FROM THE DEAN:
David S. Dolling

I became dean of the School of Engineering and Applied Science on September 1, 2008, with the school’s 125th anniversary fast approaching. Not wanting to let this moment in the school’s history pass us by, I decided to work with faculty and staff—who already knew some of the history of SEAS and were already a part of it—to commemorate it in various ways.

Synergy is one of the ways we decided to do this. Our cover story relates that when SEAS was inaugurated on October 1, 1884, one of our early supporters declared to our students that science (which was then understood to incorporate engineering) was the “companion of industry.” For 125 years, SEAS has prepared engineers—and more recently computer scientists—to be “companion[s] of industry.” We have also been the seedbed for generations of men and women who have provided technological leadership for the U.S. Government. And we have been the home of top-notch teachers and researchers, too.

It is with justified pride, then, that we reserve our cover story for a look backward, at our history and our contributions. That said, however, our focus is on the future. Throughout this issue, we highlight the contributions that our faculty and students make to the body of technological progress—in transportation safety, nanotechnology, civil infrastructure, data privacy, information security, and plasma applications, just to name a few areas.

Finally, we decided to have a little fun and invite our faculty and students to look forward 125 years and tell us what changes they think engineers and computer scientists will have brought to the world of 2134. Five daring prognosticators stepped forward and offered their visions of the future, which you can find on page 7.

Let me end by inviting you to participate in one, several, or all of the events that we have planned throughout the rest of 2009 to celebrate our 125th anniversary. There is something for almost everyone, since the activities run the gamut from a softball game and cookout, to lectures and seminars, to a 125th gala and events for our students, their parents, and our alumni and research partners. If you would like to receive special reminders of the events, please visit http://www.seas.gwu.edu/SEAS125/ to sign up for our e-mail notices, and we will make sure to update you as the events draw near.

I hope you will consider joining us.

Sincerely,

David S. Dolling, Ph.D.
Dean
COVER STORY:
BRINGING ENGINEERING TO WASHINGTON
William Corcoran and His Transformative Vision

PERSPECTIVE:
TRANSFORMATION: ENGINEERS DO THAT
A Perspective from SEAS Dean David S. Dolling

GW ENGINEERING DEPARTMENTS
PREDICTIONS

STUDENT PROFILE: Muriel Dumit

ALUMNUS PROFILE: Bill Westenkofer

NEWS

FACULTY

STUDENT NEWS

DONORS

ALUMNI

CLASS NOTES
"Working Out" the Solutions

Professor Pedro Silva of the Department of Civil and Environmental Engineering has always been physically active—swimming, running, or bicycling. He bikes 18 miles to and from work each day, and he says his bike riding commute is essential because it is during this time that he solves complicated equations, debugs computer code, develops innovative ideas for proposals, and handles other intellectual tasks—all in his head.

Silva uses this time on his bike to think creatively and dream. He believes that creativity is key to his work. Responding to a question about his research challenges and limitations, Silva says, "The limitations are only within myself. I will be the limiting factor of the research. But what's different about my approach is how I look at it from a holistic point of view. I'm not just interested in that small component of research but in how it affects almost everything else outside."

His research focuses on designing better impact-resistant or load-bearing structures, but, as he says, he always looks at the bigger picture and tries to design materials that do more than simply perform a structural function. He seeks to design structures that use less material, save energy, are more aesthetic, or reduce harm to the environment. In short, he sees his structures in the greater context of helping give people better, safer ways to live.

Take, for example, his current project to help design reinforced panels for homes. Silva explains, "The materials in my current proposal have two skins that are sandwiched in a foam, and the density of the foam can be designed for you to be able to achieve the structural performance. The foam and skins meet their structural requirements, but you can also insert collecting systems into them that draw the heat—for example, metal tubes that collect water that then gets heated. So the materials can be used both as a structural component of the home and to collect energy for the home. The application of these is infinite. It might not be for the construction of homes but for the construction of highways, so the reinforcement of the asphalt also can serve a dual purpose of collecting energy. Currently, we're wasting a massive amount of energy from heat that escapes from asphalt in the summer, but if we can envision a highway system built with these types of materials, if we can draw massive amounts of energy out of asphalt, we're talking about a revolution."

While Silva is a visionary person, it is clear that his aims are very practical. In addition to his reinforced panel design project, he currently has grants from the National Science Foundation to study the optimum design of bridges and to participate in a multi-university earthquake engineering simulation. And some of his research has been put into American Concrete Institute codes of practice (the standard for concrete construction in the U.S.), taking it all the way from vision to reality.
Minimizing Trade-Offs

Life is full of trade-offs: we give something up to get something else. In the world of wireless devices and networks, sometimes the trade-off is giving up a bit of privacy in exchange for the convenience of using your cell phone, PDA, or other wireless device. That trade-off is what Professor Nan Zhang of the Department of Computer Science is working to minimize.

Zhang currently works on three projects that fit under the common theme of information security and privacy. Two of the projects—location privacy for wireless networks and privacy-preserving data mining—research and identify the threats to an individual person’s privacy and aim to develop methods to protect them and counteract the threats.

The first step to combating the threats to privacy is to identify them. That is what Zhang and his colleagues, Professor Xinwen Fu of the University of Massachusetts-Lowell and Professor Wei Zhao of the University of Macau, have been doing. They were the first to discover that an adversary can set up a large antenna on the top of a building and very accurately estimate the location of all wireless devices operating in the area. “Most people,” says Zhang, “don’t know that whenever they have their cell phones with Wi-Fi open, this allows someone to know exactly where they are, even if they are not talking.” Zhang and his colleagues also have discovered a system that allows people to use location-based services like Google maps to find points-of-interest, yet automatically hide their location from Google and still get very accurate location-based information. In fact, Zhang’s doctoral student, Aniket Pingley, is currently working to publish the system on the Web and make it available to the public.

Likewise, Zhang and doctoral student Xin Jin are exploring ways to protect the privacy of individual information during data mining, a process that extracts information from databases for use in marketing, weather forecasting, medical diagnosis, and national security. Practical privacy-preserving data mining systems are largely in the research and prototyping stages, and Zhang is trying to explore possible solutions that would lead to guidelines for building these systems. Zhang explains, “We want to allow everyone to be able to get knowledge from the data, but we don’t want individual people’s information—like their age, occupation, salary—to be disclosed.”

Zhang’s third project considers privacy from the perspective of a company, government organization, or other large information provider. These organizations need to publish large amounts of information, either to provide services to their customers or for the benefit of society, but they need to keep the data from being exploited by competitors, adversaries, or terrorists. Zhang and his colleague, Professor Gautam Das of the University of Texas at Arlington, defined the problem of privacy protection in hidden Web databases. Says Zhang, “We basically discovered for the first time that the hidden database is also subject to significant privacy concerns, and we provided the first solution to help protect privacy in hidden databases.”
Putting the Guesswork In

Internet traffic is exploding, and as multi-media applications like YouTube and video-on-demand expand—and more content is transferred over the Internet rather than over specialized networks such as telephone and cable—it will continue to multiply. Fiber and optical networking equipment make up the bulk of the infrastructure that carries this traffic, and, in fact, fiber is the only medium that currently is capable of satisfying this huge demand.

So anticipating what direction fiber optic networking will go in the next five to ten years is an important venture, and it is the challenge that Professor Suresh Subramaniam of the Department of Electrical and Computer Engineering has set for himself. “A two-word description of what I am is a ‘network architect,’” explains Subramaniam. “I come up with new ways to design fiber optic networks, looking at their performance through mathematical tools. I design new algorithms to find better ways to send data from one point to another or to combine data from various sources to be sent over one fiber.”

Although Subramaniam’s research interest is in general networking, his primary focus is on modeling optical network performance. Modeling necessarily requires assumptions about the future, and this is the biggest challenge he faces. “Without assumptions you can’t do modeling,” Subramaniam says, “but you have to make the right assumptions; that’s the catch. You can’t depart too far from reality.” The other challenge is to architect networks that are cost-effective, because cost is the main consideration. This includes estimating what kind of traffic the network will carry and what the intensity of that traffic will be.

Although fiber is a revolutionary transmission medium capable of handling an enormous traffic load, it must be present at all the various points that traffic is generated and at the end user locations. As Subramaniam notes, “It’s easy to put a lot of fiber in the middle of the network where a lot of traffic is being mixed together; the challenge is getting the fiber all the way to these end points and to the customer locations in a cost-effective manner. Because the expenses in building such large fiber optic networks are huge, modeling them first is critical.”

Subramaniam has already made some unique contributions to optical network improvements. A common problem with optical networks is that signals get distorted as they move through the network. Historically, regenerator nodes have been set up throughout the network to correct the distortions, but they are quite expensive. Working with Professor Maite Brandt-Pearce of the University of Virginia, Subramaniam looked for alternative ways to intelligently route signals through the network to minimize the effects of these distortions. “We were able to show that you can get rid of a lot of regenerators by using intelligent algorithms for routing signals and thereby save a lot of cost,” he says. “We were one of the first groups to do this and several other groups are now following up on our work.”
How Do You Know It Works?

“One of the hardest problems in information security engineering is knowing when the security is being effective,” says Professor Julie Ryan of the Department of Engineering Management and Systems Engineering. “Consider the challenge: if nothing bad happens, is it because your security worked? Or could it be that nothing happened because, well, nothing happened? Or perhaps something bad did happen, but it simply wasn’t detected? This challenge has been an active problem in information security research for over 30 years and no good solution has been reached yet.”

This question—How do you know if it works?—is an interesting and important research question for Ryan personally, as well as for any organization that needs to protect its information, because security is expensive. “Think about the amount of money that an organization spends on security stuff, anti-virus software and the like. It adds up to an enormous amount of money that could be spent elsewhere. So, when the decision makers are trying to decide where to allocate this money to get the biggest bang for their buck, they’d like to know that they are actually accomplishing something,” Ryan explains.

Plenty of researchers like Ryan are trying to solve this same problem, but the big challenge before them currently is to instrument an operational system and test the theories. One of the difficulties of doing this is simply to be able to work with the sheer volume of data associated with instrumenting an operational environment.

Another challenge is to come up with a conceptual approach to the problem. Ryan and her colleagues—Professor Thomas Mazzuchi, chairman of her department, and Professor Dan Ryan of the National Defense University—have come up with a unique approach that applies lessons learned from the biomedical statistics field. Ryan argues, “We face almost exactly the same problem that is faced in biomedical research. Consider preventive care research: if a patient doesn’t get sick, is it because the preventive care protocol was effective, or is it because the patient was not exposed to a causal agent? Or is it because of genetic history or chance? So we are applying the same methods to studying the ‘health’ and security effectiveness for information systems.”

Their research has resulted in three published papers already, and the hope is that it will provide engineers the ability to model and architect cost-effective security systems while providing managers with the ability to track return on investment and performance metrics.

Ryan is enjoying trying to solve the puzzle. “I trained as an intelligence officer and was assigned to the Defense Intelligence Agency earlier in my career,” she remarks, “and over time I found myself neck deep in information security stuff. Since security is the other side of the coin from intelligence, it wasn’t too hard a journey—and it has been fascinating.”

