



THE MAGAZINE OF THE A. JAMES CLARK SCHOOL *of* ENGINEERING

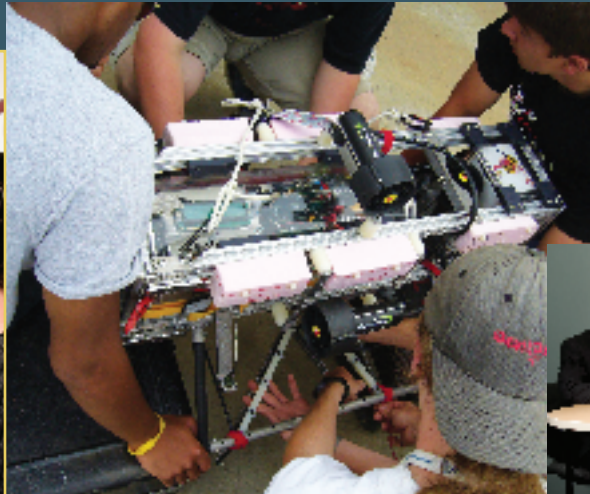
# For the Greater Good

Dean Darryll Pines  
Leads the Clark School  
To Make A Difference

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Helping Clark School  
Students Succeed

New Team Drives to  
Complete Historic  
Campaign Goal



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Cover photo by Mike Morgan

## Dear Friends,

This is a call to action.

Today—right now—we have an important opportunity at the Clark School of Engineering.

The world is undergoing enormous economic, political and social change. If we can come forward with new technologies, new engineers, new enterprises and new service programs, and put them to use in crucial areas like health care, water management, energy, telecommunications and national security, we will take on a new role in engineering, here and around the world:

*We will be leaders.*

Notice that I said “We.” All of us—alumni, students, staff, faculty, corporate and government partners, members of our Board of Visitors—must be involved. Here’s what you need to do:

1 Learn about the Clark School and its programs. You can join in our work—and share it with others—only if you know what that work is. Read this magazine, our web site and e-newsletters. Call or e-mail a former teacher or fellow alum. Find out what’s happening. You’ll be amazed.

**“The more partners  
we have, the greater  
impact we have.”**



2 Make connections between our work and what’s important to you. Depending on your interests and abilities, we can find ways to involve you in our lab and field research, our teaching, mentoring and recruiting, our company-building, and our service to communities. Bring us your ideas and we’ll find a way that makes sense for you.

3 Make connections between our work and your world. Look for ways to link the Clark School with people and organizations that care about improving the world through new technology and ideas. The more partners we have, the greater impact we have.

Will your participation take some of your valuable time? Yes. Will it be worth it when you see that our school is making the world a better place? Absolutely.

Join us.

Darryll Pines  
Dean and Nariman Farvardin Professor  
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www.eng.umd.edu

# Clark School to Lead New Electromagnetics Center



Patrick O'Shea

The university recently established a new multi-million dollar Center for Applied Electromagnetics—AppEI—with significant funding from the Office of Naval Research. AppEI will be “the focal point for basic research that may lead to significant improvements and valuable new concepts in future Navy and Department of Defense systems,” says Patrick O'Shea, chair of the Clark School's Department of Electrical and Computer Engineering (ECE).

The idea for the center took root after Rear Admiral

William E. “Bill” Landay III, chief of naval research, spoke at a university-sponsored seminar last year. He commented about “the Navy's interest in dominating the electromagnetic spectrum and fighting at the speed of light,” recalls O'Shea. “The admiral's vision intersected with the concept I had in mind.”

The center has three goals: perform basic research in applied electromagnetics, train students in applied electromagnetics, and oversee basic research translated to practical applications through collabora-

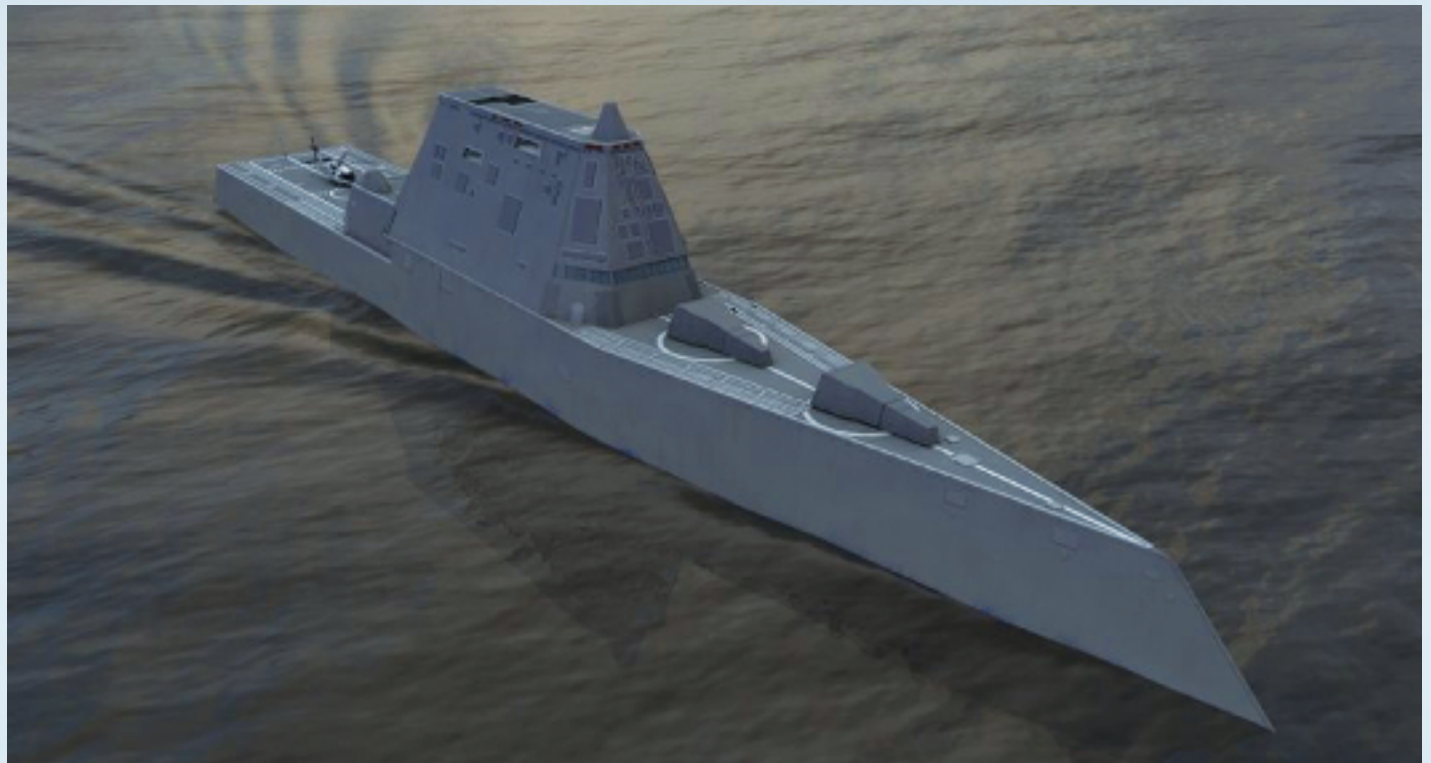
tions with government and industry. The university's unique expertise and long-term record of excellence in applied electromagnetics research and education is a critical component in achieving those goals, O'Shea notes.

The research “will emphasize electromagnetic phenomena in the spectral range from microwaves to visible light,” he adds. More specifically, engineering and physics studies will form the basis of all-electric ships, speed-of-light weapons, protection of electronics from high-power microwave attack and advanced communication technologies of the Navy.

ECE Professor Victor Granatstein will direct the research of the center, which will include approximately 19 faculty researchers from seven academic departments and research institutes across campus, including ECE, physics, materials science and engineering, aerospace engineering, the Institute for Research in Electronics and Applied Physics, the Institute for Physical Science and Technology, the Institute for Systems Research and the Institute for Advanced Computer Studies. The center will also work with other institutions, including the Naval Postgraduate School and Boise State University.

“Consolidating the research activities of several departments will increase our visibility as the leading center for applied electromagnetics,” O'Shea says. “That means we can better serve the research and educational needs of our current sponsors and attract additional sponsors and research partners from other universities, industries and national laboratories.” ■

**AppEI's research will form the basis for all-electric ships, speed-of-light weapons and advanced communication technologies that the Navy anticipates deploying.**





# Getting the Lead Out

## Lead-free Electronics Could Reduce Pollution

A new lead-free material discovered by researchers at the Clark School could replace a common, lead-based material found in many electronic devices, and reduce the amount of lead from electronics put in landfills and the ecosystem.

