ridged gourd, small pumpkin, and acorn squash have 10 equidistant longitudinal ridges that run from stem to tip; a large pumpkin has about 20 ridges. Striped cavern tomatoes and bell peppers have four to six ribs that characterize their unique appearances, while cantaloupes show a reticular morphology that mixes ridged and latitude patterns.”

Chen’s group has come up with an explanation for these ridged characteristics by using the buckling principles of engineering mechanics. “The distinct appearances of some natural fruits and vegetables are governed by simple mechanical principles. Because of mismatched deformation between the shell (skin) and core (flesh), the excessive growth of the shell could induce buckling and serve as a template for subsequent growth,” he says.

Chen believes that this research is also highly relevant to a number of systems in animals and cellular biology, despite the many biological and biochemical factors that also are involved. “Our work implies that what might be thought of as merely a work of nature is, in fact, a result of simple mechanical principles.”

In addition to research on ways to control the mismatch damage of thin films, Chen explores mechanobiology, nanomechanics, nanoindentation, mechanical self-assembly, small material structures, and multi-scale and multi-phase computational mechanics. He also has pioneered new materials that absorb energy. He joined Columbia University in 2003 after receiving his PhD and postdoctoral training from Harvard University. He has published more than 130 peer-reviewed journal papers, many of which were in high-impact journals and several were featured as cover stories.
Five Young Faculty Members Win NSF’s CAREER Awards

Five SEAS assistant professors have received the National Science Foundation’s prestigious CAREER Awards, given to young researcher-educators to support their novel research. The recipients are: José Blanchet, in the Department of Industrial Engineering and Operations Research; Marco J. Castaldi and Kartik Chandran in the Department of Earth and Environmental Engineering; V. Faye McNeill, in the Department of Chemical Engineering, and Nabil Smaan, in the Department of Mechanical Engineering.

José Blanchet

José Blanchet’s grant will support research to provide new tools for risk assessment for the financial markets.

“Events such as environmental or natural disasters, major market crashes, pension and insurance breakdowns, and terrorist attacks are rare but consequential events,” says Blanchet. “I hope to develop new and efficient computational tools for risk assessment of rare events that exhibit features such as heavy-tails, complex dependence and incorporation of combinatorial objects.”

“Efficient evaluation of rare-event probabilities can provide decision makers with key quantitative policy assessment metrics and insights,” he says. Examples include assessing ruin probabilities for purposes of sizing the capital reserve of insurance and financial companies and computing the probability that a target is able to evade a set of detectors as well as its conditional most-likely location.

Blanchet will develop a framework that exploits asymptotic analysis, expressed at a coarse scale, to systematically generate efficient rare-event simulation algorithms for complex stochastic systems, which must necessarily be implemented at a fine scale. Blanchet’s proposal, *Efficient Monte Carlo Methods in Engineering and Science: From Coarse Analysis to Refined Estimators*, will receive $400,000 in funding.

“My strategy consists in connecting large deviations analysis with algorithmic design of efficient simulation estimators,” says Blanchet. “One key tool that I will employ in the design and performance analysis of these algorithms is a systematic use of Lyapunov bounds for Markov chains, combined with parametric families of importance sampling distributions.”

He will study five types of environments that exhibit stylized features that have not been well studied in rare-event simulation. They are: 1) stochastic recursions with heavy-tails, which are used to model insurance risk and reservoir processes; 2) heavy-tailed queues, which arise in database and networking applications; 3) counting problems and inference for combinatorial structures, which arise in sociology and biology; 4) location of objects immersed in a random medium, with a particular emphasis on military applications to find targets that have eluded detection for a long period of time, and 5) random fields, which arise in oceanography, environmental studies and medical imaging.

Marco J. Castaldi

Marco J. Castaldi, assistant professor of earth and environmental engineering, will investigate the chemical kinetics and mechanisms of catalytic reactions by combining a high pressure shock tube, normally used for homogeneous reaction analysis, and adapting it to study heterogeneous reactions. In the process, he has created the first-ever catalytic shock tube. This research holds the promise of under-
standing the reactions to efficiently produce synthesis gas—a gas used as a feedstock for clean liquid fuel production—from greenhouse gases.

“This technique will resolve the mechanistic uncertainties that have evolved using conventional continuous flow systems,” he says. For example, this new technique will provide a way to detect and quantify key oxygenated intermediates, such as methanol and formaldehyde, to guide the design of new reactors to produce synthesis gas, or syngas, in a more efficient manner. “Resolving these uncertainties should lead to potentially significant impacts on energy generation, the quality of the environment, and efficient catalytic reactor technology development.”

Castaldi’s new technique incorporates a catalyzed short contact time (SCT) reactor substrate and a shock tube that can operate at targeted pressures and temperatures, reproducing actual operating conditions. This combination of SCT reactor and shock tube enables the study of the mechanism of complex heterogeneous reactions over a catalyst for well-defined times and conditions. By understanding these processes using the catalytic shock tube, there will be a much smoother scale-up from the lab environment to industrial applications, where high pressures are necessary for increased process throughput.

“This innovative technique will investigate the chemical kinetics and mechanisms of environmentally important catalytic partial oxidation reactions and greenhouse gas reforming reactions,” says Castaldi. “First, it will add to our understanding of the mechanism of catalytic partial oxidation of methane to synthesis gas, and second, it will help to optimize the process of reforming methane to reduce the amount of greenhouse gases in the air and, hopefully, identify paths for the beneficial utilization of these gases.”