THE QUEST: “Don Quixote, like many researchers, imagined how the world could be different,” says Professor Julie Ryan.
**Profile**

Chair: Michael W. Plesniak  
202-994-9803  
[www.mae.seas.gwu.edu](http://www.mae.seas.gwu.edu)  
**Full-time faculty:** 14  
**Undergraduate students:** 116  
**Graduate students:** 71  
**Annual research expenditures:** $1.4 million

**FACULTY**

Pinhas Ben-Tzvi, ASSISTANT PROFESSOR  
David F. Chichka, ASSISTANT PROFESSOR  
Andrew D. Cutler, PROFESSOR  
David S. Dolling, PROFESSOR AND AIAA FELLOW  
Charles A. Garris, PROFESSOR AND ASME FELLOW  
Stephen M. Hsu, PROFESSOR AND ASME FELLOW  
Roger E. Kaufman, PROFESSOR  
Michael Keidar, ASSISTANT PROFESSOR  
James D. Lee, PROFESSOR AND ASME FELLOW  
Youngsheng Leng, ASSISTANT PROFESSOR  
Rajat Mittal, PROFESSOR  
Michael W. Plesniak, PROFESSOR, ASME FELLOW AND APS FELLOW  
Yin-Lin Shen, PROFESSOR  
R. Ryan Vallance, ASSOCIATE PROFESSOR

**Research Areas**

**Aerospace Engineering**

Chichka, Cutler, Dolling, Garris, Plesniak

**Biomedical Engineering**

Chichka, Kaufman, Lee, Mittal, Plesniak

**Design and Manufacturing of Mechanical and Aerospace Systems**

Ben-Tzvi, Garris, Kaufman, Leng, Shen, Vallance

**Fluid Mechanics, Thermal Science, and Energy**

Cutler, Dolling, Garris, Hsu, Mittal, Plesniak

**Solid Mechanics and Materials Science**

Hsu, Lee, Leng

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**Breakthroughs**

Professor Michael Keidar of the Department of Mechanical and Aerospace Engineering directs GW’s Micropropulsion and Nanotechnology Laboratory (MpNL), where he and his team study plasmas and their applications to healthcare, energy, defense, communications, and other sectors. For the uninitiated, Keidar explains, “Any material that can be heated to very high temperatures will transform itself into a plasma state where neutral particles will be transformed into charged particles, and that gives us a great deal of flexibility to manipulate this matter by means of electric and magnetic fields.”

And what do they manipulate this matter to do? The MpNL currently has three main projects that work toward very different applications. One project uses plasmas to create new micro-propulsion devices called micro-vacuum arc thrusters, which provide small forces that can be used to correct or sustain satellites in their orbits. According to Keidar, the primary benefit of this kind of device is that it can operate for very long periods of time without any degradation of performance—the main problem with micro-propulsion these days—and this means that, unlike other similar devices, it could be used to go into a deep space mission.

A second project uses plasmas to grow new carbon nanotubes, which when used with hydrogen in a gaseous phase, could have great applications in hydrogen storage, and this could help create clean energy sources for our automotive industry. Keidar explains, “They can also be used as a bridge or connector between two electrodes that will be able to create a nano-device, and for this you need to be able to control the length of the nanotube. We’re trying to establish what the limit is of the length of nanotubes, and we’ve already had some success in growing relatively long tubes and increasing their growth by a factor of 10. In this project, I’m collaborating with Professor Mona Zaghloul from the Department of Electrical and Computer Engineering.”

The third project has provided the biggest breakthrough thus far. Working in collaboration with Dr. Mary Ann Stepp, a cell biologist with GW’s Department of Anatomy, Keidar and his team have had a great deal of success using plasmas for biomedical applications. With support from GW’s Institute for Biomedical Engineering, they generated a device called a cold atmospheric plasma jet, which they used to look at the interaction between it and skin-type tissue cells. They found that they can kill an individual cell without damaging the neighboring cells, which is helpful in treating skin cancer; they can manipulate a large number of cells and change their properties without damaging them; and they can change cell migration velocity, which could help in slowing down wound healing (to lessen the formation of scar tissue in younger patients) or possibly speed it up in older patients.
Looking Ahead 125 Years: 
What Will 2134 Be Like?

Murrad Kazalbash:
Our grasp on technology will be so incredible that even people in the most rural villages will be able to communicate with businessmen in the most advanced metropolitan cities. The needs of the people will be for water, food, shelter, and computing technologies. Biomedical imaging and diagnostic abilities will be very inexpensive and readily available. Structures will be built from sturdy, affordable, ergonomic materials. Engineers will not shy away from the public eye, as may have once been the case, because children will name engineering as one of their prospective career choices, where once respect and adoration were concentrated on being a doctor, lawyer, astronaut, firefighter, or president.

Uchenna Obaji:
Socially, I see a world heavily based on robotics and other forms of artificial intelligence. Robots will take over many everyday tasks, and they will even take over many of the blue collar occupations that are currently being done by humans. Medically, I see cloning being an important factor in our society. I see people having the ability to choose the genetic make-up of their children and choosing what traits their children will have.

Natalie Rabinovich:
I believe that over the course of the next 125 years, we will make an enormous amount of progress in genetic research and bio-informatics. Not only will we make breakthroughs in cancer research, but the potential of DNA manipulation will also be commercialized. People will be able to custom design babies and reconstruct our own genetic make-up to fit our likes and dislikes. People will have the ability to change their eye color, hair color, or hair structure (e.g. straight, curly, wavy) without using colored contacts, hair dye, or tools.

Professor Rahul Simha:
The event is attended by swarms of personal robots, standing in for the owners who couldn’t return from the school’s lunar campus in time for the event. Event details are transmitted directly to cranial attachments that record the event for posterity—the first generation of lightweight iNeuro cranial attachments are now required of all students. The gathering takes place on the Mall in the school-designed, self-assembling flexSteel dome that is folded away by robots at the end of the event.

The day ends with an informal student-faculty gathering to talk about current issues: students in 2134 continue to gripe about their calculus courses.

Professor Shelly Heller:
By 2134, we will have either “done ourselves in” or managed to correct our excesses. I prefer to hope we will have prevailed through our engineering and computing efforts to harness renewable energy. Computing will no longer stand as an option alone but will be as central to everyone’s life as water and air, both of which will be clean.
Bringing Engineering to Washington
William Corcoran and His Transformative Vision

SEAS Turns 125 YEARS OLD

To many, the Washington of the 1880s was not a promising place to start a school of engineering and applied science. “It was rural, and its society was primitive,” complained the writer Henry Adams. “No literary or scientific man, no artist, no gentleman without office or employment, had ever lived there.” Adams may have been exaggerating the state of Washington society but he was likely aware that the leading advocate for scientific education in the District was not a scientist or an engineer but a retired banker named William Corcoran.

Corcoran had been born in Washington. His father had been a merchant in Georgetown. He had followed his father’s career only to see his business collapse during a time of economic difficulties. After a few fallow years, Corcoran had switched to banking. He had made his fortune in a short period by financing the Mexican American War and then had retired from commercial life. “As compared with the millionaires of New York or Chicago, he was not a rich man,” wrote on admirer, but “his philanthropic acts attracted far more attention than his wealth.” He had founded an art gallery that bore his name, created a home for poor widows, and donated a medical building to the George Washington University (then known as Columbian University).

Because of his position in society, Corcoran knew every District resident who had any interest in science or technology. Most of these individuals were connected with the Naval Observatory or the Smithsonian Institution. In 1878, he had lent these individuals a room in his office building to form a club for scientists. They had named their organization the Cosmos Club because of the number of astronomers among their members, and soon found a permanent home on Lafayette Square in the center of the city.

One of the neighbors of the Cosmos Club was the Columbian University. In 1882, the university occupied a new building at 15th and H Streets, barely a block away from the Cosmos Club, and it shared not only a common neighborhood but also the common patron of William Corcoran. Corcoran was serving as the chair of the university trustees and had helped the school finance its new campus.

Looking to the educational needs of both Columbian University and the District of Columbia, Corcoran decided that the university needed to start a scientific school, a college that would teach both science and engineering. Such schools were common in that time. The Lawrence Scientific School at Harvard had been operating since 1847. It had been followed by similar schools at Yale, Columbia, and the University of Pennsylvania. None had been founded in the south. Indeed, Johns Hopkins in Baltimore was the only school south of Philadelphia that offered a scientific education.

Without consulting anyone at the university, Corcoran announced his decision to a surprised board of trustees. “It is to be a polytechnic school, somewhat on the model of the Boston Institute of Technology,” announced the Washington Post. The university had few teachers who could help with such a school, so Corcoran turned to a pair of his friends at the Cosmos Club for assistance, Simon Newcomb and...
Cleveland Abbe. Newcomb, who had been educated in mathematics at Harvard, was the director of the Nautical Almanac Office. Abbe, who had studied in Europe as well as the United States, was the chief of the U.S. Weather Bureau. Both their names were prominently displayed on the list of faculty for the new school and both taught classes.

The Corcoran Scientific School opened its doors on October 1, 1884. It was a night school. That night, the students and faculty were addressed by the geologist John Wesley Powell, yet another member of the Cosmos Club. “Science does not wait on genius,” he argued, “but is the companion of industry.” The school would strive to be the companion of local industry or at least the local offices that clustered about Lafayette Square. Classes were held after work, beginning at 6:00 pm. Faculty and students would arrive at 4:00 for discussions and lab work. When the evening’s instruction ended, the teachers would retire to the Cosmos Club for dinner.

Initially, the school offered only two engineering degrees, that of civil engineering and a more specialized bachelor of science in mining engineering. At the time, the term “civil engineering” was still used to refer to any aspect of engineering that was distinct from military engineering. However, just as the school opened its doors, two other fields of engineering were starting to assert independent identities. Mechanical engineers had formed a professional society only four years before, and electrical engineers were establishing a society in New York as the Corcoran School began offering classes. Faculty acknowledged the importance of these new disciplines in the school’s initial catalog and developed courses for them. Students “completing any of these courses,” the catalog announced, “will receive the corresponding degree.”

From its inception, the Corcoran School offered graduate degrees, though the initial demand for such instruction was slight. “If a sufficient number of students shall apply for instruction in advanced studies,” the school advertised, “arrangements will be made for them, as well as for graduate practice and original research in the laboratories.”

**FIRST HOME:** In its early years, the engineering school was housed in this building on 15th and H Streets.

(Top left) The Cosmos Club: Through William Corcoran, the early engineering school had many ties to the Cosmos Club, located only a block away.

Charles E. Munroe (above) was dean of the Corcoran Scientific School from 1892-1897 and an important researcher in the school’s early days.
Much of the school's early research was connected to the military. In 1894, Professor Charles Munroe, who served as the school's second dean, developed a new explosive for the ordnance laboratory at the Navy Yard. “This powerful substance is composed of a dark liquid and a white powder that while the two are kept separate,” the Washington Post announced, “the liquid is as harmless as water and the solid as harmless as so much sand.”

Munroe was perhaps the most prominent researcher in the early days of the school but he worked in an environment that was radically different from modern circumstances. He had no grants from the federal government or contracts to support his laboratory. Instead, he had to request equipment and supplies from alumni and friends of the university. “The school has been indebted to generous friends for many and valuable gifts received,” wrote an early dean. These gifts included equipment such as motors, a mill for the amalgamation of free metal in gold bearing ore, a milk testing machine, two dynamos, and a large collection of chemicals for use in the laboratories.

Even the early curriculum bore little resemblance to the modern engineering program of study. Like many of the early engineering schools, the Corcoran School taught courses in a wide variety of subjects. Students in the school could even get a degree in moral philosophy, a field that gave birth to the modern social sciences. Corcoran had also insisted that the school offer courses in German or French so that the students could read the latest technical articles from Europe.

In 1903, the university began to distinguish the different kinds of programs of the Corcoran School. It transferred the scientific programs and other activities to the liberal arts college. Two years later, it established a new school for the engineering programs, which it christened the Washington College of Engineering. In these programs, we can see the outlines of the modern programs in civil, mechanical, and electrical engineering. In developing the college, the new dean, Howard Hodgkins, moved to reaffirm the school’s connection to the federal government. In 1905, he was able to get the school approved as an official technical school for officers.

By the start of the First World War in 1914, the Washington School of Engineering had moved from its building at 15th and H Streets to a new campus at Foggy Bottom. That move symbolized a major change, as it advanced the school beyond William Corcoran’s 19th century vision of a scientific school and created the seed for a modern engineering college.

The war strengthened the ties between the military and engineering schools. As the conflict expanded to threaten the United States, the Cosmos Club again became the center for scientific activities. A group of scientists, most from New York, Boston, or Chicago, formed the National Research Council

“The leading advocate for scientific education in the District was not a scientist or an engineer BUT A RETIRED BANKER NAMED WILLIAM CORCORAN.”
During American involvement in the war, the Washington School of Engineering took the name George Washington University School of Engineering and devoted itself to providing technical education to new officers. The school advertised that its courses were “valuable for students entering several branches of naval service.” Most of these students came from the new Naval Headquarters buildings, which had been hastily constructed on the Mall, just south of Foggy Bottom.