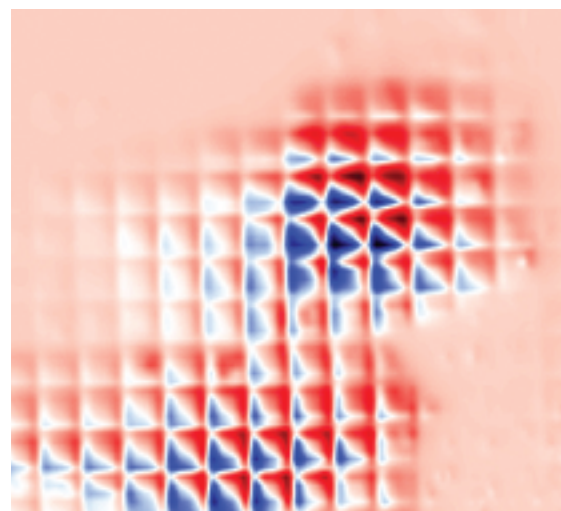
Ichiro Takeuchi, associate professor of materials science and engineering, and his collaborators at the university's Keck Laboratory for Combinatorial Nanosynthesis and Multiscale Characterization, have discovered a new compound of bismuth samarium ferrite (BSFO) that can serve as a replacement for lead zirconate titanate (PZT). PZT is the material of choice for transducers, actuators, sensors and microelectromechanical systems used in applications as varied as biomedical imaging devices, airbag sensors and inkjet printers.

Behind the discovery of the BSFO compound is a relatively new technique—combinatorial materials synthesis or “combi”—which allows researchers to rapidly screen large numbers of candidate materials for desired characteristics, saving time and money. According to Takeuchi, only a handful of laboratories in the world possess this capability.

Takeuchi starts with puck-like pieces of ingredients – bismuth ferrite and samarium ferrite. A precisely controlled laser blasts away molecular-size pieces of each puck, which are then deposited in thin films on a chip. Each film contains varying proportions of the original ingredients. Multiple layers of the films combine to form continuously varying formulae for new materials with new properties, each one slightly different than the next. A collection of these tiny samples housed on a chip is known as a combinatorial library.

“You’re looking for that perfect combination with the best properties,” Takeuchi explains. “It’s like baking cookies. In combi, you’re baking a huge number of individual cookies, each with its own recipe, at the same time on the same sheet. We were looking for something that had piezoelectric properties as good as or better than PZTs.”

Takeuchi’s group found that enhanced piezoelectric properties always formed when atomic-scale structures were on the verge of changing from one crystal structure to another, a state known as phase boundary. “The ability to snap between two phases based on



An example of a combinatorial library chip, part of a magnetic smart materials library.

external stimulus makes our BSFO compound perfect for use in switches or actuators in electronic devices,” says Takeuchi. “The fact that our version is as responsive as its lead-based counterpart is a huge bonus.”

The combi technique has shaved years off the research process for Takeuchi’s group, but more work remains to be done. “Products that use the new compound could hit the market in about five years,” he says. “Now that we’ve discovered it, the next steps are testing it in large samples, drumming up industry interest and working out mass production.” ■

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## Sustainable Energy Engineering Degree Meets Growing Demand

The Clark School has developed a new master of engineering program that will help meet the emerging demand for sustainable energy engineers worldwide. Developed by faculty in mechanical, nuclear, reliability, chemical, biomolecular and systems engineering, the new Master of Engineering in Sustainable Energy Engineering will be offered in fall 2009 both on campus and online through the school’s Office of Advanced Engineering Education.

“The interest in sustainable energy engineering education locally, and the lack of an equivalent option at other top engineering schools, make it vitally important to offer the graduate program online nationally and internationally,”

says Paul Easterling, director of educational development and communications in the Office of Advanced Engineering



Education. “Well-trained sustainable energy engineers are in high demand. Graduates can expect to find employment in a growing number of positions within the public and private sectors.”

The curriculum covers topics in renewable energy applications, energy conversion for stationary and mobile applications, environ-

mental risk analysis, advanced fuel cells and batteries, and photovoltaics (solar energy). Students can customize their studies by selecting from three sets of electives: nuclear engineering, energy

systems or reliability engineering.

Drawing upon the Clark School’s strengths in energy engineering research through the University of Maryland Energy Research Center, the new program provides an immersive and collaborative learning environment that enables candidates from around the world to share experiences and know-how while staying in touch with the school’s expert faculty.

“This program comes as practicing engineers are needed in the rapidly developing field of sustainable energy engineering,” says Stephen Treado, adjunct faculty and associate coordinator, White House Council on Environmental Quality. “The online program allows engineers the opportunity to supplement and develop their current knowledge through a multidisciplinary curriculum without ever needing to step foot on campus.” ■

## Two Departments Celebrate Milestone Anniversaries

### ECE Centennial Weekend

The Clark School's Department of Electrical and Computer Engineering (ECE) marked its 100th anniversary with a special weekend of events in September. More than 350 alumni, students, faculty, corporate partners and friends of the university registered for ECE Centennial Weekend. Highlights included an alumni reception and a pair of daytime forum events featuring experts from across the country who spoke about "The Future of Information Systems and Communications" and "The Future of Energy." University System of Maryland Chancellor Brit Kirwan spoke at the Centennial Luncheon, and Senior Vice President for Academic Affairs and Provost Nariman Farvardin moderated a forum event.

A gala event on Saturday evening included a keynote presentation by Dean Kamen, who discussed the importance of K-12 science and technology education. Kamen, inventor of the Segway Transport, is the founder of DEKA Research and FIRST (For Inspiration and Recognition of Science and Technology), an organization dedicated to motivating the next generation to understand, use and enjoy science and technology.

ECE Centennial Weekend was sponsored

**Robotics@Maryland** students show off their award-winning autonomous underwater robot, *Tortuga II*, for ECE Centennial Weekend guests outside the Jeong H. Kim Engineering Building. (See related story, p. 20.)



**CEE Centennial Medal winners with the Centennial Committee members. Back row, from left: Committee members Gerald Galloway, Sangeeta Kaul, Richard McCuen, CEE Chair Ali Haghani and Gregory Baecher. Back row, far right: Doug Hansford. Bottom row, from left: Medal winners Richard Reed and Dan Garber, Gala Guest Speaker General Robert Van Antwerp, medal winners Mariko Wright, A. James Clark, C. Rebecca Chavarria, James Colville, Margaret Keimig, Dave Mongan, Neil Pedersen, Charles Irish Sr., Raymond Krizek and Robert Ragan.**

by Qualcomm, Texas Instruments, Booz Allen Hamilton, Lockheed Martin, Thales Communications and Sun Microsystems. Video footage from the two Centennial Forum events, as well as photos from ECE Centennial Weekend, are available online at [www.ece.umd.edu/centennial/](http://www.ece.umd.edu/centennial/).

### CEE Anniversary Activities

Two of the oldest graduates of Civil and Environmental Engineering (CEE) at the Clark School, Stan Lore, B.S. '34, and Philip Cooper, B.S. '31, were among those joining the department for its centennial celebration last spring.

The activities began with a symposium followed by a formal reception and Centennial Gala attended by some 200 alumni, students, faculty, staff and corporate friends. General Robert Van Antwerp, commander of the U.S. Army Corp of Engineers, spoke on "Maintaining America's Infrastructure" at the gala, where 14 members of the CEE family were honored with specially designed Centennial Medals.

"The Future of Civil Engineering" symposium featured guest speakers Donald Boesch, president of the university's Center for Environmental Studies; Richard Lawrie of Lawrie and Associates; David Mongan, B.S. '72, and president of the American Society of Civil Engineers; Priscilla Nelson, provost of the New Jersey Institute of Technology; John Porcari, secretary of the Maryland Department of Transportation; and CEE's own Lewis "Ed" Link, director of the Katrina Interagency Performance Evaluation Task Force.

The CEE Anniversary Weekend was supported by A. James Clark, B.S. '50, chairman and chief executive officer of Clark Enterprises, Inc., and corporate partners including Whiting-Turner; Clark Construction; Whitney, Bailey, Cox and Magnani; Forrester Construction; Greenhorne & O'Mara; Vika; and Sigma Engineering. For more information on the CEE anniversary festivities and a limited edition CEE Centennial book, see [www.civil.umd.edu/centennial/](http://www.civil.umd.edu/centennial/). ■

PHOTO BY KEITH MOSHER

PHOTO BY AL SANTOS



## Clark School Welcomes New Faculty Members



**SILVIA MURO** received her Ph.D. in molecular biology from the Autonomous University of Madrid, Spain. She had an extensive career in medical and biomolecular research before joining the Clark School's Fischell Department of Bioengineering, including postdoctoral appointments and fellowships in Canada, Denmark, Spain and the United States, most recently at the

University of Pennsylvania School of Medicine. She currently focuses on designing nano-scale therapeutics to optimize drug delivery to precise disease sites at the sub-cellular level, increasing effectiveness while minimizing side effects. She holds a joint appointment with the University of Maryland Biotechnology Institute (UMBI).

"UMBI and the Fischell Department of Bioengineering represent ideal environments for the development of my research interests, providing me with a unique opportunity to incorporate more biotechnological and engineering approaches to my program," Muro says.