“The attributes of the apparatus center on eliminating transport interactions, thus allowing intrinsic kinetic data to be obtained. It will provide a true step change from ambient to the desired reaction conditions for precisely defined time durations for well characterized, real catalytic reactors. Moreover, it has the capability to conduct temperature- and pressure-jump relaxation experiments. Currently there is no other gas-solid chemical kinetic method that can achieve this,” says Castaldi.

Kartik Chandran

Kartik Chandran, assistant professor of earth and environmental engineering, will be researching molecular mechanisms and metabolic modeling of nitrous oxide and nitric oxide emission fluxes from biological nitrogen removal reactors. His research centers on engineered wastewater treatment technologies that are enabled by environmental microbiology and biotechnology.

Chandran’s preliminary research has shown that biological nitrogen removal (BNR) processes in wastewater treatment plants may, in fact, produce gases that are environmentally hazardous. This NSF project will characterize nitrous oxide (N₂O) and nitric oxide (NO) emissions from wastewater treatment plants at the molecular mechanism and metabolic modeling levels and will complement the multi-agency funded Wastewater Treatment and Climate Change program of the Kartik Chandran Laboratories that aims to characterize N-GHG emissions from wastewater treatment plants around the world.

“My research goal is to develop BNR technologies that will improve water quality, but not at the cost of deteriorating air quality,” Chandran says. “The greenhouse impact of nitrous oxide is about three hundred times that of carbon dioxide. In addition, nitric oxide is converted to nitrogen dioxide in the atmosphere, and that is one of the primary constituents of the orange smog present during peak air pollution events in urban areas.”

Chandran is collaborating with colleagues at Technical University-Delft in The Netherlands on a complementary project to find the underlying molecular mechanisms that lead to N₂O and NO generation by nitrifying bacteria, which are key protagonists in BNR reactors.

V. Faye McNeill

V. Faye McNeill, assistant professor of chemical engineering, received her CAREER award to research a better understanding of the influence of ice and snow on atmospheric composition and climate. Her proposal, The Atmospheric Chemistry of Ice and Snow, will be funded for five years. Her plan is to address a major challenge in atmospheric chemistry: understanding and quantifying the interactions of ice and snow with trace gases.

“Ice in the environment, in the form of ice particles in clouds, or sea ice and snow at the Earth’s surface, has a profound influence on atmospheric composition and climate,” says McNeill. “A quantitative physical understanding of trace gas-ice interactions is critical for predicting the effects of climate change on atmospheric composition, for the inter-
interpretation of ice core chemical records, and for modeling atmospheric chemistry.”

“There are significant gaps in our current understanding of the uptake of gases by ice, including uncertainty regarding the microphysical location of adsorbed species and the potential role of a quasi-liquid or quasi-brine layer at the ice surface,” says McNeill.

“The McNeill Group will apply a set of powerful, complementary experimental and modeling approaches in order to gain new chemical and physical insight into these gas-ice interactions in the environment and their effects on atmospheric composition.”

The results of these studies will enable researchers to more accurately constrain the effects of snow and ice chemistry on atmospheric composition for use in coupled atmospheric chemistry–Earth system models. The group’s research efforts will be complemented by an integrated education and outreach program designed to help New York City students from kindergarten through high school better understand the science behind our changing environment.

**Nabil Simaan**

Nabil Simaan, assistant professor in the Department of Mechanical Engineering and director of the Advanced Robotics and Mechanism Applications (ARMA) Laboratory, received his CAREER Award to advance his work developing novel, flexible snake-like robots and parallel robots that will improve success of future minimally invasive surgery paradigms. These robots will gauge their force interactions with the patient’s anatomy, gather information, and then act on that information.

One of the latest surgical paradigms is NOTES, Natural Orifice Trans-luminal Endoscopic Surgery, which uses the natural openings in the body to reach the affected organ and perform surgery on it. Unfortunately, current surgical systems are bulky and cannot support these new surgical paradigms. There is a need for new down-scalable surgical robots that provide access to the deepest anatomical organs with minimal damage to surrounding anatomy. For example, one could think of performing surgery on the abdomen by reaching through the patient’s mouth, past the esophagus, and through an incision in the stomach. Such robots will be of little use if they are not equipped with some basic forms of intelligence — another aspect addressed by Simaan’s CAREER proposal.

“My surgical robots will be able to perform many other surgical functions,” says Simaan, “and they will safeguard against damage to the anatomy by acting as intelligent intervention and information-gathering tools for assisting surgeons during increasingly complex procedures. The objective of this research is to provide the theoretical foundation for modeling and control of flexible robots for intelligent and safe interaction with the anatomy.” “Intelligence” in this case refers to the ability of these robots to gauge their force interaction with the anatomy, gather information about the anatomy, and act based on this information, he says.

Screw theory and stochastic estimation methods are used for modeling the ability of these robots to estimate their wrench interaction with the anatomy by using intrinsic and extrinsic sources of information. These performance measures are used in hybrid force control algorithms that allow characterizing shape, stiffness, and anatomical constraints governing safe maneuvering of suspended organs.