The excitement of the war ended quickly for the School of Engineering. On November 12, 1918, hours after the warring powers had signed an armistice, the United States Government started issuing orders to terminate war production and research. In the years that followed, both the Army and Navy shrank. Nonetheless, the school was able to exploit its location and continue a working relationship with the Navy. Working with engineers at the Naval Yard, its faculty started a program in naval architecture. The school was also aided by the fact that its dean, Howard Hodgkins, had been promoted to university president in 1921. With his assistance, the school was able to build new laboratories for both electrical and mechanical engineers.

The Second World War gave the engineering school new opportunities to expand its educational and research programs. Following the start of hostilities, the school again took a leading role in educating young military officers. Many a young officer told the story of trudging up Virginia Avenue from the Naval buildings to take evening classes at the school.

The school’s research program was greatly aided by the Office of Scientific Research and Development, the organization that was created to provide the military with research support. Located only a few blocks from the headquarters of the organization, the engineering school was in a good position to learn of projects and to promote its faculty. In 1943, the school won the contract to manage rocket and ordnance research at the Cumberland Arsenal in Maryland. In this work, university faculty developed the recoilless anti-tank rifle (popularly known as the bazooka), a variety of short range mortars, and a number of elements of small rockets. In this work, it cooperated with the California Institute of Technology, which later became the Jet Propulsion Laboratory.

By the end of the war, the engineering school was the eighth largest university contractor with the Office of Scientific Research and Development, following only MIT, Cal Tech, Harvard, Columbia, University of California Berkeley, Johns Hopkins, and the University of Chicago.

After the end of the war, the engineering school finally acquired a building of its own. In 1947, Charles Hook Tompkins, an alumnus of the school, offered the city of Washington a building for the school. The building was completed in 1956 and is known as Tompkins Hall. It housed modern civil, mechanical, and electrical engineering laboratories.

**TOMPKINS HALL:** Completed in 1956, the new engineering building boasted modern civil, mechanical, and electrical engineering laboratories.
$22,500 to build a new facility. Tompkins had built a number of buildings for the university, including the hospital and Lisner Auditorium. Construction began in 1954 and finished two years later. The faculty was very pleased with the new building. They were particularly pleased with the new laboratory space. The basement held mechanical and civil laboratories with high ceilings and a protected walkway for observation. The electrical engineering faculty had modern laboratories on the third floor.

In the years that followed the completion of Tompkins Hall, the school evolved into its modern form. Aided by the renewed interest in science and technology that followed the launch of the Russian satellite Sputnik in 1957, it shed outmoded programs and strengthened new ones. The school’s original program in mining engineering was long gone. Naval architecture had vanished a few years after the Second World War. As the school moved into this new era, it added courses in computer science and aeronautical engineering. In 1962, it acquired its current name, the School of Engineering and Applied Science.

Forty-seven years have passed since the school took its current name. This era has stories of its own to tell about its character and contributions to the 125-year-old school founded by William Corcoran. But these are stories for another time, because this story is about legacy and lineage, about the passage from the Corcoran Scientific School to the School of Engineering and Applied Science.

Corcoran’s contributions to the university were many: the Corcoran School established engineering at GW, but it also initiated the Departments of Biology, Chemistry, and Physics. Still, the School of Engineering and Applied Science is the most direct legacy of his vision. He was interested in practical science—in engineering skills that would improve the lives of those people who lived in Washington, D.C. He wanted a school that would bring the benefits of technology ideas to them. A school that would serve the government with research. A school that was within walking distance of the city’s center and of Lafayette Square.

David Alan Grier writes “The Known World” column for the IEEE magazine Computer and is the author of two books on science and technology: When Computers Were Human and Too Soon To Tell. He served as assistant dean of SEAS from 2002-2004 and is currently associate dean of the Elliott School of International Affairs.

SEAS thanks Ross Griffith, a graduating senior in the Department of History, who spent hours researching various local and national archives throughout the Washington, D.C. metropolitan area to find and retrieve information on our history. We also thank Michael Veedock, SEAS administration staff, for his many hours of research assistance.
Transformation: Engineers Do That
A Perspective from SEAS DEAN DAVID S. DOLLING

It has been a long journey from being an English schoolboy in the large but sleepy coastal town of Bournemouth in the south west of England to becoming an American citizen and now dean of SEAS. Back then, in the 1950s and early 1960s, Bournemouth was a seaside town and retirement community, the Florida of England. In an era when travel for the common man was by car or rail, it was a town full of small family-run hotels and in summer packed with young and old enjoying the beaches under a watery English sun. In a few short years, the profession I was to join, aerospace engineering, changed the town forever. Engineers do that.

New products like aircraft, satellites, computers, the internet, wireless communications, and robotic manufacturing change everything—from commerce to entertainment to education to jobs. With the development of the civil turbojet aircraft, the British “holiday makers” (as they were called back then) soon found Spain, Italy, Greece, and other places where sunshine was reliable and beaches had warm white sand. Bournemouth’s hotels were slowly shuttered, converted into condominiums, or demolished for homes or stores. The town was in decline. Now, 30 or more years later, it has transformed itself, home to new IT-focused businesses, new healthcare facilities, weekend vacation homes, and many small specialty engineering companies. Bournemouth is just one example of how everything must continually reinvent itself in response to changing circumstances and new technologies.

As David Grier’s history of our early years in this magazine describes [see page 8], SEAS, like Bournemouth, has undergone its own transformations. Two world wars came and went, new technologies and disciplines emerged, and SEAS evolved from a small night school that provided engineering education in a very limited range of disciplines to a large, residential school with many undergraduate and graduate offerings and strong and growing off campus graduate programs for working professionals from across the nation. Now, once again we must adapt to changing circumstances. In a world of global connectedness and outsourcing, and in the face of national challenges in technology, science, and healthcare, we must reinvent ourselves to prepare our students for success in this new world.

Transformations: we engineers initiate them, but we can experience them, too. My own transformation started when I left Bournemouth at age 18 to study aeronautical engineering at London University. At 21, armed with my bachelor’s degree, I joined Hawker Siddeley Dynamics as an aerodynamicist, working on short range, supersonic, air-to-air missiles. I had no idea that one day I would be an engineering professor, but on reflection, those early days were formative in shaping my views of what engineering education was, and must be. I realized quickly how essential lifelong learning was, and how grateful I was that my professors and courses had given me a thorough grounding in fundamentals on which I could build, and learn on my own.

Excellent professors can change a student’s life, but they can also change an institution. Our transformation at SEAS must include attracting additional world-class faculty. This is not an easy task; the competition for the best and brightest faculty is fierce and relentless, and building such a faculty requires endowments and other financial resources. Endowed chairs and professorships play a crucial role in attracting the leaders who will build nationally recognized educational and research programs.

Building on the fundamentals my professors taught me, I also realized at Hawker Siddeley Dynamics that in the world of missiles, where so much technology from so many different disciplines is packed into a compact space and must work seamlessly together, success hinges on “teamwork” and an ability to see and appreciate the “big picture.” Electronics and software had to interface and overlap with aerodynamics and propulsion systems, guidance and control systems and actuators, and all had to work seamlessly together for the mission to be accomplished.

The same can be said for “launching” our graduates onto their professional path: as engineering educators, we must make sure that our graduates are prepared to thrive in, and lead one of these seamless teams that may be spread across the globe, cutting across cultures and time zones, as well as disciplines. Today this is needed more than ever; few professions are as internationally based and organized as engineering now is. Design, manufacturing, and supply chains stretch across the globe and work goes on 24/7. As you read these words, design teams in Moscow may be completing tasks started by colleagues in Seattle who in turn took over work started in Japan hours earlier. At SEAS we are working hard to provide opportunities for students to have an international engineering experience, to gain this understanding and perspective.

My own international engineering experience came after two years of missile design at Hawker Siddeley Dynamics. I returned to graduate school, enrolling at the von Karman Institute for Fluid Dynamics in Brussels, Belgium, as the proud and happy holder of a fellowship that paid tuition and living expenses. I still have the letter announcing that award, which I had waited for with bated
breath. It was a godsend, a lifeline. Without it I would never have attended graduate school and now am ever mindful that that same situation is faced by many today.

A lifeline: that is what financial aid is for students who have the passion, but not the financial resources, for college or graduate study. But the benefits of financial aid accrue to SEAS, too, since attracting the best students is one of the necessary paths to growing in reputation and stature. Every engineering school has plans to grow in stature, and none of our competitors is standing still—so neither should we be. SEAS already has a large number of energetic, motivated, and very bright students, but expanding our merit and need based scholarships is essential to recruit and retain the undergraduate students we want and need.

From the moment freshmen step onto campus in the fall, families entrust them to our care, to transform their lives and prepare them for success in the world. It is not just a responsibility but a privilege, and nothing is more rewarding. I learned this when, after four years at the von Karman Institute, I was offered a post-doctoral position at Princeton University. It was there that I had my first opportunity to teach classes and there that I discovered a passion for teaching, and the responsibilities it brings with it.

We want to engage and empower students as never before. This is a challenge, because the changing lifestyles of our students, and a changing workplace, make it imperative to explore new teaching paradigms and tools. We need to foster and encourage the development of technology driven learning environments in which laboratories can be integrated into regular classroom activities, where students can learn in studio-type classrooms, and where they can work on curricular and extra-curricular projects in custom-equipped project spaces.

Modern, sophisticated, and flexible laboratories, classrooms, and workspaces will help us to accomplish this. The university’s Board of Trustees at its February meeting approved expenditures of up to $10 million for engineering and architectural studies for a new building, to be shared with groups from the natural and life sciences and to provide the interdisciplinary environment we need. This new building—a powerful magnet in the heart of the nation’s capital to draw world-class faculty and students—is a core element in achieving our vision. It will create a hub for technology exchange and education, workshops, development of start-ups with our partners, and technology education across the D.C.-Metro area. Close proximity to policy experts, business experts, and lawyers with expertise in entrepreneurial and intellectual property matters will offer our students an environment that others cannot emulate and will provide a unique background to succeed in today’s complex world.

This will be a stretch for us; but that’s okay. I learned that lesson—that stretching is a good thing—at Princeton, where I was fortunate to work under the late Professor Seymour Bogdonoff. He gave me responsibilities and made me stretch, often beyond my comfort zone. He understood that a sense of achievement, building inner confidence, does not come from doing easy things; it evolves out of struggle and hard work. Lessons learned with Boggy, as we called him, stood me in good stead at the University of Texas at Austin as I built a supersonic wind tunnel laboratory, developed and taught my classes, passed through the ranks of assistant to associate to full professor, became chair of my department, and then associate dean for academic affairs for the School of Engineering.

And this brings me to the present, here at SEAS. Many factors influenced my decision to take the post of dean of SEAS, but two dominated. During visits to GW, the strong commitment that the Board of Trustees, President Knapp, and other high level leaders had made to strengthening engineering and science at GW was palpable, and their enthusiasm was contagious. The strong commitment to that same end of the SEAS faculty, students, and alumni I met during those interview trips was equally compelling. On the airplane back to Austin after my third and final visit, I recall thinking that a once-in-a-lifetime opportunity was presenting itself, to me and to SEAS, and it could not be turned down. There was a perfect alignment of chance and choice. The chance to grow, to improve, was being offered. We have chosen to embrace that chance.

**THE ON-RAMP:** “We are developing grand plans, but we are doing so in conjunction with you. As a SEAS stakeholder, I ask you to take the on-ramp onto the SEAS highway and join us in the work ahead.”
It comes at a propitious time. From the White House cabinet room to kitchen tables in millions of homes, there is a dawning realization that as never before, education, engineering, and science are keys to our future health and prosperity. The nation faces many technological challenges: energy independence and securing a sustainable future; the urgent need for computer security, information assurance, and privacy for a myriad of commercial, medical, homeland security, and defense needs; the demand for ever more powerful computers for design and simulation of products and processes from pilotless aircraft to pharmaceuticals to robotic surgery; development of new safety technologies and regulations as fully electric and lightweight vehicles come on line; and nanotechnology, in which natural and man-made materials are exploited for applications from pharmaceuticals to electronics to improving water quality worldwide. These are all challenges that SEAS has recognized and they are areas in which we have a strong or growing presence.

In short, we are developing grand plans. We are rolling up our sleeves and getting down to work. But we are doing so in conjunction with you and with GW. As I have said many times, no one person, no one group of stakeholders, can do it alone. Only as a team working together will we succeed, and every one of us has a role to play.