**IAN WHITE** received his Ph.D. in electrical engineering from Stanford University. Before joining the Fischell Department of Bioengineering, he was a photonic test engineer for Onetta, Inc., a developer and manufacturer of optical modules and subsystems for optical network equipment, and he was a principal technical staff member focusing on optical transmission at Sprint

Advanced Technology Labs. He also held a postdoctoral fellowship in the Department of Biological Engineering at the University of Missouri-Columbia, where he developed sensing platforms based on photonics and nanotechnology. Currently, he is creating biosensing tools for the study and analysis of disease at the molecular level. His goal is to integrate photonic technologies into lab-on-a-chip platforms for high-throughput, low-cost biomolecular analysis.

"I am extremely excited to join the Clark School," White says, "because of the number of potential collaborations in areas such as biosensing, microfluidics and device integration."



**LEI ZHANG**, who earned his Ph.D. in civil engineering from the University of Minnesota at Twin Cities, has joined the Clark School's Department of Civil and Environmental Engineering. He conducts both advanced and applied research on the dynamics of transportation and urban systems, as well as their implications for management and policy decisions.

He leads the Clark School's Sustainable Transportation Analysis and Research (STAR) group, which promotes and employs interdisciplinary approaches to modeling the interdependencies between transportation, land use and economic systems. His studies have been published in more than 50 journal and conference papers.

"My research at the Clark School focuses on the development and application of various technological, management and policy tools that improve efficiency, equity and sustainability of our transportation systems," says Zhang.



**QINGBIN CUI**, also new in the Department of Civil and Environmental Engineering, was previously an assistant professor of civil engineering at the University of Alabama and served as a research assistant at Purdue University, where he received his Ph.D. in civil engineering. In his homeland of China, Cui was a consultant for China Fortune Investment, providing project

feasibility analysis. He previously worked for the China Petroleum and Chemical Corporation as a project manager, engineering team leader and site engineer, and served as an estimator in the Kaifeng-Luoyang Expressway Project funded by the World Bank. Many of his research projects have focused on road safety, and his recent studies examine project delivery, alternative financing, front-end planning and contract engineering.

"I am most interested in infrastructure management and delivery systems for all types of transportation," explains Cui.

### Young Faculty Members Garner Prestigious NSF Awards

Four Clark School faculty members have received National Science Foundation Early Career Development (CAREER) Awards, and another faculty member was named a Presidential Early Career Award for Scientists and Engineers (PECASE) winner. The honors are among the most prestigious for young faculty members.

**ANDRÉ MARSHALL**, associate professor of fire protection engineering and aerospace engineering and director of the Fire Testing and Evaluation Center, received a PECASE award for his work in jet fragmentation and atomization for combustion and fire suppression systems.

#### CAREER Award Winners

Fischell Department of Bioengineering Assistant Professor **ADAM HSIEH** for using cellular engineering to customize mechano-transduction—the way that cells perceive and respond to mechanical stress.

**RAY SEDWICK**, assistant professor of aerospace engineering, for his research into helicon radio-frequency plasma generation for propulsion and semi-conductor manufacturing. Sedwick is an expert in space power and propulsion.



**SANTIAGO SOLARES**, assistant professor of mechanical engineering, for his project to increase the use of atomic force microscopy in studying fragile biological specimens in aqueous environments.

Electrical and Computer Engineering Assistant Professor **EDO WAKS** for his work using photonic crystal structures to modify and enhance quantum dots (QD) properties, allowing coherent interactions between a QD and a photon field. Such interactions are essential elements of photonic quantum information processing.



# For the Greater Good

6

## Dean Darryll Pines Leads the Clark School To Make A Difference

**D**arryll Pines, the new dean of the A. James Clark School of Engineering, is both a fierce individual competitor and a dedicated team player. Balancing those two characteristics has brought him, and the organizations he has served and led, great success. He is now working to create such a balance at the Clark School.

“Many of us at the Clark School are driven to excel, to achieve at a higher level than our colleagues here and elsewhere,” he explains. “And we succeed. Our students, faculty and alumni are well known and successful competitors for national and international awards and positions of leadership, as this magazine shows. We will always continue to do so. But we must balance our individual pursuits with contributions to the greater good—to our units and our school—so that these, too, can rise to the top.”

Pines sees achieving this balance as a goal for everyone, from students, faculty and staff to alumni and corporate partners. “An

important part of my job is to inspire everyone associated with the school to do one thing, every day, for the greater good. It might be offering to assist a colleague in another department; or taking a moment, in a presentation about your own research, to talk about someone else’s exciting advance. It might mean working on a strategic plan committee or as a mentor to a student group. Or taking time to serve at a government agency. These efforts will make the whole greater than the sum of its parts. That’s how we will complete our ascent into the top ranks of the nation’s engineering schools, and ensure that we contribute, at our full capacity, to progress in the world.”

### Change Means Opportunity

Contributing to progress is a primary objective. Pines wants to focus the school’s immense expertise and energies on a small number of major opportunities that he believes hold the greatest chances for the

school to make significant contributions.

“This is a time of great change, and that means opportunity,” he states. “The Clark School has four capabilities: engineering research, education, entrepreneurship and service. We need to focus those capabilities on specific areas—our faculty cite healthcare, water management, sustainable energy, telecommunications and national security as major impact opportunities for us, with nanotechnology as a special expertise. By doing so we can create powerful new technologies, bright young engineers to apply those technologies in their own start-up companies, and service programs through which our students can take our ideas and skills to people around the state, the country and the world. Our sphere of impact can and must be that big.”

### Many Ways to Make an Impact

From 2003 to 2006, during a leave of absence from the university, Pines served



as a program manager for the Tactical Technology Office and Defense Sciences Office of DARPA (Defense Advanced Research Projects Agency). At DARPA, he initiated five new programs primarily related to the development of aerospace technologies, for which he received a Distinguished Service Medal. "I hope to convince our faculty members that such experiences at government labs—and in College Park we are close to so many of them—not only allow us to serve our nation, but also give us a better understanding of funding organizations and the proposal process that will yield us more and better grants over time," Pines explains. He also held positions at the Lawrence Livermore National Laboratory (LLNL), Chevron Corporation, and Space Tethers, Inc. At LLNL, Pines worked on the Clementine Spacecraft program, which discovered water near the south pole of the moon. A replica is in the Smithsonian Institution's National Air and Space Museum.

Pines also foresees great opportunities in extending the Clark School beyond College Park. He points to the school's recently announced partnership with the College of Southern Maryland, the Southern Maryland Higher Education Center and the Naval Air Warfare Center Aircraft Division as a prime example. This partnership will explore joint education and research efforts and establish four-year aerospace and mechanical engineering bachelor's programs in southern Maryland, close to the Patuxent River Naval Air Station. As these degrees are not available in the region, the partnership could open new employment opportunities and improve the area's economy.

### A Stellar Academic Portfolio

Pines credits his parents for his own success and that of his identical twin brother, an electrical engineer. "My parents did not pursue higher education, but my father was one of the smartest people I have ever known. He had an incredible memory and a creative way of thinking about things," Pines says. "The home environment my parents created and the commitment they made to their children are inspiring."



Dean Pines hopes to continue teaching, which he feels keeps him "fresh, honest and an integral part of our educational mission."

Their commitment stands behind Pines's stellar resumé. He earned a Ph.D. in 1992 and an M.S. in 1988 in mechanical engineering from the Massachusetts Institute of Technology. In 1986, he received a B.S. in mechanical engineering from the University of California, Berkeley. He came to Maryland in 1995 as an assistant professor in the Clark School and has served as chair of the Department of Aerospace Engineering since 2006 (after his work at DARPA).

Under his leadership, the Clark School's aerospace engineering department was recently ranked ninth overall among U.S. universities, up from 11th last year, and fifth among public schools in the *U.S. News & World Report* graduate school rankings. During his tenure as chair, the department ranked in the top five in *Aviation Week and Space Technology's* Aerospace and Defense Workforce Study.

Pines has directed the Sloan Scholars Program for minority doctoral students since 1996, and the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc., which provides corporate scholarships to minority students pursuing graduate degrees, since 1999. He has also served as chair of the Engineering Council, director of the NASA Constellation University Institutes Project and director of the SAMPEX (Solar, Autonomous and Magnetospheric Particle

Explorer) flight experiment. Last year, he was a member of the University of Maryland's strategic planning steering committee.

### Finding Time for Research, Teaching and Meeting Alumni

Pines's current research focuses on structural dynamics, including structural health monitoring and prognosis, smart sensors, and adaptive, morphing and biologically-inspired structures, as well as the guidance, navigation and control of aerospace vehicles. He is a fellow of the Institute of Physics and an associate fellow of the American Institute of Aeronautics and Astronautics, and he has received a National Science Foundation CAREER Award.

He still hopes to teach at least one course each semester. "Teaching keeps me fresh, honest and an integral part of our educational mission," he says.

This spring he is taking time to travel the country, visit with alumni, share his vision for the Clark School and invite them to get involved. "I will depend on our alums to provide guidance, judgment, useful connections in business and government, volunteer work as mentors, and sponsorship of internships and other opportunities for our students. Their commitment is critical to our future success, and I believe our alums understand this and will join in." ■

# Friends, Colleagues and Alumni Laud New Dean

## "DARRYLL PINES

EXUDES ENERGY AND ENTHUSIASM THAT ARE INFECTIOUS. THESE ARE ATTRIBUTES THAT ARE SURELY NEEDED IN THE CLARK SCHOOL DEAN AS HE HELPS US CLIMB TO THE TOP LEVEL AMONG PUBLIC COLLEGES OF ENGINEERING NATIONALLY."