“This research will advance the field of robotics by addressing control and resolution of multi-point contact problems for compliant insertion control and bracing against soft environments,” says Simaan. “It promises to revolutionize medical robotics by introducing novel algorithms for designing and controlling surgical robots capable of safe interaction and manipulation of the patient’s anatomy.”

To see current research, go to: [http://engineering.columbia.edu](http://engineering.columbia.edu) and select SEAS TV from the top navigation bar
New Archimedes Society
Honors Lifetime Giving

A rchimedes had his lever to move the earth while The Fu Foundation School of Engineering and Applied Science has the members of The Archimedes Society to move the School forward. Interim Dean Gerald A. Navratil noted that the significant financial support provided by the members of The Archimedes Society for Lifetime Giving has underwritten complete renewals of departments, provided professorships, fellowships, and scholarships, and provides an example for all alumni who love the School.

A celebratory dance party to launch The Archimedes Society was held at the W Hotel in midtown Manhattan in December, hosted by Armen A. Avanessians ’83 MS, University Trustee and chair of the School’s capital campaign. Avanessians, in photo left, welcomed nearly 300 Society members, faculty, alumni and students who attended the gala event. The Archimedes Society was formed to recognize lifetime giving to the School of $50,000 or greater. There are more than 180 inaugural members, many of whom were in attendance.

During a short interlude in the festivities, Dean Navratil led the audience in a toast to the Society’s members, present and future. Archimedes Society member Stanley Dicker ’61 Eng ScD, who has endowed a professorship and two scholarships for undergraduates, spoke about the importance of philanthropy that serves as a foundation for supporting the future growth of the School. He noted that, as a graduate student, the School provided him with financial support while he worked on his doctoral degree and that, in gratitude, he has chosen to significantly support some of the School’s most critical needs.
SEAS student leaders Whitney Green '10, Engineering Student Council (ESC) secretary; Peter Valeiras ’09, ESC President; Heather Lee ‘10 Class of 2010 President; Brian Moreno ‘09, President of Student Chapter of AIChE; Michael Fu ’09, Sophie Chu ’09, SGS Liaison to ESC and, in front, Huei Ong ’09, ’08CC, ESC member.

Hemant and Varsha Shah P’06, ’08, left, with Elizabeth and Jim Li ’68, ’70, ’76, P’06.

Sheldon Isakoff ’45, ’47, ’52, left, with Gemma and John P. White ’68, ’71GSAS, P’04CC.

From left to right, William ’81 and Mary Haney P’12; Deborah Haight ’00 and Stephen Specht ’00.

Barbara and Rodman Reef ’69, ’78, P’12CC, left, with Lauren Wong Sheng ’76.

From left to right, Anna ’49, ’52 and Guy Longobardo ’49, ’52, ’62; Rumi and Hitoshi Tanaka ’63, ’65, ’76.
slowed down or you are forced to find a new opportunity, it can really be a chance to do what you’ve been meaning to do.

Nai Nan Ko writes, “I can’t believe how quickly time flies. This May will mark our fifth anniversary. I was never the smartest nor the most achieved student at SEAS, but I do wear my CU sticker on the back of my car proudly. 

“I haven’t achieved much, only my new position as the General Manager of the Ko Automotive Group. Our annual sales surpass $65 million. We sell ~250 cars per month and service 200 customers a day. Currently, we are trying to be leaders in our community by giving back to education. We sponsor a “Leadership and Development Speaker Series” at an elementary school in Belmont. Our goal is to help parents become better communicators of morals and ethics to their children. You can learn more by visiting www.koautomotogroup.com.

“In the fall of 2007, I became a certified VFR private pilot and By Cesna 172SP. That’s about it. My life is pretty boring actually. Work, sleep, eat, and occasionally fly.”

2005

David Palumbo (MS) was selected as Reclamation’s 2008 Engineer of the Year in recognition of his outstanding achievements while serving as the Deputy Regional Engineer for Reclamation’s Lower Colorado Region. He served as the Project Manager for the Drop 2 Storage Reservoir Storage Project, which will conserve an estimated 70,000 acre-feet of Colorado River water a year to alleviate drought in the lower Colorado River Basin. He joined the company in 2005 after several years working for private engineering and construction related firms in Nevada and New York and was named Regional Engineer for the Lower Colorado Region in September 2008.

2006

Class Correspondent: Nick Jennings at nj2003@ca.a.columbia.edu

To have your news appear in the Fall 2009 issue, send it to Nick before Aug. 30, 2009.

2007, 2008

To volunteer as a Class Correspondent, or to have your news appear here, e-mail Margaret Kelly at mk321@columbia.edu before Aug. 30, 2009.

1941

Alfred T. Marinaro Sr. (MS), a consulting engineer in the electroplating industry, died on Jan. 23, 2009 in Morristown, N.J., after a short illness. Born in Newark, Marinaro lived in Madison before moving to Convent Station 15 years ago. Since 1959, he was a self-employed consulting engineer for A.T. Marinaro Associates for the electro-plating industry and was an adjunct professor of chemistry at the County College of Morris for more than 20 years.

A graduate of Newark College of Engineering, he earned his MS in chemical engineering from SEAS. A member of St. Thomas More Church in Convent Station, as well as of the Knights of Columbus, 4th Degree, he also served on the Boys’ Basket and on the 10 of Alhambra, Lions Club, and Unity Club of Verona. He was also past president and executive director of the Masters’ Electroplating Association.