For some of you, this may mean becoming a mentor to a first-year student, or serving on resume writing workshops that provide advice to graduating seniors, or developing an alumni chapter in Rockville or Riyadh. Others can help support student design projects with your time and financial resources. Others may be able to endow a scholarship in the name of a family member or beloved faculty member, or contribute to a scholarship in a graduating class’ name. Endowed scholarships are the most amazing of gifts. They give in perpetuity.

Some of you may be able to help establish a chair or endowed professorship, or spend an afternoon with us and give a lecture in a SEAS seminar series. Seminars can change lives, sometimes unbeknownst to any of us. The passion you express for your subject may ignite a fire in a sophomore or a senior, change his direction, give her life a new focus. Others of you, perhaps reflecting on a successful career, may have the resources to help us make our dream of a new building come true. Everybody has a chance to make a difference; it is just a question of choosing how.

Above all of this, I urge you to get involved, because unanticipated and interesting forks in the road appear on every journey; people come into your life and change what you think and who you are, and from this, opportunities arise that you would never have imagined. As a SEAS stakeholder, I ask you to take the on-ramp onto the SEAS highway and join us in the work ahead.

I will end by saying I feel very lucky, and privileged, to serve as dean of SEAS. We have a strong school, a tremendous launching pad from which to go forward. I look forward to meeting you in the months ahead. If you are in D.C., look me up; if you are planning a trip to D.C., call ahead, let’s have coffee or lunch. There is no combination I enjoy more than meeting you and “talking SEAS.”
Muriel Dumit
Seeing Connections and FINDING HER PATH

Muriel Dumit seems frequently to think in terms of connections. She connects interests to possibilities, experiences to her academics, and people to places. Now a senior, she looks back at her four years at SEAS and GW and at the experiences that helped shape her decisions, and she talks about some of these connections.

After her junior and senior years of high school, Dumit was nominated to be a student ambassador to Japan and Australia, respectively, through the People to People Student Ambassadors Program. It was during her trip to Australia that she had one of her “ah-hah!” moments: “When I was in Australia, we got to climb the Sydney Harbor Bridge,” recalls Dumit. “I was looking into civil engineering, and that was the first time when I was really impressed by what civil engineering was. Seeing the bridge sort of opened up my eyes to it.”

As she began to think about college, she already had a connection to GW and SEAS. Both of her older sisters studied at SEAS, and as Dumit explains, “They had such positive experiences and they were talking about it so much that I had to experience it myself. I came to visit, and people were so welcoming and I felt at home.” While she followed in the steps of her sisters in choosing to study at SEAS, she set her own course in selecting her major. “I was exposed to what my sisters did in terms of engineering, but I wanted to find my own path,” she remarks.

Her own path is civil and environmental engineering. “I want to go into international development, and I want to use water, water treatment, and waste water treatment as development tools. More than two billion people don’t have access to clean water, and environmental engineers can help because they can prevent diseases in the first place, rather than treating diseases. I’d like to go into research and come up with a concept that can help make a difference,” explains Dumit.

To help achieve her goal, Dumit took a summer internship with the District of Columbia Water and Sewer Authority under the guidance of her advisor, Professor Rumana Riffat. She was placed on a pilot project at Alexandria Sanitation Authority to examine the use of anammox bacteria in order to see if the project could be implemented in Alexandria. She was able to convert it into a year-round internship, and again found connections with her goals. “I found that I actually really enjoy research, and this clarified what I want to do in the future.” When prompted for an elaboration, she continues, “I wasn’t just photocopying. I was involved and had actual responsibilities. Just the hands-on experience that I got solidified my love for what I was doing and really convinced me that this is what I want to do. The fact that I was able to apply the classroom knowledge and see how it worked in the real world clarified it for me. It sunk in that what I was learning in school and at my internship reinforced each other.”

In addition to her research experience and academic achievement (she has made the Dean’s Honor List every semester), Dumit has managed to find time throughout college for several outside activities, including the GW chapters of Engineers Without Borders and the Society of Women Engineers, the SEAS student mentoring program, and others.

Dumit plans to continue her studies at SEAS next year, enrolling as a graduate student. Perhaps down the road this will be one more connection for her.
Bill Westenhofer
Combining Talents and **FINDING SUCCESS**

There was never a grand vision in Bill Westenhofer’s mind, a plan that would take him all the way from art student and sometimes-computer buff to Oscar winner, but win an Oscar he did. Westenhofer and his colleagues Michael Fink, Ben Morris, and Trevor Wood were awarded the 2008 Achievement in Visual Effects by the Academy of Motion Pictures Arts and Sciences for his work on the film *The Golden Compass*.

This was not the first time that the entertainment industry has recognized his talent. In 2005, Westenhofer was nominated for an Oscar in the same category for *The Chronicles of Narnia: The Lion, the Witch, and the Wardrobe*, and last year the Orange British Academy Television Awards also nominated him for his work on *The Golden Compass*. And his success goes back even further. “My first nomination of any kind was actually for *Babe II*. I got nominated for the British Academy Award for that job,” recalls Westenhofer.

Westenhofer credits his success to being in the right place at the right time, but as he speaks about the path he traveled to the Oscar, it becomes clear that his success is not simply a matter of good fortune. Early on, he combined a talent and lifelong love of art with an interest in computers, and that combination has given him a real advantage in his career.

It started in high school when his art teacher suggested that he look into computer graphics as a way to combine the two. He studied computer engineering as an undergraduate at Bucknell University, and then came to GW for his master’s program.

“With GW,” he explains, “my thought was that I was going to come in, get a computer science master’s degree and whenever I could, I’d do independent studies in computer graphics. But, little did I know, [Professor] James Hahn had the computer graphics group running. It turned out to be a perfect fit. I couldn’t have asked for a better program for doing what I wanted to do with a computer science degree.”

Westenhofer still values the technical education he received. “The applications of computer graphics are something that I still use every day,” he explains. “My career now is a little less technical, it’s more the artistic side, but having the engineering background and knowing how the systems work, I’m a lot more effective in suggesting ways of attacking the creative things that I want done. So, I can ask an artist to do something and I know how it’s going to work and I know how realistic my request is.”

Westenhofer loves the creative side of his job, and that is readily apparent in his conversation. When asked specifically what he loves most, he replies, “There’s a moment when you’ve been working on something for a long time, especially a digital character. You’ve spent months trying to get the character to look right, and you finally put it in the shot, and there’s almost a moment when it clicks over and it goes from something that you’ve created by hand to something that’s almost living. I remember it with Aslan the lion. When that happens, I’ll just sit and look at the shot in my office and play it over and over again. It’s wonderful.”

And as for the Oscar? Westenhofer muses, “It’s still absolutely surreal. It’s not something I ever expected. I still come home and see it on the mantelpiece and it’s kind of shocking.”
NCAC Wins $19 Million Grant

The National Crash Analysis Center (NCAC), based on GW's Virginia Campus, has won a five-year, $19 million research grant from the U.S. Department of Transportation's Federal Highway Administration.

This major grant continues the NCAC's longstanding efforts to promote advanced crash analyses technologies that improve highway and vehicle safety and infrastructure security. It also marks more than 15 years of collaboration among the Federal Highway Administration, the National Highway Traffic Safety Administration, and GW.

The NCAC was chartered in 1992 as part of SEAS and for the past 15 years has “developed unique capabilities in crash analysis, crash data statistics, simulation and modeling, and vehicle and barrier design,” according to the center’s director, Professor Cing-Dao “Steve” Kan.

“The capabilities, expertise, and resources housed within the National Crash Analysis Center are not duplicated elsewhere in the world at this level,” explains Kan. “For example, we have vehicle computer models that allow us to take a vehicle completely apart and rebuild it part by part. Once completed, these models can be used for different impact applications and are available on our Web site for researchers and the government to download. No one else develops these types of models.”

The NCAC’s 40-member staff and graduate students conduct vehicle safety and biomechanics research, highway safety and infrastructure research, and simulation and advanced computing research. They also run full-scale crash testing and composite and material tests at the Federal Outdoor Impact Laboratory in McLean, VA. The center also houses the National Crash Analysis Center Library, the largest and most comprehensive source of crash test data and vehicle safety reports in the nation.

“The NCAC is also examining the impact of hybrid and electrical cars on road safety,” says Kan. “In doing so, we provide data that help both government craft appropriate legislation and the automotive industry produce better and safer vehicles. One of our key assets as a research organization is that we can help the government and industry work together to address the technical issues of new innovations and technologies,” he says. “This is just one of the many unique features of our center.”

Research Team Demonstrates “Voter-Verifiable” Voting System to Media

In late October of last year with the national elections fast approaching, Professor Poorvi Vora and doctoral student Stefan Popoveniuc of the Department of Computer Science (CS) demonstrated their “voter-verifiable” voting system research to members of the media at a breakfast meeting. CS Professor Rahul Simha and doctoral student Ben Hosp also attended the breakfast and participated during the question and answer session with the media.

Because the topic was so timely, SEAS received an unusually high amount of publicity from the meeting, with the research covered by WMAL, WAMU (Washington, D.C.’s National Public Radio affiliate), The Washington Times, Voice of America (radio, broadcast, and Web), and Medill News Services.

With approximately two-thirds of Americans casting their votes in the presidential elections on paper ballots, Vora and Popoveniuc’s presentation addressed the question, “How can voters be assured their votes are counted and kept private?” They demonstrated for the media their “voter-verifiable” voting system, Scantegrity.

Scantegrity involves optical scan ballots and invisible ink, and provides a fool-proof way for voters to ensure their ballots are collected and correctly tallied. It is the only such system in the country that can be used with current optical scan ballots, and it does not change the voting experience for users.

Under the Scantegrity system, each optical scan ballot has a serial number, and every choice on the ballot has a special confirmation number attached to it. Using a special pen, voters select their choices, and when they do so, a special confirmation number associated with each choice is revealed; this number does not reveal the voter’s choice. The confirmation numbers are posted publicly following the election, and voters can check to see that their confirmation numbers have been recorded. To obtain the election tally, the list of confirmation numbers is decoded in a manner that can be verified by any organization or individual who wishes to check the mathematics. The decoding and the verification do not reveal the candidate choices of a voter.

Scantegrity is a joint project of University of Maryland, Baltimore County; Massachusetts Institute of Technology; University of Ottawa; University of Waterloo; University of Newcastle upon Tyne; GW; and David Chaum, its chief inventor.
The GW inaugural float parades down Pennsylvania Avenue.

SEAS Plays Key Role in GW Inaugural Float Success

On January 20, 2009, GW had the honor of being a part of the presidential inaugural parade; the GW float that processed down Pennsylvania Avenue was the only university-affiliated float in the parade.

The float was a great success, one that made both GW and SEAS look good, but it didn’t come without much effort. It required countless hours of work by a group of GW students, staff, and faculty—all of them volunteers—whose efforts helped give GW a few moments in the national (and international) spotlight.

Citing the student involvement, Dean David Dolling said, “Thirty-five students from across GW participated in building the float; among them were our own SEAS students: Sible Antony, John Bermingham, Jonathan Binetti, Andrew Breest, Max Dandridge, Murrad Kazalbash, Matt Knouse, Matthew Mancuso, Gregory McEntegart, Christine Penfold, Caitlin Stahl, Shayna Weinsheil, and Gabriel Yessin. SEAS student and Student Association President Vishal Aswani and GW senior Charlie Burgoyne merit special mention for their leadership of the project.”

SEAS faculty and staff were integral to the project, as well. Michael Veedock, SEAS administration staff, took on the role of trolley design lead, while Stephen Pothier, a senior research scientist, and Roger Cortesi, a lecturer, both of the Department of Mechanical and Aerospace Engineering (MAE), provided structure, organization, leadership, and wise mentoring to keep the project on target and on time. They had the support of Michael Plesniak, chairman of the MAE department, and Professor Roger Kaufman, who provided many just-in-time, mechanical engineering feats.

SEAS Celebrates “E-Week” 2009

SEAS students set a high bar for themselves this year in planning and carrying out activities to celebrate National Engineers’ Week, and they cleared it with room to spare. Led by SEAS Engineers’ Council, the students organized more than 30 events—everything from speakers and educational displays to contests, competitions, and games—that made for a wonderful combination of fun and learning experiences during the February celebration.