—Robert E. Fischell Distinguished Professor William Bentley, chairman of the Fischell Department of Bioengineering



Dean Pines discusses a research project with graduate students.

"Darryll Pines is highly innovative, motivated and committed to the success of the Clark School. He is an experienced and energetic administrator who knows the important values in an academic institution, and he will make those values his guideposts as dean of the school."

—Herbert Rabin, former interim Clark School dean

"WE ARE EXTREMELY FORTUNATE TO HAVE DARRYLL PINES TAKING THE HELM OF THE CLARK SCHOOL OF ENGINEERING. THE BREADTH OF HIS TALENT IS EXTRAORDINARY: AS A SCHOLAR, AN INNOVATOR AND AN ADMINISTRATOR. HIS PROFESSIONAL EXPERIENCES BEYOND THE UNIVERSITY WILL SERVE THE CLARK SCHOOL WELL IN THE DEVELOPMENT OF PARTNERSHIPS WITH GOVERNMENT AND PRIVATE BUSINESSES, AND HIS LEADERSHIP WILL PROPEL THE CLARK SCHOOL TO EVEN GREATER HEIGHTS."

—C.D. Mote, Jr., University of Maryland president

"Darryll was an outstanding program manager at DARPA for several ground-breaking projects, from deep-space navigation without global positioning systems to advanced unmanned air vehicles. He is incredibly bright, and he is good at getting diverse groups of people to work with him. He will be a real energy force with lots of fresh new ideas for the Clark School."

—Art Morrish, vice president and chief technology officer for the products group of L-3 Communications and former director of the technology office at DARPA



**"Successful DARPA** program managers are both technical experts and great managers. They are driven individuals who know how to make things happen. Darryll Pines epitomizes these traits. He will be a terrific dean and will lead the Clark School of Engineering to make many notable achievements in the coming years."

—Tony Tether, director of DARPA

"Darryll Pines is good at identifying new opportunities, advocating for projects and moving them forward. His off-campus experience is crucial for established research programs; he has the connections and the knowledge of the process to give guidance. In addition, he relates well to students; he enjoys them. They admire him as do the rest of the faculty. With his integrity and his sense of kindness and fairness, we couldn't have asked for a better dean."

—Chris Cadou, Clark School associate professor of aerospace engineering

**"Darryll had an** extraordinary dedication to making the aerospace department among the best in the nation. He has the same vision and dedication for the Clark School. He has an excellent knowledge of where cutting-edge research is headed, and he has the work ethic to make things happen within the school."

—William Fourney, Keystone Professor and former chairman of the Clark School's Department of Aerospace Engineering

"Dr. Pines is committed to all of his students. He was always willing to take the time to talk with us about anything we wanted to discuss whether or not it was related to research. Dr. Pines is one of the most honest and forthright individuals that I know. Through his own example, Dr. Pines has taught me the importance of dedication, honesty and self-sacrifice in everything I do."

—Paul Samuel, B.S. '96, M.S. '99 and Ph.D. '03, aerospace engineering, president and senior engineer for Daedalus Flight Systems, LLC and former student of Darryll Pines

"As chairman of the Clark School of Engineering Board of Visitors, I'm looking forward to working with Dr. Pines as he takes the school to the next level. Our job will be to support new ideas and push as hard as we can to make them a reality. Dean Pines will accept nothing less. What could be more exhilarating than realizing the destiny the Clark School deserves?"

—Tom Scholl, partner, Novak Biddle venture capital firm

**"I HAVE BEEN** PRIVILEGED TO WITNESS THE RISE OF THIS BRILLIANT YOUNG ENGINEERING SCHOLAR FROM HIS START AS AN ASSISTANT PROFESSOR, THROUGH THE RANKS OF THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY, TO CHAIR OF THE AEROSPACE ENGINEERING DEPARTMENT, AND NOW TO THE DEANSHIP OF THE CLARK SCHOOL OF ENGINEERING. AT THIS CRITICAL TRANSITIONAL TIME FOR THE SCHOOL, DARRYLL'S ENGAGING AND UNIFYING MANNER, HIS REPUTATION FOR BRINGING FRESH IDEAS TO THE TABLE, HIS HIGH ENERGY LEVEL, AND HIS ABILITY TO BUILD ALLIANCES WILL ADVANCE THE SCHOOL TO THE RANK OF THE VERY BEST IN THE WORLD AND ENSURE THAT STUDENTS ARE FULLY PREPARED TO HELP ADDRESS THE MANY CHALLENGES THAT THE MODERN WORLD PRESENTS."

—Nariman Farvardin, senior vice president for academic affairs and provost at the University of Maryland and former dean of the Clark School

# Helping Clark School Students Succeed

By David Taylor  
Photos by Mike Morgan





**I**magine yourself as a Clark School student today. You're taking on the greatest academic opportunities and challenges that you've ever faced, while navigating the intricacies of course selection and exploring professional, social and community service options. Not to mention putting the finishing touches on growing up (and, with a little luck, having fun).

The demands can be daunting, but the Clark School now offers a brand new space—with an array of streamlined resources managed by experienced professionals—to help you take advantage of every opportunity the school offers. Welcome to the Clark School's new Student Affairs Suite, a bright and welcoming spot in Glenn L. Martin Hall for students, corporate and government recruiters, and visiting alumni.

The new suite takes you by surprise. Turning in from a busy ceramic brick hallway, you enter a newly refurbished group of offices with sleek furnishings and soothing colors. Immediately, you are put at ease. Five key student services are available in this central location: Undergraduate Recruitment and Special Programs, Undergraduate Advising and Academic Support, the Women in Engineering Program, the Center for Minorities in Science and Engineering, and Engineering Co-op and Career Services. Formerly scattered among various offices on the first floor of Martin Hall, these programs now have a unified location where they can fulfill their complementary mandates. The five functional areas surround a spacious lobby waiting area and a shared conference room.

## Here to Serve

Alyson Blair, B.S. '09, fire protection engineering, often finds herself in the new suite through her activities with the Women in Engineering and the Clark School Ambassador programs. "If you have a problem," says Blair, "someone in that suite can help you. Everything you need for support is right there."

"The services provided by all of these offices impact every undergraduate student and more and more graduate students," says Gary Pertmer, associate dean of student affairs for the Clark School. "Student affairs is part of a student's life from recruitment to freshman orientation sessions to career services and job placement. This is an office where students interact throughout their



Advisors help students with selection of engineering majors and courses.

years at the Clark School." He adds, "This new configuration was sorely needed."

"The most obvious change is that it looks so beautiful," says Heidi Sauber, director of Engineering Co-op and Career Services. Beyond aesthetics, the new look announces that "the school cares about its students and about employers." She admits initial skepticism about placing all five offices in one location, but as the suite took shape, her doubts evaporated. "It feels easy to navigate and customer-friendly," she says.

## Strong Demand Holds for Engineering Graduates

Sobering economic news and the worldwide financial crisis have students seriously thinking about their futures. Fortunately, as Heidi Sauber, director of Engineering Co-op and Career Services, explains, most Clark School graduates still have excellent job prospects. Since the economic downturn, Sauber has not noticed a big difference in recruiting demand for Clark School students. In fact, in fall 2008 her office was busier than ever. "What I don't know yet," she says, "is whether there will be an effect on the number of job offers our students receive."

That, of course, is what many graduating seniors are wondering this spring. But Sauber says the picture for them is generally bright. At career fairs, employers are still expressing a need for engineers.

"In the past few years, the highest demand has been for graduates in electrical and computer engineering, civil engineering, and fire protection engineering," explains Sauber, who notes that fire protection has a 100 percent placement rate.

Far from being fearful about the downturn's effects, Sauber hopes it may actually widen the pool of employers who hire engineering students. While the larger employers may not be filling as many positions, that could provide opportunities for a more diverse range of small to mid-size employers to recruit. As a result, a wider recruiting net is cast for future graduates.

Internships offer students additional learning opportunities. When the economy is even slightly shaky, the demand for intern and co-op students rises. In hard times, employers look for a less expensive work force, which translates into internship and co-op jobs that can be good entrées into full-time job opportunities. Sauber points out that 88 percent of co-op students who apply to their respective employers for full-time jobs receive offers.

In May 2008, 67 percent of the Clark School graduating class had lined up full-time jobs, and 19 percent were headed for graduate school. "Clark School students have always had the bonus of an active job market here in the D.C. area," says Sauber. "Our students represent the school very well."

The new suite was the brainchild of the university's Senior Vice President for Academic Affairs and Provost Nariman Farvardin while he was dean of the Clark School. Plans for the new suite began when the dean's office moved to the Jeong H. Kim Engineering Building in 2005, creating new options for consolidating student services in one place. "We are all very grateful to the vision of the school's leadership and to the many people who worked so hard to make this a reality," says Sauber.