He was featured in Who’s Who in Commerce and Industry, Who’s Who In The East, Who’s Who In Men of Science; Royal Marquis Blue Book; and was a recipient of the NISOD Awa rd for Excellence in Teaching at the County College of Morris. He received numerous awards, recognitions and was featured in several publications. He is survived by his wife, Gilda, a daughter, three sons, and five grandchildren.

1942

Howard E. Phillips of Melbourne, Fla., died on June 12, 2008. A native of Larchmont, N.Y., he studied civil engineering at SEAS and served as a lieutenant in the Army Air Corps as a maintenance and repair officer during WWII. Phillips participated in West Coast war efforts and was assigned to the Doolittle Raid in the Pacific Campaign. He then was assigned to multiple European missions. After military service, he returned to work with petroleum companies abroad, and worked in China and West Africa on engineering projects.

For more than 40 years, he worked at Texaco on refineries, service station construction projects and environmental protection efforts throughout New England. He retired in the late 1990s and enjoyed fishing and travel. He was predeceased by his wife, Jean Heiberg Phillips, and is survived by three sons, one daughter and 11 grandchildren.

Gino E. Zanoli MS’43, ’42CC, died in Oak Ridge, Tenn., on Sept. 22, 2008. A native of New York City, Zanoli graduated from Stuyvesant High School as an honor student at the age of 16, and attended Columbia University, where he earned a master’s degree in chemical engineering by the age of 20. Following his graduation, he worked as an engineer for two years. In 1945, Zanoli enlisted in the U.S. Army and served in the Philippines during World War II.

After the war, he returned to New York City and married Patricia McConnell, who had also grown up in Flushing. After the Zanolis had their first child, he pursued a medical degree at SUNY under the GI Bill. He graduated from medical school in 1954 and, because his growing family was his first priority, as it remained throughout his life, he sought a position compatible with this goal and accepted a commission into the Public Health Service. The family then moved to Oak Ridge, Tenn., with their three children where the young Dr. Zanoli pursued an opportunity with the Atomic Energy Commission’s Health Division.

In that capacity, he provided medical care to employees of the Oak Ridge National Laboratory. His commitment to quality patient care and preventive medicine resulted in his ultimately becoming the Medical Director of the Y-12 plant. After a 45-year medical career, he retired in 1999 and enjoyed spending time with his wife and grandchildren. He is survived by his wife, six children and eight grandchildren.

1943

Daniel Bass of Sarasota, Fla., formerly of Cranford, N.J., died Jan. 22, 2009. He had served in the Army Air Corps as a flight engineer, second lieutenant, in World War II. He received his BS degree from SEAS, majors ing in chemical engineering, and also was a graduate of Rutgers University. He retired as vice president at Bristol-Myers Squibb after 39 years.

He is survived by his wife of 67 years, Rose Coyle Bass, three sons, two daughters, and 10 grandchildren.

William Lawrence Macmichael ’43CC, ’49BS of Trenton, Maine, died Jan. 6, 2009, at his home following a long struggle with Alzheimer’s disease. At Columbia, Macmichael played varsity football, was elected to the honorary engineering society, Theta Tau, and served two years as class president.

When World War II started, he enlisted in the Army Air Force. In the spring of 1944, he received his commission and married Betty Jane Cudworth. Together they traveled to Victoria Air Field in California where he was stationed for a year before leaving for the Philippines and Okinawa. Upon his return home, he attended Columbia Business School and received his MBA in 1949.

He later joined IBM and remained with the company until his retirement. He and his wife chose Maine as their retirement community and designed and built their own home by the ocean in Trenton. Macmichael is survived by his wife, two daughters, a son, six grandchildren and his sister.

S. Newton Berliner MS’60 died Jan. 10, 2009 in Virginia Beach, Va. He was born in Yonken, N.Y., and attended Yonkers public schools before enrolling in Columbia. He received a BS in mechanical engineering, was drafted into the Army Air Corps and assigned to NASA (National Advisory Committee for Aeronautics), the precursor to NASA, at Langley Field in Hampton, Va. He returned to New York and enrolled under the GI Bill for an MS degree.

In 1952, he married Martha Dressner, a graduate biology student at Columbia. They left New York City in 1953 for Marblehead, Mass., where he became active in town affairs. He was a member of the town Board of Health and reportedly instituted the first recycling program in Massachusetts. A registerd professional engineer (PE) in Massachusetts, he worked for several defense contractors in the Boston area, including General Electric, RCA and Sylvania.

With the waning of the defense industry, he specialized in heating and cooling for large construction companies and worked on the design of space suits for the Army Quartermaster Corp. His first retirement was in 1983, when he joined his wife in Richmond and they bought their present home in Virginia Beach. He returned to work for Pancon, Brinckerhoff on a short assignment and later the civil service as an energy conservation consultant at PWC of the Naval Station, Norfolk.

For 10 years, he served as the neighborhood representative to the Navy on the pollution remediation board at Little Creek Naval Station. He was an actor, avid gardener and member and officer of the Ti Dwater Men’s Gar-
den Club. He also volunteered for the Sea Shore State Park Visitor Center, was president of the Baylak Pines Civic League and board member of the Anti-Defamation League of B’nai B’rith. He leaves his wife, Mantha, a retired medical school professor; a daughter and son, granddaughter, and several nieces and nephews.