The culmination of the week’s activities was the Engineers’ Ball, held that Friday evening at the Andrew W. Mellon Auditorium, not far from campus. “E-Ball,” as it is known, is a student-centered event, but a number of the school’s friends also attended, including GW President Steven Knapp and Mrs. Knapp, SEAS National Advisory Council members, and several alumni. The evening included a dinner, dance, and an awards ceremony.

Prior to the ball, students had the opportunity to vote for the Professor of the Year in each of the five SEAS departments, and the winners were announced that evening. The winners of the 2009 Professor of the Year awards are: Professors Sameh Badie of the Department of Civil and Environmental Engineering, Abdou Youssef of the Department of Computer Science, Shahrokh Ahmadi of the Department of Electrical and Computer Engineering, Lile Murphree of the Department of Engineering Management and Systems Engineering, and Ryan Vallance of the Department of Mechanical and Aerospace Engineering. Awards were also given to two seniors, Sible Antony and Kachi Odoemene, for their leadership and involvement at SEAS.

In short, the evening was a terrific success. Said Dean David Dolling, “The smiling faces, the laughter, the overall noise level, the endless flashing of cameras, and the numbers who stayed around to the very end make me think students, faculty, and our guests all had a great time. If you missed it, don't worry; there'll be another one in February 2010.”
SEAS Receives ABET Diversity Award
In October of last year, Associate Dean Martha Pardavi-Horvath accepted a 2008 ABET President’s Award for Diversity on behalf of the School of Engineering and Applied Science. ABET, the recognized accrediting agency for college and university programs in applied science, computing, engineering, and technology, presents these awards annually to schools and universities, individuals, associations, and firms to recognize their extraordinary success in achieving or facilitating diversity and inclusiveness in the technological segments of American society.

According to the citation on the award, SEAS merits this award “For its commitment and achievement in hiring female faculty and in recruiting, retaining, and graduating a significant number of women in undergraduate and graduate engineering programs while providing the graduates with leadership skills and opportunities as they enter engineering practice.”

In addition to SEAS’ achievement in hiring female faculty into our engineering programs, ABET congratulated SEAS for its success in attracting women to our graduate programs, where 27.8 percent of our master’s candidates and 26 percent of our doctoral candidates are female. ABET also noted that SEAS has significantly increased activities for female engineering students through our Society of Women Engineers (SWE) chapter and our active peer mentoring network. These efforts have helped with the recruitment and retention of female engineering students at GW. In addition, this environment has provided women graduates with an extraordinary learning experience.

Congratulations go out to all at SEAS who work to make our school a welcoming environment in which all can thrive.

GW Establishes New Institute for Nanotechnology
Sixteen faculty in SEAS and the Columbian College of Arts and Sciences founded the GW Institute for Nanotechnology (GWIN) last fall, after receiving financial support from the university under an initiative that fosters promising areas of research and academic programming at GW. Led by Professor Ryan Vallance of the Department of Mechanical and Aerospace Engineering, GWIN brings together faculty from mechanical and aerospace engineering, electrical and computer engineering, civil and environmental engineering, physics, chemistry, and biochemistry.

Nanotechnology, a field at the intersection of science and engineering, studies and applies natural and man-made materials with dimensions below 100 nanometers. It attempts to manipulate matter through the fabrication of nanostructures and engineer new applications for medicine, computing, data storage, and energy. To understand the scale of nanotechnology, Vallance helpfully explains, “a thousand 100-nanometer particles placed side by side equals the average width of a human hair.”

GWIN will undertake research projects related to nanostructured materials and their properties, applications, and devices, incorporating nanostructures, computational modeling and analysis, and nano manufacturing and metrology. Projects underway include developing a system for nanopatterning with scanning tunneling microscopy, studying the growth of carbon nanotubes, computational mechanical modeling of nanomaterials, researching nanomagnetics, and filtration with nanostructured materials.

GWIN’s efforts in nanotechnology will also be an important addition to the university’s engineering and science education programs. “Nanoscale phenomena are frequently incompatible with our classical intuition and experiences,” explains Vallance. “Traditional engineering theories, like continuum mechanics, which engineers have used for over a century to design new devices, break down in nanotechnology. We now have to teach students additional physical, chemical, biological, and statistical principles that govern nanotechnology. GWIN can help us incorporate nanotechnology into our educational programs, both at the undergraduate and graduate levels.”

Dean David Dolling is very supportive of the new institute, adding, “Nanotechnology is a vital area of national importance with applications across a wide spectrum from medicine to electronics to improving water quality world-wide. National laboratories, federal agencies, and private sector corporations all recognize the untapped potential for discoveries in this emerging field, and I believe that our engineers and scientists will be among those who unlock some of its exciting secrets. GWIN facilitates their task by creating an infrastructure that fosters multi-disciplinary efforts and provides research support.”
SEAS Faculty Advance Wide-Ranging Research Interests

SEAS faculty are engaged in a wide range of research, for which they have received more than $8.4 million in funding thus far this year. A sampling of this ongoing research demonstrates the breadth of both the topics and the funding provided for them.

Last fall, five faculty from the Department of Computer Science received a total of $1.32 million in grants from the National Science Foundation (NSF) to support their research. Professors Rahul Simha and Bhagirath Narahari received a $600,000, four-year grant from the NSF’s CyberTrust program to support their ongoing research, which explores how additional hardware can be utilized to provide more secure computer systems. Professor Poorvi Vora received a two-year, $164,000 NSF grant, also from the CyberTrust program, for research on voting systems, and she also received another NSF grant to study statistical cryptanalysis of block ciphers as channel communication. Professors Xiuzhen “Susan” Cheng and Hyeong-Ah Choi received a four-year, $330,000 grant to study a number of fundamental problems critical to mesh network throughput optimization—a process that attempts to optimize the total amount of traffic delivered through a network within a unit of time. Separately, Professor Choi received a two-year, $100,000 grant for a project that studies resource management in secure open wireless networks.

Four other SEAS faculty also are conducting research under NSF grants that they have received this year. Professors Rajat Mittal and Ryan Vallance of the Department of Mechanical and Aerospace Engineering (MAE) received a three-year, $240,000 grant to analyze the flight of butterflies in GW’s Center for Biomimetics and Bioinspired Engineering Lab, while MAE Professor Michael Plesniak was awarded a two-year, $240,000 grant to support a project entitled “Unsteady Flow Phenomena in Models of Curved Arteries with Stents.” In the Department of Civil and Environmental Engineering, Professor Majid Manzari received a three-year, $235,000 grant to support a project that aims to develop theoretical and computational methods that enable engineers to evaluate the seismic response and stability of certain civil infrastructure systems.

Meanwhile, several SEAS faculty members have been working on research funded this year by other entities outside GW. Professor Jason Zara, of the Department of Electrical and Computer Engineering (ECE), was awarded two sponsored projects from Imalux Corporation to investigate new technologies for epithelial cancer detection using optical coherence tomography. MAE Professor Charles Garris is working with Multiaqua Corporation to commercialize his patented invention, the supersonic pressure-exchange ejector, and MAE Professor Andrew Cutler is part of a multi-institutional team that was successful in winning the competition for the Air Force Office of Scientific Research/NASA National Hypersonics Research Center in Propulsion. This center, to be called the Center for Hypersonic Combined Cycle Flow Physics, is led by the University of Virginia, and the GW subcontract is for $1.06 million over five years.

Three faculty in the Department of Engineering Management and Systems Engineering (EMSE) have been undertaking emergency management-related research for both the U.S. Government and the Government of the Netherlands. Professor Joseph Barbera was awarded $343,000 for a project to support the professional development of Veterans Health Administration personnel in the area of health care emergency management, while Professor Gregory Shaw received a contract from the Federal Emergency Management Agency to update its university-level course, Business Crisis and Continuity Management. Professor Shaw is also working with Emeritus Professor John R. Harrald as part of a U.S. team that is acting as observers for the Netherlands National Flood Exercise and providing observations and comparative practices through reports and presentations to Netherlands government officials and emergency management personnel.

SEAS faculty have also received a number of GW-sponsored research grants this year. ECE Professor Matthew Kay received a Dilthey Award from GW for research on “Endocardial Sources of Ectopic Activity During Cardiac Ischemia and Low-Flow Reperfusion,” while MAE Professor Pinhas Ben-Tzvi received a University Facilitating Fund Award for his research on “A Precise Piezoceramic Actuated Dispensing Array for Microdrops Generation and a Vision Based Testing Setup.” In addition, SEAS faculty won four of the eleven awards sponsored by GW’s newly-created Institute for the Analysis of Solar Energy. Two of the awards were given to EMSE Professor Jonathan Deason, one to ECE Professor Robert Harrington, and one to Professor Emeritus Lance Hoffman and co-principal investigators Professor John Sibert and senior research scientist Costis Toregas, all of the Department of Computer Science.

In addition to research grants, SEAS faculty have also had success with patents this year. U.S. Patent Number 7,420,724 was issued to ECE Professor Jason Zara and his collaborators earlier this year, while MAE Professor Charles Garris had a U.S. patent allowed, entitled “Pressure Exchanging Ejector.”
Dr. Pinhas Ben-Tzvi

Pinhas Ben-Tzvi is an assistant professor in the Department of Mechanical and Aerospace Engineering. He received his Ph.D. in mechanical engineering from the University of Toronto and previously worked on medical diagnostic robotic systems at General Electric Medical Systems. His research interests are focused on the advanced mechanics and control of mechatronic and robotic systems, the design of intelligent autonomous systems, and the application of smart materials for the development of novel sensors and actuators for biomedical and miniature mechatronic and microrobotic systems.

Dr. Samer Hamdar

Samer Hani Hamdar comes to GW from Northwestern University Transportation Center, where he earned his Ph.D. in civil and environmental engineering and was a research assistant. He is an assistant professor in the Department of Civil and Environmental Engineering, and his primary research interests include driver and pedestrian behavior modeling, traffic flow theory, intelligent transportation systems, transportation planning and evaluation, transportation safety, evacuation modeling, and disaster management.

Dr. Yongsheng Leng

Yongsheng Leng earned his Ph.D. in mechanics and tribology (the science of friction, lubrication, and wear between two solid surfaces) from Tsinghua University (China). Before joining SEAS, he was a research assistant professor of chemical engineering at Vanderbilt University. His research interests include computational nanotribology, molecular modeling of self-assembly at organo-metallic interfaces, nanomechanics, mechanical property of metal nanowires, and the development of computational methodology. He is an assistant professor in the Department of Mechanical and Aerospace Engineering.

Dr. Howie Huang

Howie Huang comes to GW from the University of Virginia, where he received a Ph.D. in computer science. He is an assistant professor in the Department of Electrical and Computer Engineering, and his research interests include computer architecture, operating systems, data-intensive computing, power-aware systems, and high-performance computing.

Dr. Stephen Hsu

Stephen Hsu is a professor in the Department of Mechanical Engineering. He has a wide range of experience and expertise dealing with energy efficiency, materials, energy, and manufacturing, and he leads SEAS efforts in the broader field of energy. Hsu began his career at Amoco Research Center, then joined NIST as a research scientist. At NIST, he conducted research on materials, measurements, and metrology, and he interfaced extensively with U.S. industries on materials metrology issues. He also led international cooperative research programs on advanced materials for more than 20 years.

Hsu has published more than 250 papers, books, and articles, and holds seven U.S. patents. He is a Fellow of the American Society of Mechanical Engineers and the Society of Tribologists and Lubrication Engineers and has received many awards. He has served in various academic positions at Northwestern University, Pennsylvania State University, the University of Maryland, and the City University of Hong Kong, and has graduated more than 70 students and post-docs over the years. Hsu earned his Ph.D. in chemical engineering from Pennsylvania State University.
Dr. Baoxia Mi

Baoxia Mi is an assistant professor in the Department of Civil and Environmental Engineering. Before joining SEAS, she was a postdoctoral research associate in the Department of Chemical Engineering at Yale University. Her research has focused on physicochemical processes emphasizing novel membrane technologies and nanomaterials for water-related applications. Mi earned her Ph.D. in environmental engineering from the University of Illinois at Urbana-Champaign.

