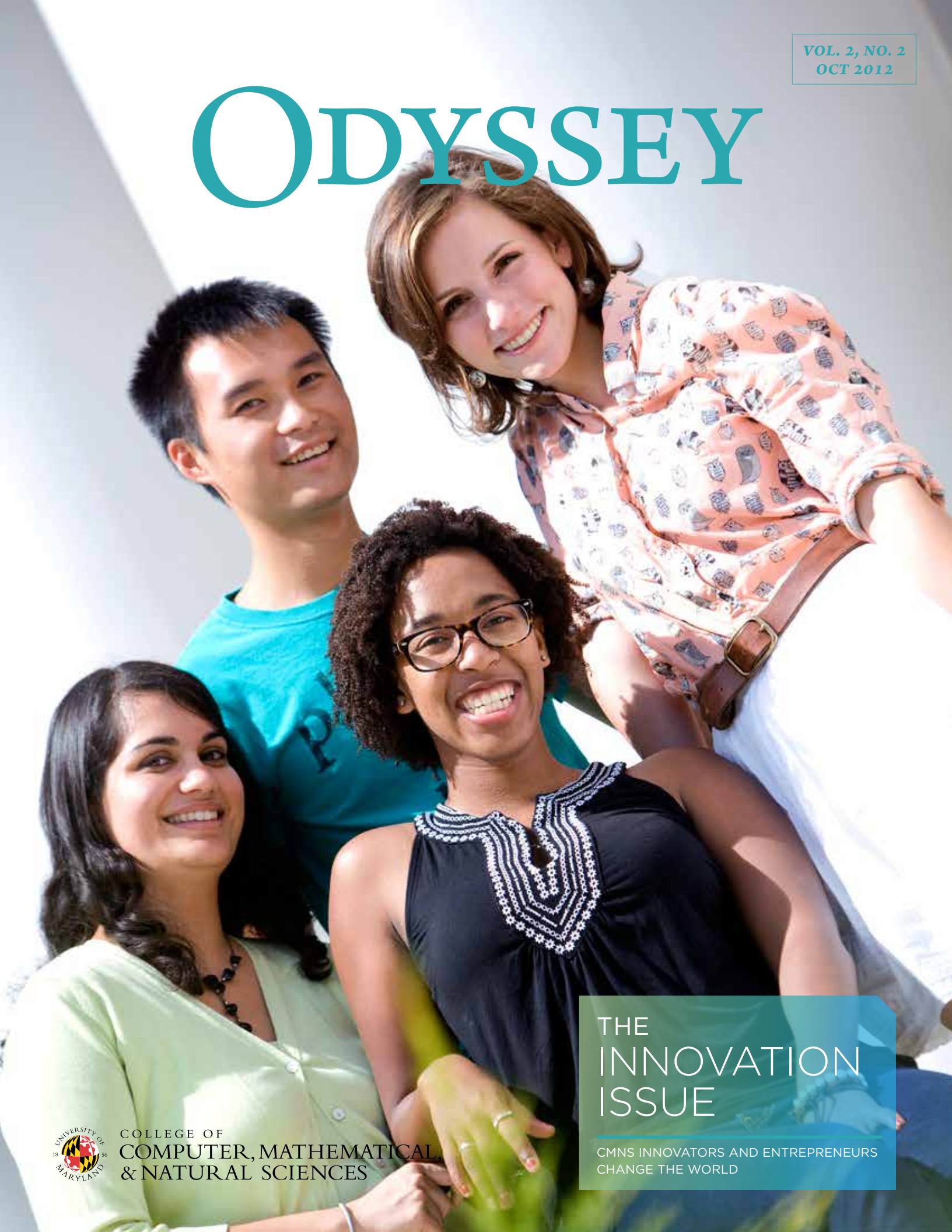


VOL. 2, NO. 2
OCT 2012

ODYSSEY



THE
INNOVATION
ISSUE

CMNS INNOVATORS AND ENTREPRENEURS
CHANGE THE WORLD



COLLEGE OF
COMPUTER, MATHEMATICAL
& NATURAL SCIENCES



Dear Colleagues, Students, Graduates and Friends,

Since his arrival at the university, President Wallace Loh has made academic excellence his mantra. Building on our strengths as a research university, Wallace has challenged us to become equally renowned as an innovation and entrepreneurship (I&E) university. With guidance from technology transfer and commercialization experts on campus and external constituents, the university is creating an Academy for Innovation and Entrepreneurship, which will promote signature instructional programs across disciplines; educate tomorrow's innovators and entrepreneurs; and foster and enhance innovative thinking, entrepreneurship and creativity.

We must prepare leaders for the future by making I&E a central aspect of our mission. The college is committed to developing a culture in which I&E infuses our curriculum so that all students are exposed to the tools that can help them transform ideas to creative actions that generate economic, social or cultural value. The college prides itself on the academic excellence of our students, and we are eager to achieve that same level of excellence in I&E. In the pages that follow, you will see firsthand that our students, staff, and faculty members are innovators and idea people. This issue highlights some of their most recent accomplishments in this arena.