"The interior design firm made the best possible use of the space," explains Pertmer. As a result, staff members are working in more innovative ways, whether it's developing a new web site to help freshmen and their families adjust to college or creating new programs that promote engineering leadership.

## Getting In

Whether you are a prospective student considering the Clark School and looking for scholarship assistance, or an undergraduate exploring international program options and leadership opportunities, you will find answers to

your questions at the Office of Undergraduate Recruitment and Special Programs. Director Jane Fines and staff members meet with hundreds of promising students annually, on campus and at high schools, and carefully evaluate submitted applications to ensure each incoming Clark School class represents the best and the brightest students as well as those with diverse experiences and interests. Students' first visits to the Clark School are even more welcoming now, thanks to the new suite.

To reach more high school students early in the decision-making process, Fines has expanded the Clark School Ambassador program. The program began three years ago with faculty and staff visiting secondary schools to excite younger students about engineering. Now current Clark School students are talking with the region's top high schoolers. "Prospective students like to hear from those closest to where they are in life," Pertmer observes.

Among prospects and undergraduates alike, one of the hottest areas of interest is the international student experience. From study-abroad programs to a minor in international engineering, students increasingly want to round out their Clark School coursework with an international component. Caine Francis, international programs coordinator, increases student interest through information sessions in which students returning from study abroad share their experiences with classmates. Throughout 2008, Fines says her staff placed 100 students in international programs. That's in addition to promoting leadership programs, including a new minor in engineering leadership development, and connecting students to research and teaching assistant opportunities.

## Choosing the Right Major

Every undergraduate and graduate student knows that course registration can be crowded and confusing, but the new suite makes the process flow better than ever. "The layout allows us to provide more focused, timely customer service," says Jenna Dolan, director of



Students access personal and online support at the Center for Minorities in Science and Engineering.

Undergraduate Advising and Academic Support. She adds that her staff can now coordinate more easily when students need additional support services.

"We primarily help undecided engineering students" as they seek information and choose their majors, notes Dolan. "It is important to provide an uncluttered space for addressing those questions and searching for resources."

Dolan credits Farvardin for his vision of the new arrangement and uses his theme for the Kim Engineering Building in talking about the suite: "On entering it, you see the 'future of the Clark School and engineering.'"

The change has brought unexpected benefits, Dolan observes. Her office has improved work practices, such as moving toward a paperless office. "We're embracing technology and scanning more documents rather than making copies all the time." Before the move, Dolan estimates more than one third of the calls the office received were misdirected. A new telephone number means callers are reaching the right office to handle their questions, which translates to more responsive service to students. The savings in time and money have allowed the undergraduate advising office to launch new programs, such as Partnership for Future Engineers ([www.eng.umd.edu/pfe](http://www.eng.umd.edu/pfe)), a web site designed for new students and their parents that highlights resources available from the advising office.

## Welcoming Women

If you are a female Clark School prospect or current student, the Women in Engineering program (WIE) offers activities and events that not only build camaraderie but support the recruitment and retention of female engineering students at all levels. Paige Smith, WIE director, could not be more enthusiastic about the program's new quarters. "We feel like we've died and gone to heaven," she says. Two full-time staff, two graduate students and up to five undergraduate assistants were formerly crowded into a



Members of the Society for Women Engineers seek career advice from a Northrop Grumman representative.



cramped two-room office. “Now,” she says, “everyone has space to gather as a group or to work separately on individual tasks, depending on what’s needed.” A small waiting area makes the office policy of walk-in access without an appointment a reality.

Smith can now meet comfortably in the suite’s conference room with those friends and alumni of the Clark School who volunteer as WIE mentors for students. “The new space brings people here in ways that just weren’t possible before,” she says. On a recent morning, she met with a student who was undecided about her major and wanted to know more about how to transfer into the Clark School. They simply walked directly to the nearby Office of Undergraduate Advising and Academic Support for help and information.

### “Wow, I can do this!”

If you are a middle- or high-school student looking for a summer program to help you explore the possibilities of engineering, your first stop might be the Center for Minorities in Science and Engineering (CMSE). That’s part of what LaWanda Kamalidiin, associate director of CMSE, enjoys most about the job: “watching the pre-college students and seeing the light bulb come on as these students realize, ‘Wow, I can do this!’”

The suite serves as the control center for all CMSE programs: more than a dozen pre-college programs, eight retention programs, three recruitment programs, four outreach and Saturday programs, and the Louis Stokes Alliance for Minority Participation. It’s also now easier for CMSE staff to collaborate with WIE and other special programs.

### Finding a Great Job

As you approach the end of your Clark School career, all thoughts turn to the future. The Engineering Co-op and Career Services office can help you chart your next moves. The office has broadened its reach, and new teleconference capabilities now allow recruiters nationwide to interview Clark School students. Not long ago, a North Carolina-based employer inquired about conducting interviews by teleconference. “This is the first year I’ve been able to say that we offer that option,” says Sauber.

Her office also provides online job listings, campus interviews, information sessions over pizza, networking events, and workshops on topics such as how to interview for a job. The new suite provides a warm and welcoming atmosphere for such gatherings. That’s important for a place that is the point of entry into the Clark School for many people. “I’ve had students and employees both comment on what a positive impression this suite makes,” Sauber says.

Career assistance for graduate students is another expanded service offered in the new suite, says Pertmer. “The Clark School supported the enhanced staff resources,” Pertmer notes. That

support has paid off, judging by the capacity enrollment in workshops for graduate students and individual sessions on post-doctoral job search strategies and salary negotiation.

“My first contact with Career Services was when I attended one of their workshops on interviews,” says Joshua Johnson, M.S. ’09, aerospace engineering. The workshop and the follow-up mock interview burnished his presentation skills, he says.

Supratik Datta, Ph.D. ’09, aerospace engineering, watched construction on the suite proceed last summer. When the dust settled and he learned what the new suite housed, he signed up for a resumé workshop offered by Career Services. After five years in graduate school, he felt the need to brush up his curriculum vitae. “It’s been very helpful,” he says. “It is reassuring for students, especially in transition phases, to know that help is available as they prepare for the next chapter of their lives.”

Katie Lambertson, B.S. ’09, civil engineering, has worked with Co-op and Career Services as a peer adviser, spending up to nine

hours each week helping other students polish their resumes for posting on the Clark School’s eLink. This web-based employment database gives students round-the-clock access to co-op and internship job listings and on-campus interview schedules, and allows students to share resumes with potential employers.

Recruiters have long held a high opinion of the Clark School, and expect to meet highly-motivated, well-trained students as well as professional staff who understand their needs. The new suite has bolstered their impressions. Aris Cleanthous, engineering manager for Black & Decker’s world headquarters in Towson, Md., visited several times this fall and found the new suite “refreshing and inspiring.” The new rooms made his recruiting visit more efficient, enabling

him to bring several colleagues and conduct four concurrent recruiting sessions. Cleanthous expects that Black & Decker will continue to make annual recruitment visits to the Clark School.

### Providing One-Stop Shopping

Whether they are looking for advice on courses to take, programs geared to their special interests or ways to improve interview skills, the Clark School offers students simplified and streamlined one-stop shopping to improve their overall student experience. “With the new Student Affairs Suite, students, recruiters and even alumni have a single location where they can get the support and information that they need,” says Pertmer. ■

*David Taylor is a freelance writer who has written extensively for the National Science Foundation and the National Academies. His work has appeared in Smithsonian, Baltimore, Chesapeake Bay and other magazines.*



Representatives from NASA and other leading government agencies and corporations recruit Clark School students.

## New Team Drives to Complete Clark School's Historic Campaign

# GOAL

### Pines and Borak Call for Alumni and Friends to Support Effort

For years, Leslie Borak has watched the progress of the University of Maryland. "Maryland has become a top flight research university in the last two decades, and the A. James Clark School of Engineering has always been the jewel in the university's crown," says Borak.

Last fall Borak joined the Clark School as assistant dean for external relations with responsibility for leading the Clark School's \$185 million portion of the university's \$1 billion *Great Expectations* campaign. "The Clark School has the capacity to address global problems and issues," says Borak. "I want to bring all of my background in advancement management to help the school achieve its campaign goal and make a significant difference in the world."

The timing of her arrival could not have been better, coinciding with the appointment of the Clark School's dynamic new leader, Dean Darryll Pines. Together, they form the backbone of a new senior management team that will drive the Clark School to complete the most ambitious fundraising effort in its history.

"Leslie Borak is a consummate development professional who brings to the Clark School both the ability to secure major gifts and to direct the operations of our exceptionally successful fundraising team," Pines notes. "We will benefit greatly from her astute leadership as we drive to the conclusion of our ambitious campaign goal."

Borak has more than 20 years of experience directing fundraising campaigns at major universities and colleges. Her fundraising knowledge and experience, combined with Pines' energy and vision, will

help inspire the Clark School's dedicated alumni, faculty, staff, Board of Visitors and corporate partners to contribute generously to the school's campaign in what Borak calls "visionary philanthropy"—informed giving that leads the school to new heights in new areas.

In the coming months, Borak looks forward to travelling with Pines around the region and the country to share the Clark School's dramatic progress with alumni, friends, corporate leaders, and prospective parents and students. "Through a series of large and small events, we will introduce Dean Pines and let our constituents hear firsthand his vibrant vision for the school," Borak says.