Dr. Nan Zhang

Nan Zhang received his Ph.D. in computer science from Texas A&M University and is a National Science Foundation Career Award winner whose research interests include security and privacy issues in databases, data mining, and computer networks. He has joined SEAS as an assistant professor in the Department of Computer Science; prior to that, he was an assistant professor of computer science and engineering at the University of Texas at Arlington.

Michael Plesniak Joins SEAS as Department Chairman

SEAS is pleased to introduce our new Department of Mechanical and Aerospace Engineering chairman, Professor Michael W. Plesniak.

Professor Plesniak joined the SEAS faculty on August 1, 2008. He was formerly a professor of mechanical engineering at Purdue University, the Eugene Kleiner Professor for Innovation in Mechanical Engineering at Polytechnic University of New York, and the director of the Fluid Dynamics and Hydraulics Program at the National Science Foundation (NSF).

Plesniak has made significant contributions to education and research in the discipline of fluid dynamics. His specific contributions are in the field of turbulent flow physics for applications ranging from gas turbine cooling to biological flows. He has authored over one hundred refereed archival publications and conference papers, over fifty non-refereed publications and presentations, and has presented numerous invited seminars and keynote addresses.

Among his distinctions, Plesniak is a Fellow of the American Society of Mechanical Engineers and of the American Physical Society. He is an Associate Fellow of the American Institute for Aeronautics and Astronautics (AIAA), and a member of Sigma Xi, the Scientific Research Society.

Plesniak has been active in the American Society of Mechanical Engineers as a member of the Fluid Mechanics Technical Committee and the Honors and Awards Committee, and as associate editor of the Journal of Fluids Engineering. He is also a member of AIAA’s Public Policy Committee and Fluid Dynamics Technical Committee, and he serves on the Infrastructure Issues Team of the Center for the Study of the Presidency and Congress (CSPC). The CSPC is a public policy advocacy group that advised President Obama’s transition team and is making recommendations to the president on policy issues.

Plesniak received his Ph.D. in mechanical engineering from Stanford University, and B.S. and M.S. degrees from the Illinois Institute of Technology.
Retiring Faculty
SEAS salutes our recently retired faculty member, JOSEPH PELTON, RESEARCH PROFESSOR OF ENGINEERING.

Professor Joseph Pelton was a member of the GW faculty from 1999 to 2008 and a research professor of engineering in the Department of Electrical and Computer Engineering.

After 30 years in the satellite communications field, Pelton joined GW in 1999, working initially with the Institute for Applied Space Research (IASR) and then serving as director of the master of science program in telecommunications and computers, located at GW’s Virginia Campus. He later consolidated the research projects he had at the Virginia Campus and the activities of the IASR to create the Space & Advanced Communications Research Institute (SACRI).

Pelton’s research work at GW included advanced satellite design concepts for the Communications Research Lab of Japan and the National Institute of Information and Communications Technology, three major studies on space safety related to the Space Shuttle, research for Northrop Grumman, setting up a communications research lab at the Virginia Campus under sponsorship from the State of Virginia’s Center for Innovative Technology, and computers, located at GW’s Virginia Campus. He later consolidated the research projects he had at the Virginia Campus and the activities of the IASR to create the Space & Advanced Communications Research Institute (SACRI).

SEAS Establishes Faculty Excellence Awards
SEAS established its own teaching and research awards this year to recognize faculty who are making outstanding contributions to the school as teachers or researchers, and the school celebrated the four winners at an awards reception on April 16.

Professor Rahul Simha of the Department of Computer Science was selected as the 2009 SEAS Distinguished Teacher. Throughout his career, he has made significant contributions to course and program development, particularly interdisciplinary programs, and he has developed innovative teaching practices and an impressive set of course materials. He also has a particularly impressive record of engaging undergraduates in research projects. As one of his nominators testified, “By enabling us to uncover theories with our own minds, Professor Simha built our foundation to become better learners. We became passionate about our studies and we became hungry to come back to class for next week’s adventure.”

Professor Jason Zara of the Department of Electrical and Computer Science was chosen as the 2009 SEAS Outstanding Young Teacher, because of his excellent teaching record over a broad range of classes and his significant contributions to program development. He has a passion for teaching, student advising, innovative teaching practices, and student mentoring and service to the student community. “Professor Zara ensures students understand his material and allows students to continually question him about material until he sees that you understand the concept,” noted one of his nominators.

Professor James Lee of the Department of Mechanical and Aerospace Engineering received the 2009 SEAS Distinguished Researcher Award because of his truly distinguished record as a scholar and researcher. Of particular note is his prolific record of publication in top-quality journals, and the impact of his work in a number of areas, including continuum mechanics, fracture mechanics, structural control, and more recently, micro-continuum mechanics, multiscale modeling, and meshless methods. His recent work on the development of a multiscale field theory that unifies molecular and continuum mechanics is a landmark achievement in the mechanics of materials.

Finally, Professor Michael Keidar, also of the Department of Mechanical and Aerospace Engineering, received the 2009 SEAS Outstanding Young Researcher Award. Professor Keidar has built an outstanding scholarly record that includes a prolific history of publishing in top quality journals. He is on his way to building a world-class research program in plasma physics and applications at GW and has initiated new and promising work here in biomedical engineering.

These award winners were recommended by two committees of their peers selected by Dean David Dolling. The teaching awards committee was chaired by Professor Jonathan Deason, and included Professors Rumana Riffat, Roger Kaufman, Nicholas Kyriakopoulos, and Bhagirath Narahari. The research awards committee was chaired by Professor Rajat Mittal, and included Professors Hyeong-Ah Choi, Branimir Vojcic, Majid Manzari, and Johan Rene van Dorp.
Faculty Accomplishments
SEAS congratulates our faculty for their various notable achievements this year. The accomplishments below represent a sampling of the successes of faculty across our five departments: Civil and Environmental Engineering (CEE), Computer Science (CS), Electrical and Computer Engineering (ECE), Engineering Management and Systems Engineering (EMSE), and Mechanical and Aerospace Engineering (MAE).

Awards & Honors
Jonathan Deason (EMSE): appointed as a member of the International Scientific Committee of the Urbenviron International Association for Planning and Environmental Management. Professor Deason was also appointed a member of the editorial advisory board of Urbenviron Journal in November.

Azim Eskandarian (CEE): invited to serve on the IEEE-USA Committee on Transportation and Aerospace Policy, which is one of the IEEE legislation committees that advise the U.S. Congress on policy issues representing the IEEE’s positions.

Howie Huang (ECE): selected as the recipient of a 2008 IBM Real Time Innovation Award for his proposal “Hippo: High-Performance POwer-aware System - Building Green Computers with IBM Real-time Java Technology.”

Michael Keidar (MAE): elected an associate fellow of the American Institute of Aeronautics and Astronautics. In addition, Professor Keidar’s paper, “Plasma flow and plasma-wall transition in Hall thruster channel,” was selected by the Physics of Plasmas Journal as one of the most highly-cited papers from 50 years of plasma physics.

Michael Plesniak (MAE): elected a Fellow of the American Physical Society and invited to become a member of the American Institute of Aeronautics and Astronautics' Fluid Dynamics Technical Committee. Professor Plesniak was also invited to serve on the Infrastructure Issues Team of the Center for the Study of the Presidency and Congress (CSPC). The CSPC is a public policy advocacy group that advised President Obama’s transition team and will be making recommendations to him on policy issues.

Rajat Mittal (MAE): invited to join the Journal of Computational Physics as associate editor and the National Science Foundation Tera-Grid Resource Allocation Committee as a member.

Michael Stankosky (EMSE): named editor emeritus of VINE, the journal of information and knowledge management systems.

Media Mentions
Rajat Mittal (MAE): received plenty of media attention for his swimming research last summer during the approaching, and later ongoing, Olympics. National Public Radio, Popular Science, and Popular Mechanics, among other media, interviewed him for radio news programs and print articles.

Julie Ryan (EMSE): participated in a National Public Radio show on cybersecurity along with fellow guests John Arquilla and Scot Borg. The show was the December 8, 2008, episode of “On Point“ with Tom Ashbrook.

Poorvi Vora (CS): interviewed in October 2008 by WMAL, WAMU, The Washington Times, Voice of America (radio, broadcast, and Web), and Medill News Services for her voting research. (See page 20 for details).

Books

Louis Ippolito (ECE): wrote Satellite Communications Systems Engineering: Atmospheric Effects, Satellite Link Design and System Performance, which is published by John Wiley.


Joseph Pelton (ECE): co-authored Space Safety Standards and Regulation with Ram Jakhu. It will be published later this year by Elsevier. His book, License to Orbit: The Future of Commercial Spaceflight, was published by Apogee Book in early 2009.

Conference Keynote Lectures

Tarek El-Ghazawi (ECE): delivered the keynote lecture at the International Conference on New Technology, Mobility, and Security in November 2008, in Tangier, Morocco. He also served as the program chair for the International Conference on Field Programmable Technology held in December 2008, in Taipei, Taiwan.

Shelly Heller (CS): delivered “Online Learning 2.0” in February 2009, in Taipei, Taiwan.


Nicholas Kyriakopoulos (ECE): delivered “Quality of Service as a Measure of System Performance” in February 2009, in Vienna, Austria.


Joseph Pelton (ECE): chaired the opening keynote session of the International Association for the Advancement of Space Safety in October 2008, in Rome, Italy.

Inspiring Youth to Innovate

Aleksandar Stefanovski is trying to inspire youth in his native Macedonia to innovate and dream, but as he spreads the word about the program he has created, he is likely to inspire others as well.

“When I returned to Macedonia two years ago on a break, I noticed a sense of hopelessness among teenage kids due to the lack of jobs that will be available to them upon graduation,” he recalls. Being a doctoral student in computer science, he decided to conduct a survey to see if they knew how to use computers, and to his surprise, he found that 90 percent of those he surveyed use computers. He began thinking about ways to inspire them to dream, and he came up with the idea of creating Roboteka, an educational program to give talented youth between ages 10 and 16 the chance to get hands-on experience with robotics and computer science, and to expose them to science literacy and formal research methods.

“Roboteka includes a summer camp, extra-curricular workshop, teacher conference, and competitions,” Stefanovski explains. “The focus is on motivating and inspiring the youth to reach for their dreams, to be creative and artistically innovative, and to learn leadership and networking skills.”

Stefanovski has worked hard to build the program. He began in February 2008 by contacting foundations, the U.S. Agency for International Development (USAID) mission in Macedonia, the Macedonian Embassy in Washington, D.C., IEEE, and USFIRST, an organization that promotes students’ interest in science and technology. He was able to set up a fundraising event at the Macedonian Embassy; he got a $50,000 matching grant from USAID; and he is now trying to establish a regional Balkan robotics competition whose winners will be able to attend international competitions organized by USFIRST.

Stefanovski hopes to expand the program and is looking for help to do so. “As the program grows, we will work on expanding it internationally in other developing countries and make it more accessible to youth worldwide,” Stefanovski says. “We are in need of GW’s invaluable alumni help in spreading the word of Roboteka to their own countries. If you are interested in making a difference and in helping to create an international Roboteka summer camp network, please contact me at astefano@gmail.com or visit www.roboteka.mk.”

With a Purpose

Marcus Hendricks does not shy away from a challenge. In fact, he seems happy to have opportunities to test himself. Hendricks, a sophomore who recently declared his major in mechanical engineering with a medical preparation option, keeps a full roster of activities, works several hours each week on campus, and volunteers. And he keeps this schedule despite the demands of his engineering classes.

Hendricks is a member of the National Society of Black Engineers, the GW Canterbury Club (a Bible study), the GW chapters of both the Japanese Karate Association Club and the Close-Range Combat Group (a self-defense training group), and he works as a student assistant manager at the Smith Center. Until recently, he was in the Navy Reserve Officer Training Corps (ROTC), where he was a member of the Reveille choral group, the aviation club, the drill team, and a volunteer at several junior ROTC field meets. He also volunteers as an acolyte for Sunday worship services at St. Mary's Episcopal Church, across the street from campus.

Each of these activities has some purpose for Hendricks. When asked whether he has favorites among his activities, Hendricks replies, “Bible study is most important to me because it gives me the most direction for what I want to do in life. My job at the Smith Center gives me spending money, and I get to work with varsity athletes and sometimes do homework. Karate and the combat group are important because they allow me to defend myself or someone else.”