1949

Alvin Stanley Kawecki, of Milwaukee, Wis., died Dec. 10, 2008. Born in New York City, Kawecki was a WWII veteran serving on the USS LSM 220 in the Pacific. A graduate of SEAS with a BS degree in civil engineering, he owned his own business building custom homes. His passions were boating, fishing, reading, building, gardening, music, and cards, of which poker was his favorite. A lifelong animal lover, especially of cats and dogs, he always had one as part of the family. He loved living near the water and spent every summer of his life enjoying it with his family. In 1980, he and his wife Harriet moved to the retirement home he built in Water Mill, N.Y. He is survived by his wife of 59 years, three daughters, a son and six grandchildren.

1950

Arnold D. Halporhn Jr. of Marlboro, Mass., died at home on Nov. 27, 2008. A native of Philadelphia, he grew up on the upper west side of Manhattan, graduated from Lincoln School in 1943 and was immediately drafted into the Army. He served in the 103rd Infantry and saw action in Italy, Germany and Austria. Following his service, Halporhn studied mechanical engineering at Columbia and graduated in 1950. He worked in the electric power industry for Combustion Engineering in New York and Stone and Webster Engineering in Boston. He was especially proud of the Wysocki plant in Gillette, Wyo., and the Sears Island station in Maine. In 1962, he met Linda Fielding on a ski trip with the Appalachian Mountain Club and they were married in January 1963. They moved to Marblehead that same year and raised their two sons. He retired in 1987. Halporhn was an avid astronomer and world traveler and in later years a generous patron of many worthy causes.

Nicholas S. Rahal of Watertown, Conn., died Feb. 21, 2009 about the Royal Caribbean Cruise Line’s Explorer of the Seas. Born in Akron, Ohio, he grew up in Danbury graduating from Danbury High School in 1939. In 1940, he joined the Connecticut National Guard. He graduated from Officer Candidate and Communications School in 1942 and in 1943 joined the 36th Division of the Texas National Guard. He was part of the initial landing in Europe during World War II at Salerno, Italy, and was a POW, captured by the Germans in 1944 at Monte Casino. He was an OFLG 64 prisoner in Poland and forced to march from Poland to Germany in 1945. During this march, OFLG 64 was liberated by the Russians and Rahal managed to escape both the German and Russian Armies. He graduated from SEAS with a BS in electrical engineering in 1950. That same year, his National Guard unit was reactivated during the Korean War. After the Korean War, he worked at the National Bureau of Standards. While there, he received a joint patent for Plating Thickness Indicator in 1954. He worked for Data Control Systems from 1958 to 1983. In 1978, he received his MBA degree from the Univerity of Connecticut.

Rahal left DCS in 1983 and started his own company, Infotronics, Inc., from which he retired in 2002. Prior to his death, he was in the process of self publishing his memoir, The Life of Nick Rahal, Ex-PW-World War II.

Leif Rongved Ph.D ’54, of St. Petersburg, Fla., died Feb. 14, 1954. A native of Norway, Dr. Rongved came to the U.S. in 1946 to study at Columbia, where he earned a BS, MS in civil engineering, and PhD. He was assistant professor at Penn State University from 1954 to 1956, a member of the Industrial & Professional Advisory Council at Penn State University (1962 to 1972), and a member of the Technical Staff at AT&T Bell Telephone Laboratories (1956-1985), where he earned the Distinguished Technical Staff Award in 1984. He published extensively in the fields of mathematical theory of elasticity, fluid mechanics, and mathematical physics. He is survived by his wife Thelma, two daughters, a brother, five grandchildren and two great grandchildren.

James T. Hebron of Garden City, N.Y., died Jan. 2, 2009 after a long illness. He attended LaSalle Military Academy, Hofstra College and NYU Law School, until his dreams of law were interrupted by WWII. He was drafted and sent to Princeton University where he studied advanced engineering as an Army specialist. He was assigned to the 69th Infantry Division and was shipped overseas, where he fought in the Battle of the Bulge. His actions there earned him the Bronze Star with cluster, the Purple Heart and the Combat Infantry Medal. Upon returning home, he attended Columbia and married SEAS, receiving BS and MS degrees in industrial engineering. He then worked for Grumman for 43 years as the support material manager and later assistant director of systems engineering. In 1993, he received the Citizen of the Year award from the Nassau County Chapter of the NYS Society of Professional Engineers. He was active in the Boy Scouts for Nassau and Suffolk County, was the ward of Trinity Church in Roslyn where he received the Bishops Cross, delivered Meals on Wheels for St. Francis Hospital, and was a volunteer for the Salvation Army bells with his beloved dog in reminder cars. He was a charter member of the Garden City Kiwanis Club, and life member in North Shore Kiwanis and Kiwanis International. He received many awards, including the prestigious Hixon Award and Tablet of Honor. He is survived by his wife of 66 years, Betty, three children and four grandchildren.

B. Weston Monooco 50CC of Watertorn, Conn., died Oct. 21, 2008, in Vancouver, B.C., while traveling on business. A native of New York City, Monooco was reared in Yonker, N.Y., and Danbury, Conn. He received a BA from Columbia College and a BS in electrical engineering from SEAS. He spent his business life in manufacturing and sales, developing state-of-the-art products ranging from sleeping bags to holistic dog food. He was particularly proud of playing the role of Drosselmyer in Main Street Ball’s production of Nutcracker,” a role he played for 17 years, only retiring due to ill health. He is survived by his wife Dorothy, four children, four grandchildren, and a great-grandchild.