The school's heightened philanthropic efforts come as the *Great Expectations* campaign moves past the halfway point and broadens its reach to all friends and alumni. More than \$558 million has been raised by the university toward its \$1 billion goal. The landmark campaign has positioned Maryland among a group of leading higher education institutions across the country currently engaged in such ambitious fundraising efforts.

To date, the Clark School has raised more than double the amount of any other college or school on campus, notes Borak, who was formerly vice president for development and alumni affairs at Goucher College in Baltimore. Previously she served as director of institutional advancement at the Smithsonian Institution and as executive director of development for the George Washington University Law School.

"As the university campaign reaches the midway point, we have attained more than 70 percent of the Clark School goal," says Borak. "I feel fortunate to work with such a dedicated dean and to have inherited a strong development program that has such a loyal constituency."

To leverage the Clark School's momentum and ensure it raises its remaining \$50 million, Borak is strengthening the development team and coordinating with Pines to align the development infrastructure with his goals and priorities. "We want to engage all Clark School departments and colleagues who might have development portfolios and reach out to them to be sure we are all growing together," says Borak. "We will be focused on meeting the Clark School goals set in the university strategic plan, many of which have price tags attached."

By the end of the campaign, Pines and Borak are hopeful that the Clark School will have a sustainable endowment that will place it on firm financial footing for decades to come. But the work doesn't end there. She notes, "We also need to plan for post-campaign activities to maintain the level of giving the Clark School has achieved." ■





# You Can Make a Crucial Difference

Facing a challenging economy, growing numbers of prospective and current Clark School students are seeking financial assistance to pay for college. "In this difficult time, Dean Pines and the faculty ask that we all do more to help our students," notes Leslie Borak, Clark School assistant dean for external relations. "Support from alumni and friends lets us add to the students' own mix of loans, and helps

decrease the burden students will carry when they graduate." She notes that donors may face some of the same challenges, and asks that they make the Clark School a top philanthropic priority. "We ask that you include the Clark School in your giving, at the level that is right for you," she says. "Keep us among those you continue to support." Contact her at 301-405-0317 or [lborak@umd.edu](mailto:lborak@umd.edu) for more information.

## Needed: Scholarships and Fellowships

The Clark Scholarship Endowment is providing large and small scholarships for undergraduates based on merit, need and diversity. Further support is needed to help even more undergraduates, and especially to fund graduate student fellowships. The Clark School is the source of many of the nation's top engineering graduate students and is, in fact, the nation's leading source of African-American doctoral degrees. Yet our fellowship endowment is less than 10 percent of the mean fellowship endowment at the top five public engineering schools. Your gifts will help these brilliant young engineers complete their training and become vital contributors to society.

PHOTO BY JOHN T. CONSOLI

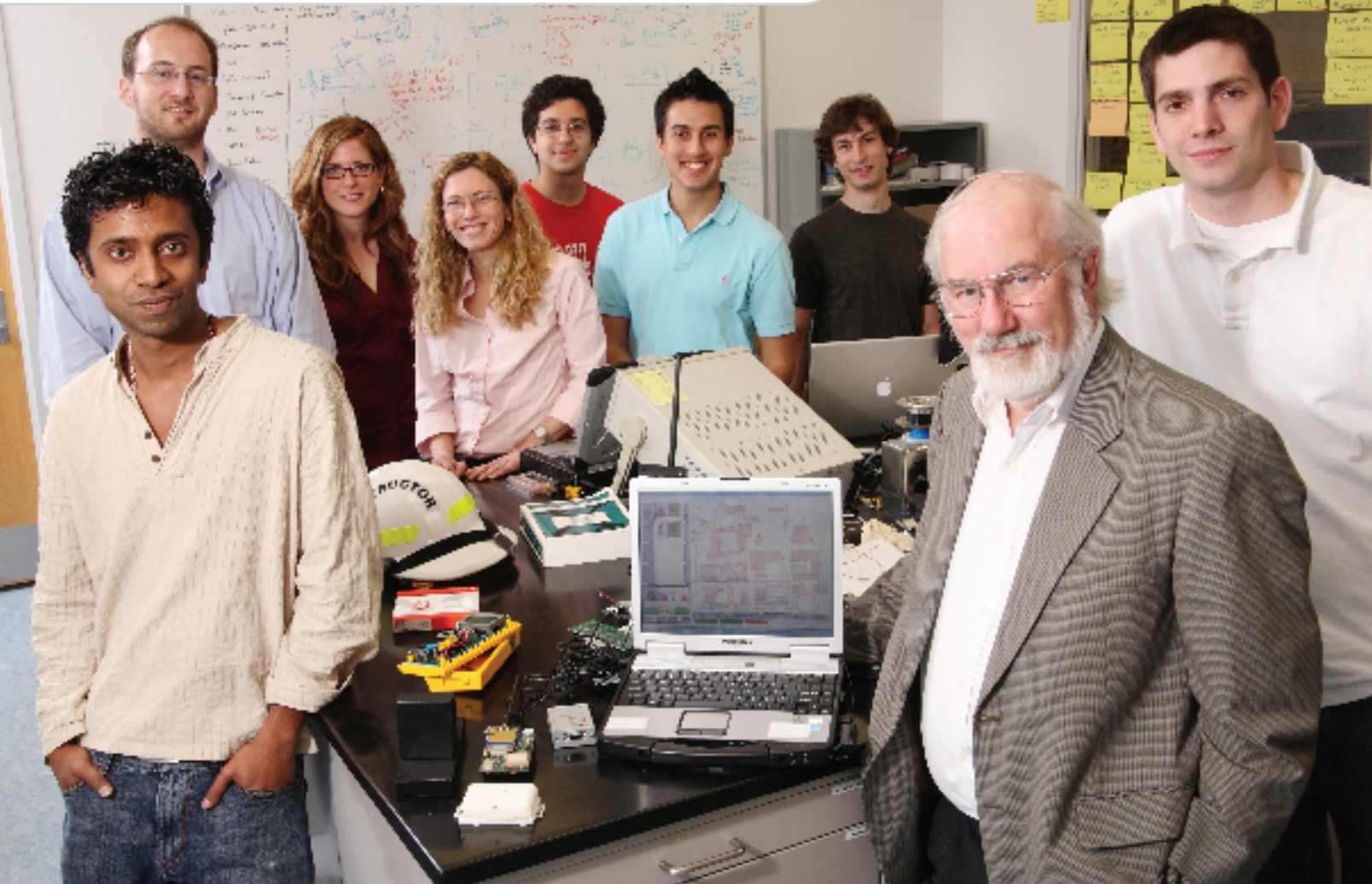
## Help Us Produce New Teachers

As a leading academic institution, the Clark School has a responsibility to produce outstanding engineering teachers who can instruct and mentor future generations of students. Our Future Faculty Program prepares selected Clark School doctoral students for successful careers as university teachers and researchers; provides stipends to support their work and activities; and helps place them in leading engineering schools where they can launch careers and form new partnerships between those schools and ours. Your gifts to the program will help to ensure the future of engineering education.

## Support Students in the Crucial First Two Years

The first two years of engineering education are a significant challenge for even top students. The Clark School has created the Keystone Program to ensure that our best professors teach our most elementary classes, thereby improving student retention and graduation rates. The program provides each Keystone professor with a base salary increase, discretionary funds and support personnel. Your gifts will help us extend the program to more of our first- and second-year courses, ensuring that more of our students receive the very best educational experience in their early years at the Clark School.

PHOTO BY JOHN T. CONSOLI



The TRX team from left, Amrit Bandyopadhyay, M.S. '06, electrical engineering (EE); Eric Asher Kohn, B.S. '08, computer engineering; Karina Drees; Carole Teolis, B.S. '86, math and EE, M.S. '90 and Ph.D. '94, EE; Daniel Hakim, computer science student; David Lemus, B.S. '07, mechanical engineering; Leo Singer, physics student; Benjamin Funk, B.S. '05, EE, and founder Gilmer Blankenship, professor and associate chair of the Department of Electrical and Computer Engineering.

# TRX Tracking System to the Rescue

Company Cited as World's Top Security Start-up



Each and every day, firefighters throughout the world risk their lives to save others.

TRX Systems, a Greenbelt, Md.-based company that recently graduated from the Technology Advancement Program (TAP) administered by the Clark School's Maryland Technology Enterprise Institute (Mtech), is developing a lifesaving innovation that can reduce the risk firefighters face as they move through burning buildings.

The company has developed a prototype technology that can effectively track people inside multi-story buildings and relay information to colleagues outside. TRX's first responder personnel location, tracking and monitoring system works in any building—no special instruments or site preparation are required. The system provides accurate, reliable locations in three dimensions, indoors and out, regardless of weather conditions or the availability of global positioning systems.

Late last fall, TRX Systems took first place in the third annual Global Security Challenge competition. TRX was awarded a \$500,000 federal contract from the Department of Defense's Technical Support Working Group (TSWG), the national forum that identifies, prioritizes and coordinates interagency and international research and development for combating terrorism.