Hendricks has an unusually mature understanding of the purpose and challenges of his time in ROTC. He remarks, “I definitely enjoyed being in ROTC. What I learned the most was that there are some things that you have to change in yourself in order to be a better leader. The process of finding out your own personal flaws in character is not an easy road; it involves a lot of self-reflection.”

Although he spends a good deal of time on his extra-curricular activities, Hendricks makes a point to dedicate himself primarily to his studies. Here, too, he has a purpose in mind. “I’ve always had a profound interest in the sciences, especially space science,” he explains. “I wanted to apply that. I wasn’t always good at math and I still struggle with it, but I want to be able to go to work every day and enjoy what I do. I want a career in medicine and space exploration, and an engineering background will help me be able to do that. I would love my job and still be able to serve my country.”
Nguyen Receives NSF Fellowship

Linh Nguyen grew up in Vietnam and moved to the U.S. in 2000. Although she already had an undergraduate degree from a university in Vietnam, she enrolled at George Mason University to get a bachelor’s degree in civil engineering from an American university. Because of her command of the subject, she was able to work as a consultant at Edwards and Kelcey, a local engineering firm, while she worked on her degree. After finishing, she worked for a year as a structural engineer for the Federal Highway Administration, and then decided to enroll in graduate studies in GW’s Department of Civil and Environmental Engineering.

She began in a master’s program at SEAS, and was later admitted into the civil engineering doctoral program, where she works with her dissertation advisor, Professor Pedro Silva. She decided to apply for a National Science Foundation Graduate Research Fellowship award, and was delighted to learn last spring that she was among the seven percent of applicants across the U.S. who were selected to receive one of these prestigious fellowships. Says Nguyen, “More than 13,000 people applied last year and 970 received an award. I was so excited to receive the fellowship. At that time, I almost thought that I would give up and go back to work, because the economy was not so good and I have obligations. But the fellowship helped me, because I can stay in school and not have to worry so much.”

Nguyen’s fellowship supports her research project, which is part of a larger project that consists of a six-university research team led by the University of Nevada-Reno. Using the state-of-the-art shake table at GW’s Virginia Campus, she and Silva study the complex loading that can occur in bridge structures during near-field earthquakes. Nguyen explains, “My part is to look into the response of the reinforced concrete bridge under seismic load. Basically, we investigate how the bridge responds and evaluate the structure that is designed according to the proposed new design code. As a designer before, I know that we need to evaluate any proposed new code before we can implement it into new design standards. Part of my research is to evaluate the structure of our design according to the proposed new code requirements.”

Nguyen's research has received a good deal of attention. She has presented papers at both American Concrete Institute and Transportation Research Board conferences, and part of her papers will soon be published. She is understandably proud of her work, but also shares credit, saying, “Professor Silva and Professor Roddis have helped me tremendously. They’ve given me the chance to go to different conferences, and Professor Silva encourages me all the time. Without their help I wouldn’t be able to go this far.”

Study Abroad Ambassador

Matt Knouse knows something about learning to adjust to new situations. A senior with a double major in computer science and French, Knouse has already lived overseas twice as a study abroad student. His first study abroad experience was after high school, when he deferred his acceptance to GW and spent a year living in Maebashi, Japan. His second was his junior year at GW, which he spent studying in Aix-en-Provence, France.

As Knouse reflects back on how much he learned living abroad—as well as the fun and the struggles of trying to adjust to a new culture and language—he clearly could not be happier about having chosen to do so. He spoke no Japanese when he left for his year abroad there, and he laughs as he recalls the months before he was able to speak it. “Japanese is pretty difficult to learn, and I realized part way through the year that I was speaking neither Japanese nor English.”

France was a different sort of experience for him because he had studied the language for eight years and had already lived abroad. “Because of my previous experience, I knew that I had to suspend living as an American, so I was ready to slip into French culture. I already knew that speaking another language successfully is about translating ideas, not words, so that was my focus. It made the difference between being able to express humor and getting a puzzled look in return,” he says.

Knouse lived with a host family, made many French friends, and enjoyed the beauty of Aix-en-Provence, including living next to and hiking on a mountain that French impressionist Paul Cezanne painted. On top of this, he simply enjoyed the moments of realization that are part of studying abroad. “One of the best things about study abroad,” he remarks, “is that you can watch another culture at work and begin to recreate their perspective. You learn how to enjoy their life routines and not get hung up on the differences.”

With two study abroad experiences already under his belt, Knouse plans to lend his knowledge to efforts to increase SEAS students' participation in study abroad programs. Next fall, he will serve as the dean's fellow here at SEAS to help facilitate and organize more study abroad opportunities for SEAS students and to recruit students to the programs.
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The Luther Rice Society is named for the founder of Columbian College, now The George Washington University. In 1821, driven by President George Washington’s vision, Luther Rice lobbyed President James Madison and Congress to officially charter the institution and raised the $6,000 needed to purchase land for the Columbia College. Members of the Luther Rice Society carry on the tradition laid forth by George Washington and Luther Rice by helping GW raise its status as a world-class institution. Membership is extended to alumni and friends who make gifts of $1,000 or more between July 1 and June 30 of each fiscal year, and to recent graduates ($250 or more for alumni within 5 years of graduation; $500 or more for alumni 6-9 years after graduation).

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THE GEORGE WASHINGTON UNIVERSITY
A Note from Development

I recently came across a quote from a GW report entitled “Technology and the Modern University – A Report by The President’s Advisory Committee on Engineering and Applied Science.” It reads:

“Science and technology change our world. Each succeeding age produces new goals, new expectations and new accomplishments and, so too, science and engineering grow and develop with time. The scientist and engineer of today bear little resemblance to their predecessors of a past age, and their successors will be different. The problem which the engineering educator faces is to anticipate what skills and goals will be required of future engineers and to educate them to meet their future.”

Interesting enough, that report was issued in 1966. What struck me about it is its relevance for today, particularly as we consider interdisciplinary programs at SEAS such as biomedical engineering, cyber security, transportation safety, and our research in energy-related fields, just to name a few. I am convinced that many of tomorrow’s solutions for today’s problems will be achieved through the collaborative efforts we are building at SEAS and GW.

Perhaps the most visible evidence of these efforts on campus will be our new science and engineering complex. Currently in the planning stage, the facility will house the School of Engineering and Applied Science and also some of the natural and life science programs with which SEAS collaborates. It will be an excellent centerpiece of GW’s growing commitment and leadership in state-of-the-art research and discovery in engineering and sciences.

**Be a part of it. . .**

As this issue of Synergy makes clear, 2009 marks 125 years of engineering at GW. During this time, the School of Engineering and Applied Science has achieved success through the efforts of visionary leaders, dedicated scholars, intellectually curious and ambitious students, and generous alumni and friends.

Today, SEAS is embracing the opportunity to be a 21st century global leader in charting solutions. We are doing that by pushing the boundaries of progress on unprecedented engineering problems and challenges. Dean Dolling is leading the charge. The stake is in the ground. And we invite you to be a part of it!

As in the past, the future of SEAS will be girded and strengthened by the support and engagement of alumni and friends. Our development staff eagerly anticipates meeting with you in the coming months to discuss and offer opportunities for your participation. In the meantime, our doors are open in Tompkins Hall and we welcome a chance to visit with you—or to hear from you via phone or e-mail.

Finally, since I arrived at GW and SEAS just this past December and have not yet had the chance to meet most of you, I’d like to introduce myself. I came to SEAS from Oberlin College in Ohio, where I worked for the previous nine years. At Oberlin, I served as director of principal gifts and cultivated philanthropic support to build a $65 million science center and a recently-completed $22 million jazz facility.

I also previously served as director of alumni relations and annual giving at Cardigan Mountain School in New Hampshire, and spent the first 15 years of my career in commercial and consumer banking in New Hampshire, where I held senior positions in lending, management, and business development. I hold a bachelor’s degree and a master’s degree in business from the University of New Hampshire. My wife Ann and I have three grown children living in Ohio and Massachusetts.

Thank you for your interest in and support of SEAS, and stay tuned for great things to come!

With best regards,

Jim Howard
Assistant Vice President
Development and Alumni Relations
jphoward@gwu.edu
Tel: 202-994-4121
News

Scott Amey and Julie Lee Receive Alumni Achievement Awards

GW honored seven alumni with achievement awards last September, and two of the honorees are SEAS alumni. Scott Amey (MS ’75) was presented with the Distinguished Alumni Achievement Award, and Julie Lee (MS ’05) with the Recent Alumni Achievement Award. Both awards recognize GW alumni who have attained notable achievements in their field.

The Distinguished Alumni Achievement Award—the highest honor bestowed by the university on its alumni—was presented to Scott Amey for his success on several fronts. Amey co-founded RS Information Systems (RSIS), a company that provides advanced technical and business solutions in information technology, systems engineering, and other areas to the defense, civilian, and law enforcement agencies of the federal government. Before he retired in 2004, he helped grow the company to 1,700 employees, and in 2005, the company was ranked 35th on the Washington Technology list of the largest federal technology services contractors.

After his retirement, Scott served for roughly three years as the volunteer director of the SEAS Career Services Office, dedicating three days a week to helping SEAS students start their careers. He was also very active in helping Georgetown’s Lombardi Cancer Center, where his daughter had been successfully treated.

Scott subsequently started another company, Amyx Inc., which has already grown to 70 employees and which he leads as its president and chief executive officer.

Julie Lee received the Recent Alumni Achievement Award, which is presented to alumni who have graduated in the last five years. Lee is the president and chief executive officer of Access Systems, Inc., which provides IT services to the federal government and has been recognized by the Virginia Chamber of Commerce as one of Virginia’s fastest growing companies (2004-2008). It has also been recognized by Inside Business magazine as one of the best places to work in the state, and named among Washington Technology’s “Fast 50” for seven years in a row (2002-2008).

From 1998-1999, Julie served as president and chief executive officer of ATECH Corporation. Julie is an active member of numerous industry organizations, most notably as a member of the Director’s Advisory Council on Women’s Business of the Virginia Department of Business Assistance, an organization to which she was appointed in 2003 by then-Governor Mark Warner. In 2006, she received the Entrepreneur of the Year Award from the Small Business Administration in the D.C. area. She was named one of Fifty Most Influential Minorities in Business by the Minority Business and Professional Network in 2002 and 2004, as well as a Minority Small Business Advocate by the Asian American Business Roundtable in 2004. Julie is active in a number of local and national volunteer organizations, and she is currently pursuing her doctoral degree in engineering management here at SEAS.

Asghar Mostafa Receives GW Award for Distinguished Entrepreneurial Achievement

In October, GW honored SEAS alumnus Asghar Mostafa (BS ’81, MS ’82) with the 2008 Distinguished Entrepreneurial Achievement Award at a reception at the Fairmont Hotel. The award for distinguished entrepreneurial achievement was created in 2007 as part of the annual GW Entrepreneurs Roundtable event to honor an entrepreneur who has displayed outstanding innovation, vision, integrity, leadership, and social responsibility in developing and bringing to market a novel technology, product, or solution.

GW President Steven Knapp presented the award to Mostafa during the event, which also included the GW Business Plan Competition (sponsored by Annette and Richard Scott), a panel discussion with GW alumni entrepreneurs, and a networking reception.

An experienced entrepreneur with an extensive business and technical background, Mostafa has spent more than 25 years creating and building category-breaking technology companies.
He recently launched Entourage Systems, Inc., a technology platform company that seeks to break the cost and technology barriers in education to bring affordable, upgradeable textbooks and content to students. Prior to that, Mostafa founded Vinci Systems, which designed, manufactured, and sold interoperable broadband optical network terminals (ONTs). After two years of operation, the company was purchased by Tellabs Inc., and to date, more than two million of these ONTs have been sold to Verizon for its FiOS network.

In 1997, Mostafa founded Advanced Switching Communications, Inc. (ASC) to develop and bring to market lower cost, highly flexible broadband access solutions. ASC completed its initial public stock offering in 2000 and successfully raised close to $200 million. Before that, Mostafa founded ISDN Systems Corporation (ISC), a leading provider of integrated services digital network and frame relay equipment. He served as president and CEO of ISC until 1995, when U.S. Robotics, now part of 3Com, acquired the company. Earlier in his career, Mostafa was vice president of product development for the telecommunications division of Data General Telecommunication Division, and he co-founded and served as vice president of engineering for ICOM, an early entrant in the field of fixed-wireless communications and a developer of T-1 multiplexers.