1952

Walter F. Abath (MS) of New Castle, Del., died suddenly on Sept. 18, 2008 while at the Academy of Life-long Learning, where he enjoyed the cultivation of mind and spirit for over 15 years. Born and raised in New York City, he held masters degrees in engineering from both Columbia and Carnegie-Mellon. He retired in 1992, after 41 years with DuPont. An avid philatelist, Abath also enjoyed traveling extensively with his wife Madeline. He is survived by his wife, two daughters, a son, 10 grandchildren and one great-grandchild.

1954

Edward S. Palasthy (MS) of Martinsville, Va., died on Sept. 14, 2008 after a long illness. A native of Bethlehem, Pa., he graduated from Maury High School in Norfolk in 1939. After working as an apprentice machinist in the Naval Shipyards, he served as a second engineer in the U.S. Merchant Marines in the North Atlantic and Mediterranean, making 29 ocean crossings during and after World War II. He received a BS degree from Virginia Tech and MS in mechanical engineering from Columbia. He worked as a research engineer for Rohm and Haas in Huntsville, Ala., and was an assistant to Werner von Braun, the German rocket designer and propulsion specialist. He and von Braun helped start the first Lutheran Church in Huntsville. He took a job with DuPont, where he worked as a research and development engineer for 30 years. He continued to consult for DuPont for an additional 10 years. While working for DuPont, he lived with his family in Wilmington, Del., and Camden, S.C., before settling in Martinsville in 1962.

After his retirement, he taught physics at Carlisle School and attended Park Henry Community College, graduating in 1995 at the age of 72 with an associate degree in computer science, becoming, at that time, the institution’s oldest graduate.

1955

Andrew M. Werth MS ’59 of Washington, D.C., a satellite technology developer and entrepreneur who was considered a key figure in the industry for decades, died Jan. 28, 2009. Werth was former president of Hughes Network Systems International, where he helped build and sell satellite systems to 17 countries for a variety of uses, including telecommunications and weather forecasting. He spent his childhood in Germany, France and Cuba, and his fluency in multiple languages was crucial to his work in international business. He helped Hughes win a major contract in 1998 with the Comprehensive Test Ban Treaty Organization. As one of the earliest employees of Washington-based Comsat, he was responsible for the tracking, telemetry and command systems of the world’s first commercial satellite in 1965. He held a number of patents in the field of satellite technology and marketed Hughes technology that became the backbone of the private satellite network.

He was a nationally ranked racer in his youth and in his senior years, when he resumed serious bicycling and raised his mileage to 10,000 miles a year. He won the USA Cycling MastersTrack National Championship in 2000, 2003 and 2005. Born in Saarbruecken, Germany, of a German father and a French mother, he and his family fled the Nazis and settled near Paris but left as the Germans advanced to the French capital. After a brief period in Casablanca, Morocco, the family went to Cuba, where the 8-year-old Werth learned Spanish. Two years later, they immigrated to the United States.
As a teenager in New York, he became obsessed with bicycling, taking off for Canada for nine days. Upon his return, he revealed his winnings—a stack of $100 bills, which paid for a semester at Columbia, where he graduated and later earned a master's degree in electrical engineering. He met his future wife at a bike race and competed in the 1952 Olympic trials.

His career began at ITT in New Jersey, where he was assigned to research digital satellite communications as the Russians launched Sputnik. By 1964, he left ITT for Comsat, becoming its 35th employee. He worked with Hughes and later became responsible for launch operations from the ATT Telstar Earth Station at Andover, Mass. After that first commercial satellite was in operation, he worked on Intelsat II, a satellite for NASA’s manned space projects, and Intelsat III. He transferred to Comsat Laboratories in 1967 and developed a series of high-performance satellite modem systems. In 1972 to co-found Digital Communications, a Montgomery County-based firm that built sophisticated digital communications systems. In a series of acquisitions, the company became part of Hughes Network Systems in 1987. He is survived by his wife of 55 years, Eileen, and three children.

1972

Jay Adam (MS), partner in the engineering firm Jay Adam of Upper Montclair, N.J., died Jan. 24, 2009, on the ski slopes of Mount Snow, Vt. An avid skier and photographer, he was a partner in SESI Consulting Engineers, Pine Brook. He was born and raised in Manhattan, graduating from City University of New York, receiving a master's degree in civil engineering from Columbia before moving to Montclair 35 years ago. He is survived by his wife, Pegi (Margaret), and two sons.

1973

Jacques Tabanou (MS) of Houston, Tex., died Sept. 17, 2008. A native of Tours, France, he was educated at Lycee Saint Charles, and studied at the Ecole Superieur d’Electrique, where he graduated with a degree in electrical engineering. After one year of military service, he began his career at Schlumberger in 1965.

In 1969, Schlumberger transferred him to the United States to work in their research center in Connecticut. During that time, his two sons were born and he acquired a master's degree in electrical engineering at Columbia. He was an expert in resistivity measurements tools and his expertise was widely sought within the company. During his 42-year career with Schlumberger, he worked as an engineer, department manager, and technical advisor, producing 28 industry patents.