TRX's tracking system has two main components: a tracking module and a communications module. The tracking module, worn on the firefighter's waist, calculates a firefighter's location with inertial and other sensors and then relays this information to the communications module, worn anywhere on the body. Using wireless radio, the communications module conveys firefighters' movements and vital signs to a base station.

One of the system's most innovative features is TRX's map generation software. "Our software enables the responders to generate a floor plan if one is not available when first responders arrive on the scene," says Amrit Bandyopadhyay, M.S. '06, electrical engineering (EE), and lead engineer at TRX Systems. "These floor plans can greatly improve situational awareness as well as improve tracking capability." The system's precision in locating and relaying health information dramatically decreases the time to identify and rescue firefighters in distress.

Ben Funk, B.S. '05, EE, vice president of development at TRX who has designed all of the system's hardware, describes the advantage that the company's affiliation with the University of Maryland has provided. In addition to the TAP program, "through the Maryland Fire and Rescue Institute (MFRI), we had access to leading firefighter research and to the personnel and facilities of the institute," says Funk. "MFRI has provided an invaluable amount of support and expertise to help us improve our product."

Carole Teolis, B.S. '86, math and EE, M.S. '90 and Ph.D. '94, EE, cites TAP support as critical. "TAP helped us turn our idea into a legitimate business," explains Teolis. "The company grew from two to seven employees during our tenure at TAP. Today, almost all of our 17 employees are university students, graduates or faculty members."

TRX was founded by Professor and Associate Chair of the Department of Electrical and Computer Engineering Gil Blankenship, who also started Techno-Sciences, Inc., an engineering company now based in Beltsville, Md., that has devel-

oped the world's most advanced satellite tracking stations and mission control centers for international search and rescue. Blankenship has conducted research in control systems science for more than 25 years.

Earlier this year, TRX Systems took first place in the Homeland Security Company category at the 2008 Maryland Incubator Company of the Year competition. The research and development efforts have been supported by TSWG, the Maryland Technology Development Cooperation, the National Science Foundation, the Department of Homeland Security, the Laboratory for Physical Sciences, the National Geospatial-Intelligence Agency, the Army and the Maryland Department of Business and Economic Development. ■

"TAP helped us  
turn our idea into a  
legitimate business."

## Two University Startups Honored

Two university start-up companies, Exponential Storage and Goozex, placed second and fifth respectively in the 2008 National University Startups Competition sponsored by the National Council of Entrepreneurial Tech Transfer.

Exponential Storage is answering the call as digital images and video files grow in size, numbers and accessibility. The firm, a Dingman Center for Entrepreneurship Portfolio Company, pro-

vides network storage projects that can deliver massive digital content files simultaneously to large numbers of users.

Goozex, short for Goods Exchange, is a leading video game trading

community. Launched in 2006, Goozex has become one of the most recognized outlets for acquiring video games. Members trade their games for Goozex points and use the points to get more games from other users. Goozex is currently an incubator company in Mtech's Technology Advancement Program (TAP).



# Aerospace Graduate Makes Mark on Manufacturing



**Stephen Ruffa, B.S. '82, aerospace engineering, delivered a Whiting-Turner Business and Entrepreneurial Lecture on lean dynamics at the Clark School last fall.**

companies can apply these lean techniques, other companies can do it as well."

That study served as the basis for his first book, *Breaking the Cost Barrier: A Proven Approach to Managing and Implementing Lean Manufacturing* (John Wiley and Sons, 2000). The book merited Ruffa the Shingo Prize for Excellence in Manufacturing Research, dubbed the Nobel Prize of Manufacturing by *Business Week*.

In his most recent book, Ruffa took lean manufacturing one step further to "lean dynamics"—describing how companies of all types can adapt to business shifts and create and sustain effective operations. "Lean dynamics incorporates capabilities that help companies right themselves when things go wrong," Ruffa says. He describes how, in engineering, dynamic stability is the property that allows a plane to right itself after being disturbed from a steady flight. "The most successful companies incorporate principles that seem to produce similar results," he adds.

Ruffa spent five years studying this concept, ultimately showing how manufacturing companies such as Toyota, and service companies including Southwest Airlines and Wal-Mart independently adopted a common set of principles to overcome severe challenges as they grew to lead their industries today. He shared the results from *Going Lean: How the Best Companies Apply Lean Manufacturing Principles to Shatter Uncertainty, Drive Innovation, and Maximize Profits* (AMACOM, 2008) when he gave a Whiting-Turner Business and Entrepreneurial Lecture here last fall.

"The lecture was my opportunity to get reconnected to the Clark School," says Ruffa, who now lives in the area. He looks forward to continuing his involvement with the school. "Maryland has been good to me," he says. To view the lecture, see [www.eng.umd.edu/whitingturner/archive/ruffa.html](http://www.eng.umd.edu/whitingturner/archive/ruffa.html). ■

The career of Stephen Ruffa, B.S. '82, aerospace engineering, is soaring, much like the aircraft he studied and helped develop. From a strong foundation in aerospace engineering and management, he has evolved into a recognized researcher, author and business advisor.

His mantra these days is "lean"—lean manufacturing and lean dynamics—principles that could give struggling U.S. businesses a competitive edge.

Ruffa spent the first 25 years of his career with the U.S. Department of Defense engaged in everything from the design, manufacture, test and repair of cutting-edge aircraft to projects ensuring the availability of critical supplies to meet sudden wartime demand. "I am proud of the

breadth of experience I gained working almost end-to-end across the business of aerospace," Ruffa says. "The Clark School's program gave me a great foundation."

Ruffa, who also earned an M.S. in technology management from University of Maryland University College in 1995, ultimately led a

worldwide manufacturing benchmark study of 17 major aerospace producers for the Joint Strike Fighter Program to determine how it

could apply "lean" concepts to break the cycle of escalating costs in aircraft production. As a manager, he implemented "a range of initiatives that eliminated the need to stock as much as \$1 billion in inventory," he says. "I realized that if aerospace and defense-related

**"The Clark School's program gave me a great foundation."**



# A Homecoming for Clark School's New Alumni Director

Josefina P. Simpson, B.S. '84, marketing, returned to her university roots last fall when she assumed the post of director of alumni relations at the A. James Clark School of Engineering. Awed by the progress she saw during a drive through campus, she became determined to work at the university.

"As I drove up Campus Drive and approached the big red M, I felt as if I had come home. It brought back so many memories for me," she recalls. Simpson moved with her family from the Philippines in 1969, and eventually she and three of her four siblings attended the University of Maryland. What's more, she grew up watching the commitment of her parents, both physicists, to their own alma mater. Each year they return to the University of the Philippines and volunteer to serve as guest professors.

Simpson brings that same dedication to her new position. "I have spent the better part of my career in client services, building rapport and relationships and gaining a level of trust with those I serve," says the former membership director for Argyle Country Club in Silver Spring, Md. "I hope to develop these same kinds of relationships with current students as well as Clark School graduates. I don't want students' first exposure to the alumni association to be when they graduate."

Her former position gave her extensive experience in membership marketing programs; she conducted new member orientation, prepared a monthly newsletter and directed community outreach

programs. She previously worked as director of administration for UNIGLOBE Travel (Mid-Atlantic) Inc. in Bethesda, Md.

At the Clark School, Simpson plans to assess alumni participation by department and then assist departments in bringing graduates back to

campus. Currently, the Clark School boasts some 28,000 graduates, and approximately 5,100 are members of the University of Maryland Alumni Association. "Our goal is to increase that number by 5 percent each year," she says.

She will also be a liaison to the University of Maryland Alumni Association to ensure the Clark School is aligned with the university's goals and priorities. The new university strategic plan has a huge focus on alumni relations and increasing membership in the alumni association by 2018. Simpson will also provide support to ongoing activities and events throughout the country to introduce new Clark School Dean Darryll Pines. "Clark School graduates have so much to be proud of, and we want to encourage all of them to visit the school and see our progress," she adds.

When it comes to planning events, Simpson hopes to involve alumni as guest speakers and student mentors. She even plans to give alumni visiting the school an opportunity to roll up their sleeves and experience the educational, research and other activities that today's students do. She adds, "We want to make events more interactive and fun, and show alums how much we have grown since their student days." ■



PHOTO PROVIDED BY JOSEFINA SIMPSON

## The Sky's The Limit

### Aerospace Engineering Doctoral Candidate Wins NSF Fellowship

When Nikesha Davis participated in an after-school program sponsored by the National Aeronautic and Space Administration, she met Aprille Ericsson-Jackson, the first African-American woman to receive her Ph.D. in aerospace engineering. "She sparked my interest in the field," recalls Davis.

Several years later, Davis, an aerospace engineering Ph.D. student at the Clark School, is generating her own flash. She has received the National Science Foundation's Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Fellowship for the 2008-2009 and the 2009-2010 academic years.

Originally from Upper Marlboro, Md., Davis received her B.S. in general science and mathematics from Spelman College along with a B.S.E. in mechanical and aerospace engineering from the University of Alabama, Huntsville (UAH). In 2008, she earned a master's in systems engineering

with a minor in aerospace engineering from UAH, researching spacecraft design.