Mostafa is a long-standing member of the IEEE and the Association for Computing Machinery (ACM), and has served on the board of directors of several networking and communications companies. He currently serves on the board of directors of Entourage Systems, Inc.; LTI DataComm; Mostafa Venture Fund, LLC; and the SEAS National Advisory Council.

Upcoming Alumni Events
Stay connected with SEAS alumni, faculty, and current students by attending our many fall 2009 SEAS alumni events listed below. Be sure to visit the online alumni events calendar at www.alumni.gwu.edu/calendar for more detailed information. You can also find a complete listing of alumni events and programs in the Colonial Cable, the e-newsletter sent monthly to all GW alumni. If you do not currently receive the Colonial Cable, you can sign up at www.alumni.gwu.edu/news.

Fall 2009
Frank Howard Distinguished Lecture Series Washington, D.C.
Alumni Receptions with Dean Dolling Boston, NYC, and Philadelphia regions
Student Alumni Networking Event Washington, D.C.
SEAS Alumni Social Event Washington, D.C.

Engineer Alumni Association, Call for Volunteers
Volunteer for our newly structured EAA. We are building new and dynamic alumni programming at SEAS, and we need alumni volunteers who can provide direction and feedback to the Office of Alumni Relations and SEAS to help build alumni engagement with a focus on alumni programs, student/alumni programs, and recruitment and outreach.

We are asking volunteers to commit to a year of service, during which you will assist in planning SEAS alumni programs, attend three meetings, participate on at least one of the focus area committees, and attend at least two SEAS alumni events.

If you are interested in participating in this integral part of programming for SEAS alumni, please contact:
Erin Pitts
Associate Director
School Alumni Programs
Alumni House @ 1918 F Street, NW
Phone: (202) 994-2355
espitts@gwu.edu

Other Alumni Volunteer Opportunities
There are many ways alumni can be involved at GW and at SEAS. Below are some wonderful volunteer opportunities available at the university. Visit http://alumni.gwu.edu/support/getinvolved.html or contact Erin Pitts at espitts@gwu.edu or (202) 994-2355 to find more information on all of these opportunities.

Be a Career Advisor
Share insights with other graduates and current students seeking career assistance. Register to be a career advisor at www.alumni.gwu.edu/networking.

Connect with Students
From hosting a dinner with students to delivering a guest lecture, you have a lot to offer. Participate in a student-alumni program to build connections with current students.

Apply for the GW Alumni Association Board
The GW Alumni Association works collaboratively with the university to implement programs and services that benefit GW alumni. Board elections take place in the spring of each year.

Get Involved with the Young Alumni Network
The Young Alumni Network (YAN) sponsors programming and provides benefits designed to meet the social, networking, and educational needs and interests of graduates from the past 10 years. Join the dedicated recent graduates who provide the inspiration for YAN activities!
Karlgaards Establish Scholarship Fund
To help make a GW education accessible to more students, President Knapp and the University’s Board of Trustees recently created an initiative to make student aid a GW priority.

Last December, David Karlgaard (D.Sc. ’74) and his wife Marilyn answered this call by establishing the Karlgaard Scholarship for undergraduate students in computer science. “You go through a stage in life where you want to give back,” says Karlgaard, current chair of the SEAS National Advisory Council.

Intended to recognize outstanding academic performance, the Karlgaard Scholarship will be awarded to qualifying students entering their junior or senior years who have attained a GPA of 3.0 or higher, and who are U.S. citizens.

Explaining the couple’s motivation, Karlgaard remarks that GW was highly influential in his own professional career and ongoing success. “We wanted to help other people have that same success opportunity,” Karlgaard says. “We also hope in some small way that this scholarship, in conjunction with other things people do for the school, will help lead to the enhanced reputation that SEAS is trying to achieve.”

Ian Balina, who moved to the United States from Uganda when he was in the fourth grade, had big dreams but little means to pursue them. That all changed when he came to GW, thanks to scholarship support.

“I was thrilled to be accepted into the School of Engineering and Applied Science. My experience here has been so special. I love the small classes and the opportunity to meet and talk with faculty, who encouraged me to pursue my dreams to start my own business and seek an advanced degree.”

— Ian Balina, SEAS ’10
Computer Engineering Major
Co-founder, Leximo, an online dictionary business

Help transform the lives of people like Ian and be part of the SEAS tradition of philanthropy by making a contribution to a SEAS scholarship fund!

To learn more about ways you can make a difference, please contact:

SEAS Office of Development
210 Tompkins Hall • 202-994-4121
Happenings

Ali Ahmadi, MS '83, will finish his doctoral program this May in computer science. He has moved to Seattle and started to work for Microsoft in the Office team.

Saad AlAjlan, MS (electrical engineering) '08, joined Ericsson AB, Saudi Arabia branch, after graduating. He now works as a solution manager for radio access network. He credits his GW education with giving him the edge over his competitors in winning his position and he thanks the GW family for all the support and help that he received here.

Ibrahim Al-soqabi, BS (civil engineering) '75, and his wife were blessed earlier this year with a baby boy named Abdulrahman.

Vittal Anantatmula, D.Sc. (engineering management) '95, is an associate professor in the College of Business at Western Carolina University. [http://paws.wcu.edu/vittal](http://paws.wcu.edu/vittal)

Walid Choueiri, MS (civil engineering) '05, works at SK&A Structural Engineers in Rockville, MD, where he has been since finishing his bachelor’s degree. He was recently promoted to associate at the firm and will be getting married on August 8, 2009.

Osama Mohamed El-Ghandour, D.Sc. (electrical engineering) '90, is a professor teaching at Helwan University in Cairo, Egypt. His work is in the field of mobile communications.

David Fiala, MS (mechanical engineering) '03, welcomed the birth of his son Jack and was promoted to a management position as a marine engineer. He works for the Overseas Shipholding Group as a first assistant engineer on the tanker Overseas Houston. Jack joins his siblings, Morgan (3 yrs) and Emma (1 1/2 yrs), who are looked after by David’s wonderful wife Aimee while David is at sea.

Ankur Gupta, MS (computer science) '07, really enjoyed his experience at GW. He has recently been promoted to senior business analyst at TMI Solutions and is working in the IT strategic planning consulting practice.

Somak Haider, MS (computer engineering) '03, works as a senior data analyst at Capital One Financial in Richmond, VA.

Martin Kamara, MS (mechanical engineering) '96, is a chief warrant officer in the Active Component of the United States Army Reserve. He serves with the United States Army 345th Combat Support Hospital at Al Asad Airbase, Iraq, and expected to be home from Iraq in April 2009.

Mai Kanaan, MS (computer science) '06, works as an instructor at An-Najah National University, Nablus, Palestine.

Clif Kranish, MS (computer science) '82, is a director of product management at Information Builders.

Tiffani (Warren) Langdon, BS (electrical engineering) '95, works at Pepco in Washington, D.C., as a lead engineer. Tiffani and her husband Marion and their son Marcel welcomed Mason into the world on September 11, 2008. Tiffani also has accepted a new position to be the Pepco engineering liaison to Prince George’s County for system and highway projects.

William Lohnes, MEA '69, has joined the Board of PrismTech Solutions Americas as an outside director.

Lyle Long, D.Sc. (aerospace engineering) '83, is a distinguished professor of
Sandy Joel Marenberg, BS (civil engineering) ’69, is the president of Marenberg Enterprises and received the 2008 Developer of the Year award from the Homebuilders Association of Maryland.

Homayoun “Al” Mirfakhrai, BS (civil engineering) ’80 and MEM ’96, has worked for the past twenty years for NASA as a project manager/COTR, managing various engineering and construction projects. He writes, “I was the chairman of a public relations committee and Congressional Liaison, and I played a key role in passing a civil rights bill by advancing it in the U.S. Senate in 1999.”

Uchchash “Steve” Mukherjee, MEM ’79, works for the U.S. firm AECOM and has been assigned as a program cost manager to an multi-billion-dollar project for the Housing Infrastructure Board of Libya.

Nghi Thanh Nguyen, D.Sc. (civil engineering) ’06, works as vice-rector of Ho Chi Minh City University of Architecture in Vietnam.

Hua Ni’s, D.Sc. (operations research) ’04, third daughter, Hanna L. Ni, was born on February 21, 2009. She weighed 7 lbs., 8 oz. and was 18 3/4 inches long at birth.

Kristy McDonnell Ortiz, BS (civil engineering) ’99, MEM ’01, and her husband, Daniel Ortiz (Law ’02), are pleased to announce the birth of their son, Adam Owen Ortiz. He was born on August 25, 2008, and weighed 6 lbs., 11 oz. “Adam has been a wonderful addition to our family and we couldn’t be happier,” says Ortiz.

Jesus Rohena, MS (civil engineering) ’95, has been promoted to senior tunnel engineer at the Federal Highway Administration. He is leading the effort to establish a new program for the inspection of highway tunnels in the U.S.

Jon A. Schmidt, BS ’92, MS ’94 (civil engineering), is an associate structural engineer and the director of antiterrorism services at Burns & McDonnell in Kansas City, MO. Schmidt received the 2008 Distinguished Service Award from the National Council of Structural Engineers Association (NCSEA), is an active member of two NCSEA committees, and chairs the editorial board for the organization’s magazine, STRUCTURE. Schmidt was also named in the January 2009 issue of *Building Design+Construction* as one of the top young professionals in the industry as part of that publication’s annual “40 Under 40” recognition program.

Ben Schupak, MS (computer science) ’03, works for Ernst & Young in New York City. He builds web sites and databases that support back-office operations involving the 140,000 employees. He is in the second semester of the part-time MBA program at Rutgers University Business School.
Jae Shin, MS (electrical engineering) ’08, works for the Federal Aviation Administration as an electronics engineer in the spectrum engineering office. He was recently promoted and is involved in many exciting spectrum issues.

Lt. Comdr. Dan Somma, MEM ’08, was selected to serve on the Department of Homeland Security Integrated Process Team for cargo security. The group’s work was recently featured on the show “High Tech War on Terror” on the National Geographic Channel. Dan is currently stationed at Coast Guard Headquarters in the Office of Ports and Facilities Activities. He works to align maritime cargo security initiatives between the Coast Guard and other federal agencies.

Murray Stein, BS (electrical engineering) ’49, writes, “While I had a distinguished career in engineering, culminating with teaching for 26 years in GW’s Continuing Engineering Education Program, I have developed a new career in sculpture. In 1999 the Path of Achievement Award designated me a “Living Treasure” in Maryland, followed by two lectures at the Smithsonian’s Renwick Gallery, several museum exhibits, and numerous top prizes in competition, including First Place in the 2008 Texas Sculpture Association Show. My 1000s of hours of community volunteerism at senior centers and teaching art to disadvantaged elementary school children won me the 2006 National Distinguished Senior Award on Capitol Hill by NCPSSM, plus a Public Service Award by the D.A.R. in Texas.”

Oldemar Tello, BS (electrical engineering) ’84, is currently employed as a certified technical quality manager at SAP Government Support and Services.


Yakov Vorobyev, BA (computer science) ’05, is president of Mixed In Key, a software company that develops software for musicians and DJs. Mixed In Key has been nominated for the “Best New Product of the Year” by the International Dance Music Awards in Miami, and was chosen as Microsoft’s “Most promising start-up of the week.” It also won the “Best DJ Tool” award from DJ Magazine in 2008, and was nominated for its “Most Innovative Product” award in 2007. http://www.MixedInKey.com

Sean Walsh, BS (mechanical engineering) ’76, writes, “After a career as a Navy engineering duty officer, I have been working in private industry for several years and am currently employed by Alion Science and Technology in the JJMA Maritime & Industrial Engineering Group. Recently I have been assigned as the deputy program manager for the NAVSEA 05 Ship Design Services contract. I’ve also been active as an alumnus, serving as a science fair judge for the GW Engineer Alumni Association, hosting a dinner with alumni for SEAS students, speaking to the student chapter of ASME at SEAS, and arranging for a SEAS professor to speak at a local section dinner of the Society of Naval Architects and Marine Engineers.”
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