Tabanou’s love of music began in college in France where he played guitar. For the last 25 years, he contributed his resounding baritone voice to the Houston chapter of United Nations International Choir. He was an avid hiker and enjoyed painting, was a past president of the Houston chapter of the Alliance Francaise, and served on the board of directors of the Awty International School. He was a member and past president of the Association of French Living Abroad. And was a member of the Society of Professional Well Log Analysts, which awarded him a lifetime achievement award. He is survived by his wife of 43 years, Bernadette Gabrielle Tabanou, two sons and three grandchildren.

1974

Carl L. Smothers (MS) of Roanoke, Va., died Feb. 20. A native of Lexington, Va., he began his early years of church and community service at the Randolph Street Methodist Church where he attended Sunday school and joined the Boy Scouts earning numerous badges for his participation and service. His education and training started in Lexington, at Lyburn Downing Elementary School. He graduated from Lexington High School and matriculated at Washington and Lee University, where he was the first African-American graduate receiving a BS degree in engineering. He relocated to New York City, where he received his master’s degree in systems engineering from Columbia SEAS. Upon graduation, he began his career with IBM in Manhattan. In 1996, he joined Lockheed Martin. In later years, his health declined and he retired from Lockheed Martin in 2007. He is survived by his wife Cheryl, four children, three grandchildren, and his father, two brothers and two sisters.

1986

James E. Ehrlich, 44, Bedford, N.H., died Dec. 7, 2008, from a short but courageous battle with melanoma cancer. Jim was born in Poughkeepsie, N.Y., and raised in Natick, where he was a graduate of Natick High School, excelling both academically and athletically. He graduated from SEAS with a degree in industrial engineering, and was captain of the varsity swim team. He was employed by Control Data, Comsat, and Allied Analytical for over a decade, and later moved to Houston, Tex., to join American General Life from 1998-2002. From 2002 to 2004, Ehrlich ran his own voluntary insurance company from Bedford, N.H. His most recent position was client executive for Marsh & McLennan.

His strong work ethic and enduring optimism made him the ideal colleague, problem solver, and mentor. He was a man of honesty and integrity, and respected by all of his associates. Most known for his animated and witty sense of humor, he drew laughter with his one-liners, polished joke telling, and enduring smile. He enjoyed tennis, golf, basketball, and working out, but his real passion was swimming. In 1981 and 1982, he received the Boston Globe All-Scholastic Boys Swim Team award in 100-meter backstroke, and set numerous swim records at Natick High School and with the Barracuda team. The two most important things to Jim were his faith and his family. He is survived by his beloved wife, Christine, daughters, Dana, and Lauren, 9, five siblings, and 11 nieces and nephews.

Honoring Jim’s battle with melanoma, the family is hosting the Jim Ehrlich Memorial Charity Golf Event on Aug. 24, 2009, at Atkinson Resort and Country Club in Atkinson, N.H. Registration may be requested by e-mailing jleclea@td.net. Donations may be made to the Jim Ehrlich Memorial Family Foundation at 618 Woodlands Bluff Lane, Mineral Bluff, Ga. 30569.

1989

Tyler Eldred (MS) of Castwood, Ky., was born in Milwaukee, Wis., and died in an accident in Louisville, Ky., on Feb. 14, 2009. He grew up in Salem, Ore. and graduated with highest honors from McKay High School. He entered the Air Force Academy, where he received the Scholar Athlete Award and earned a place in the Athletic Hall of Fame. He received his master’s degree from SEAS, where he was a Guggenheim Fellow. He was twice named Oregon Rhodes Scholar. He returned to the Air Force Academy where he taught aeronautical engineering and trained future pilots in T-37s. He owned Daedalus Development Corp. and was founder of LifeChampion International. He is survived by his wife, Stacy, daughters Heather and Alexandra Dryanskaya, son, Tristan Eldred, daughter Avery Dawn Eldred, and his father, mother, brother, and sister.

2012

Eric J. Harms, Farmington, Minn., 19, passed away suddenly on January 31, 2009, at Columbia, where he was an academically talented engineering student and a beloved member of the student council, jazz and theater programs. Eric was vivacious, funny and an accomplished pianist. He graduated from St. Thomas Academy in 2008 where he was active in many academic clubs, theater, band and served as the drum major and jazz combo leader. He is survived by his parents, Jim and Kim Harms, sisters Hilary and Ashley, many aunts and uncles and more than 80 cousins.

OTHER RECENT DEATHS

Philip E. Fisher Sr., 34, \[33\] CCC Evad H. Gastror, \[34\] CCC Robert M. Hecker \[36\], \[36\] CCC Jerome S. Schaul \[37\], \[35\] CCC Herbert J. Carlin \[39\], \[30\], \[38\] CCC Robert R. Banks \[44\], \[46\], \[50\], \[50\] SOM GASA.