At the Clark School, Davis is focused on helicopters, working with different types of materials and improving design to increase the efficiency of rotorcraft systems.

"I grew up in this area and have always been interested in the aerospace engineering program at Maryland," says Davis. "The research program here is diverse and interesting. It is a good place to learn and develop."

Her challenge at the Clark School is learning to ask for help. "I am doing research in a totally new area, and I've had to lean on the knowledge and skills of others. That's been a hard lesson for me, but it is also helping me grow and become a better researcher."

As a participant in the NSF program, which pairs graduate and doctoral students with mentors, Davis is also learning to prioritize her aspirations. At the suggestion of her mentor,



PHOTO PROVIDED BY NIKESHA DAVIS

Brad Gordon, a doctoral student in the Department of Chemical and Biomolecular Engineering, Davis penned a 'bucket list,' a set of personal and professional goals. She hopes to pursue two of those goals this spring: learning to fly and skydiving. ■

# The Winners' Circle

## Students Bring Home National Awards

**Whether it's building underwater robots, designing energy-efficient helicopters or building and racing formula-style cars, teams of students from the Clark School and other University of Maryland colleges are number one, winning major competitions and beating competitors from around the world.**

- The University of Maryland's student robotics group, Robotics@Maryland, won the Association for Unmanned Vehicle Systems International and Office of Naval Research 11th Annual International Autonomous Underwater Vehicle (AUV) Competition last summer. The Robotics@Maryland team designed and built an AUV capable of navigating underwater for realistic missions, beating 25 other teams from across the United States, India, Canada and Japan, including Cornell University,

University of Florida, U.S. Naval Academy, University of Victoria and Ecole de technologie superieure. In only its second year of participation, the Maryland team entered the final round in first place among the eight finalists, and held on to win the competition.

- The Clark School's aerospace engineering students placed first in the 25th Annual American Helicopter Society Design Competition in 2008. Using a Green Energy Efficient Design concept,

the students created a helicopter capable of operating from an unprepared area that minimizes energy consumption. This "SMART-COPTER" is capable of vertical takeoff and landing and can be operational by 2020. This marks the ninth time in 10 years that a Clark School team has emerged the victor, beating teams from the Georgia Institute of Technology, the U.S. Naval Postgraduate School and the U.S. Air Force Institute of Technology.

- The TerpsRacing team beat 83 others from around the world to win the Formula SAE West 2008 competition with a car designed, built and driven by University of Maryland students.
- Aerospace engineering undergraduate students won first place in the 2008 NASA Revolutionary Advanced Systems Concepts - Academic Liaison student design competition in Cocoa Beach, Fla., with Project TURTLE (Terrapin Undergraduate Rover for Terrestrial Lunar Exploration). ■

**Left, Robotics@Maryland team members ready their AUV for competition. Below, members of the Project TURTLE team with their rover mock-up.**



## Alumni News



**MICHAEL GRIFFIN**, Ph.D. '77, aerospace engineering, and former head of NASA, has received the National Space Trophy, the highest honor given by the Rotary National Award for

Space Achievement Foundation. He was also honored with the American Institute of Aeronautics and Astronautics Summerfield Book Award, along with co-author James French, for their book, *Space Vehicle Design, 2nd Edition*.

**PAUL C. HERSHEY**, M.S. '84 and Ph.D. '94, electrical engineering (EE), was promoted to engineering fellow at Raytheon. Previously chief engineer within Raytheon's intelligence and information systems division, he is one of only nine individuals to receive the honor.

**SANJEEV KHUDANPUR**, Ph.D. '97, EE, is an associate professor in the Department of Electrical and Computer Engineering at Johns Hopkins University.

**DAVID SADOWSKI**, B.S. '75 and M.S. '77, chemical engineering, has been named the assistant vice president for intellectual property management and commercialization at the University of Rhode Island.

**JAGANATH SANKARAN**, Master of Engineering and Public Policy '08, won a 2008 International Space University Scholarship from the National Space Society.



# Scholarship Support Broadens Opportunities for Talented Students

With one-third of the *Great Expectations* campaign targeting student support, the Clark School continues to raise much-needed funds to help talented students with limited financial means pursue an engineering education. Individuals and organizations alike are partnering with the school to meet growing student demand for financial assistance. Undergraduate scholarships and graduate fellowships tailored to the interests of donors are among the most meaningful ways that friends and alumni can ensure a brighter future for students.

## **ARCS Support Surpasses \$500,000**

Achievement Rewards for College Scientists Foundation, Inc. (ARCS), a national volunteer women's organization dedicated to providing scholarships to graduate and undergraduate students pursuing degrees in the natural sciences, medicine and engineering, is a long-time Clark School supporter.

"We started supporting Maryland in 1996," says Betty Polutchko, president of the Metropolitan Washington, D.C., chapter of ARCS. "We are so impressed with the scholars at the Clark School. These amazing young people have the potential to make so many important contributions to science and engineering in our country."

This academic year, the Washington, D.C., chapter is supporting two Clark School doctoral students and one undergraduate student. Cumulatively, ARCS has contributed to the Clark School more than \$500,000, raised through a range of fundraising events and private and corporate donations.

"We are concerned about the limited pool of scientists and engineers regionally and nationally," says Polutchko. "We invite students to many of our events, and we offer them networking opportunities. Nationally the members of our 14 chapters are dedicated to helping our country maintain its world leadership by supporting scholarships in science and technology."

## **Shapiro and Duncan Endowed Scholarship in Mechanical Engineering**

It's no surprise that Sheldon J. Shapiro and his siblings followed in their father's footsteps and attended the University of Maryland. The family lived within miles of the College Park campus.

That proximity made them natural Terrapin sports fans. "My

brother Jerry and I have always been avid fans and supported Maryland football and basketball," says Shapiro, but recently their attention has turned to academic support.

"We wanted to give back to the university in a different way," says Shapiro, who serves as chief executive officer of Shapiro and Duncan, Inc., the mechanical contracting firm his father founded in 1976. In 2008, the brothers established the Shapiro and Duncan Endowed Scholarship in Mechanical Engineering with a \$125,000 commitment to the Clark School.

Personal love of the university aside, funding the scholarship makes good sense for the Shapiro family business. "Over the years, our firm has hired many Clark School graduates," explains Shapiro. "They are great assets."

"As our business grows, we need more and more qualified mechanical engineers," says Shapiro. "Given the increased emphasis on energy efficiency and industry trends to comply with the Leadership in Energy and Environmental Design recommendations, we need mechanical engineers trained in these areas. In this one small way we can make a difference."

## **CEAM Supports Endowed Scholarship**

Last year, the County Engineers Association of Maryland (CEAM) celebrated 25 years of supporting civil engineering students at the university. CEAM, an organization of more than 600 county, state, municipal and consulting engineers, as well as public works personnel and contractors, has provided nearly \$500,000 in scholarship support to Clark School students since 1983.

"CEAM began grassroots efforts to raise scholarship money with raffles at conferences and fundraising events," explains Dale Copping, B.S. '73 and M.S. '75, co-chair of the CEAM Scholarship Committee. More recently, CEAM has endowed the Roger H. Willard Scholarship Fund to honor the organization's first president, promote civil engineering and encourage graduates to pursue careers in public works. The fund provides at least four annual scholarships for Clark School Department of Civil and Environmental Engineering students.

Copping knows firsthand the financial challenges parents and students face. His son Patrick Copping, B.S. '04, civil engineering, is now employed with a Baltimore consulting firm. "The magnitude of work in civil engineering is challenging and the need to maintain good grades is important. Students should not have to worry about paying for college on top of all of that."

The fund also serves another purpose for CEAM. "It gives us the opportunity to stay in touch with Clark School graduates," explains Copping. "The Clark School is one of the prime recruiting grounds for CEAM members." ■

**TO LEARN MORE ABOUT MAKING A GIFT TO THE CLARK SCHOOL, PLEASE CALL OR WRITE:**

Leslie Borak, assistant dean for external relations, Clark School of Engineering, University of Maryland, College Park, Maryland 20742-2831 ■ 301.405.0317 ■ lborak@umd.edu



## Do You Remember?

Do you know what is going on in the photo above? The names of the people shown? Send your answer to [mcorley@umd.edu](mailto:mcorley@umd.edu) and you may be eligible for a prize!

**GREAT  
EXPECTATIONS**  
THE CAMPAIGN *for* MARYLAND

[mcorley@umd.edu](mailto:mcorley@umd.edu) if you know what/who is pictured.

Past winners of this contest have won basketball tickets, commemorative books and other Clark School goodies – don't miss out!

### Fall 2008 Photo

*E@M* readers, we finally stumped you! No one was able to identify what was going on in last issue's back-cover image or the identities of any of the individuals pictured. Want to take another look at the photo? View it online (Visit [www.eng.umd.edu/media/e-at-m/](http://www.eng.umd.edu/media/e-at-m/) and click on the link for the Fall 2008 issue), then send email to

### Remember This

You can help to protect the Clark School's history and create an even brighter future by participating in *Great Expectations: the Campaign for Maryland*. Thank you for your support. ■



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