Kurt F Minati '44

John C. Donahue '45, \[44\] CCC, \[48\] BU Robert Dresler '46, '48

Victor Scotton '46

Ray L. Lyerly '48

Henry P. McAleer '48

Vincent A. Nolli '48

Boris Yarger '48, \[64\] BU '64GYSAS

Edwin M. J. Lavo '49, '46CC

Robert J. Maroni '49

Ernest F. Martin '50

Dino Rossini '50, '49CC

Robert A. Wessels '50

Gilbert E. Henniger '51

Richard H. Hunter '51

Samuel Y. Shin '51, '51GYSAS

Eugene Baldoni Jr. '52

John P. Johnson '52

Hyman Jerome Weber '52

Jerry M. Bennett '53

Anthony J. Denning '53

Joel N. Bloom '54

Lawrence J. Contello '54, '53CC

RALPH B. JOHNSON '54, '54CC

Mark R. Kulina '54

Franklin R. Helt Jr. '54

Alfred Kahler '56, '55CC

Norboni Kondo '56, '64

Takeshi Nagano '56

George J. Seta '57, '56CC

Joel M. Stempler '57

Dimitri S. Bugnolo '60

George R. Surgeant Jr. '62

Samuel C. Goldman '63

Harry F. Jacks '64

Herbert L. Poserow '64, '67, '63CC

Clifford J. Ansell '68, '71

Joseph Baumber '68

Leonard A. Valadez '73

Harold R. Alexander '76

Djordje V. Franovic '76, '81, '82

Jonathan Oren Nadel '78

Kevin Fu-Chueung Wan '83

James Clement Kearney '84

Bryan John Lewis '94

Family members may e-mail information for this section to: mk321@columbia.edu
Reunion 2009—June 4-7
Dean’s Days—June 5-6

S
EAS alumni from all graduating classes are invited back to campus on Friday and Saturday, June 5 and 6, for two special days of celebration. Each day has full programming for all alumni with special programming for SEAS Reunion classes, the Classes of 1959, 1964, 1969, 1974, 1979, 1984, 1989, 1994, 1999, and 2004. Reunions also will have opportunities to reconnect with College and Barnard friends at events scheduled throughout Reunion Weekend, which runs from June 4-7.

Dean’s Days for all SEAS alumni begin on Friday, June 5, with breakfast, a choice of academic classes, departmental luncheons and tours of the campus. Clark T. Hung, associate professor of biomedical engineering, will present one of the mini-courses at 11 a.m., Engineering New Knees—Are We Getting Close? A highlight this year will be department-sponsored luncheons, where SEAS alumni from all classes will have a chance to socialize with their fellow majors and to learn more about changes in their department. Professor Raimondo Betti of the Department of Civil Engineering and Engineering Mechanics will present a mini-course at 2 p.m. on Bridge Cables—Will They Hold Up? (see story on page 7). The interactive session in Carleton Laboratory will give participants a look at how bridge cables age.

Space is limited. Reunion classes will continue celebrating with special evening events, which differ for each class and include cocktails, dinners, and lots of conversation.

Saturday morning brings a trio of lectures presented by distinguished University faculty: R. Glenn Hubbard, dean of the Columbia Business School; Mehmet Oz, professor of cardiac surgery, and James A. Schamus, professor of professional practice in School of the Arts. Business, Knowledge and Economic Growth is the topic for Dean R. Glenn Hubbard, who is also Russell L. Carson Professor of Finance and Economics at the Business School. Oprah Winfrey’s frequent guest, Dr. Oz, will speak about An Owner’s Manual for YOU, which is the title of his new book. James Schamus’s topic is My Wife is a Terrorist: Narration, Rhetoric and Hemerene - ας of Suspicion. All these lectures will begin at 10:30 a.m.

At the same time, the Class of 1959 Medical Panel will discuss Repairing the Healthcare System. The Medical Panel is composed of prominent physicians from the Class of 1959 and will be led by Dr. Stanley Feld, FACP, MACE.

Following these lectures, SEAS will host a luncheon under the tent on Pupin Plaza, where an induction ceremony for the newest Golden Lions will be held. Golden Lions, SEAS alumni who have celebrated the 50th anniversary of their graduation from Columbia, are special guests of the School as they gather to welcome the members of the Class of 1959 into their ranks. Members of the Class of 1969 will join with their Columbia College classmates for a special luncheon and panel discussion.

All SEAS alumni will gather in Davis Auditorium at 2:00 p.m. for the McGill Lecture in Science, Technology and the Arts, which explores the synergy between art and science and a celebration of the pioneers who bridge the gap between artistic and scientific endeavors.

Robert M. Bakish ’85, ’89BUS, President of MTV Networks International, brings to bear his experience overseeing all MTV Networks operations outside the U.S., including the MTV: Music Television, VH1, Nickelodeon, TMF (The Music Factory), VIVA, Paramount Comedy and Game One brands. He will speak about Creativity, Commerce and Countries—A GLOBAL Model, globally using local resources and cutting-edge technology. Following the Magill Lecture, Golden Lions will have their own “den” in which to relax while all alumni are invited to enjoy light refreshments and good company.

For Reunion classes, Wine Tasting begins at 5:15 p.m., followed by class cocktail receptions, class dinners, and the Starlight Reception, dancing under the stars on Low Plaza, that round out the day’s activities. The weekend comes to an end on Sunday morning with an all-class Reunion Brunch with The New York Times, lox, and bagels in Low Rotunda.

For Reunion Years Ending in ’4 and ’9 and 2008
To celebrate your Reunion or one-year anniversary, join with the Class of 2009 for the Parade of Classes at Class Day on Monday, May 18. Class Day ceremonies begin at 9:30 a.m. and are preceded by a breakfast for SEAS alumni in John Jay Hall Lounge from 8 - 9 a.m. To join in the celebration, RSVP to Scott Kelly at 212-854-4472 or by e-mail at stk2110@columbia.edu.