On the subject of excellence, we celebrate two university leaders with ties to our college. Ann Wylie, Professor of Geology, has served this university in many capacities, including as the leader of the Graduate School; assistant

president and chief of staff; vice president for administrative affairs; and most recently senior vice president and provost. Ann, who recruited me to the university, is a role model for all of us. She demonstrates unwavering integrity, a straightforward approach, a deep commitment to excellence, and she consistently puts the university first in all of her actions. We welcome her back to our college.

Second, I am delighted that the university's new Senior Vice President and Provost Mary Ann Rankin is a member of our college. She has had an extraordinary career. As Dean of the College of Natural Sciences at the University of Texas in Austin, she raised the academic quality of the college. More recently, Mary Ann served as the chief executive officer of the National Math and Science Initiative, an organization charged with expanding the pipeline of successful STEM (science, technology, engineering and mathematics) graduates and STEM K-12 teachers. Mary Ann joined the CMNS Board of Visitors shortly after my arrival and effectively led a board task force on undergraduate education. I am delighted that she joins the college and truly is one of us.

In the months ahead, look for the college to integrate innovation and entrepreneurship more fully into our mission, for these are the engines that will drive economic growth and development in the years to come.

Jayanth Banavar
Dean



On the Cover

Physics majors (from right) Hannalore Gerling-Dunsmore, Delilah Gates, and Gary Chen, with the support of physics advisor Sonali Shukla (left), started a new, free tutoring program for fellow physics students on campus this fall. The program aims to improve the success of physics students by pairing upperclassmen with underclassmen in the physics program. The student-led initiative is designed to build community and support for young physicists, especially those from underrepresented groups. The program provides a great way for volunteers to give back and sharpen their own skills; walking a peer through a problem keeps physics fundamentals fresh for tutors as well. The tutoring center is open M-F from 4-6 p.m. in 1304 Physics. For more information or to volunteer as a tutor, contact Hannalore Gerling-Dunsmore at hannagd@terpmail.umd.edu. ■


 A photograph of DJ Patil, a man in a graduation cap and gown, speaking at a podium during a commencement ceremony. He is smiling and pointing towards the audience. The background is dark with some lights visible.

FAIL FAST TO SUCCEED EARLY

ONE OF WORLD'S
LEADING DATA
SCIENTISTS SHARES
ENTREPRENEURIAL SECRETS

DJ PATIL AT THE COLLEGE'S COMMENCEMENT CEREMONY IN MAY

Throughout high school and part of his college career, DJ Patil, data scientist in residence at Greylock Partners, admits he was a failure at mathematics. It was not until he began tackling his fear of failure that Patil learned how to analyze problems, develop and test solutions, and continue with the testing process until reaching the right answer.

Patil's ability to "fail fast" was honed during his doctoral studies at Maryland after failing his first graduate class and getting the second lowest score in the class on his first Ph.D. qualifying exam—only because the lowest score belonged to a student who was a no-show for the test. "I made up my mind at that point to stay in the game largely by failing, getting back up, and continuing to push ahead. I learned tenacity and failure go hand in hand," explains Patil. The sports analogy he offers: Aim for a homerun by going to bat as often as you can.

That mindset was instrumental in Patil's meteoric rise in the technology industry. The former chief product officer at Color, a video and photo sharing site, he also previously led the Analytics and Data Teams at the LinkedIn Corporation, overseeing all analytics projects including reporting, web analytics, and products that leverage LinkedIn's unique data set, such as People You May Know and Who's Viewed My Profile.

"At LinkedIn, we would build products quickly, test them, learn about what went wrong and test again," explains Patil. "If you looked at all the projects, code, design and time invested in building the company, it is shocking to see how many products did not work."

Before making the leap to the corporate world, Patil made the transition from a student in the college's top-ranked applied nonlinear dynamics and chaos group to a respected faculty member helping drive a major research initiative on numerical weather prediction. He then worked as an AAAS Science and Technology Policy Fellow for the Department of Defense, where he directed efforts that leveraged social network analysis and the melding of computational and social sciences to anticipate emerging threats to the United States. He also co-chaired a major review of U.S. efforts to prevent bioweapons proliferation in Central Asia and co-founded the Iraqi Virtual Science Library, which has been hailed as one of Iraq's most important education projects, helping Iraqi scientists, doctors and engineers rebuild their country.

As he embarks on a new stage of his career working with venture capitalists, Patil continues to view failure as an opportunity to succeed. At the college's May commencement ceremony, he urged graduates to allow themselves to fail as often and as quickly as they can. ■

FOUR TIPS FOR NEW GRADUATES

"First and foremost, find your passion and work on what you love. Once you find your passion, you will never give up, take no for an answer, or have patience for those that stand in your way."

"Surround yourself with people you value and those who value you. Keep company with individuals that inspire you to do better and are not afraid to tell you the unvarnished truth. It will hurt to hear, but it will allow you to iterate faster."

"Experience other people's lives and continue to share your own. Share your dreams, passions, heartaches and failures with those around you. That is how you learn about the human condition and the meaning of true relationships."

"Strive to put yourself in uncomfortable situations. The only way to stay on top of the curve is to keep learning. This means putting yourself in uncomfortable situations where you fail and teach yourself new skills as a result."



CMNS INNOVATORS AND ENTREPRENEURS CHANGE THE WORLD

It is no surprise that a new U.S. Chamber of Commerce report names Maryland the top state in the nation for innovation and entrepreneurship. For its part, the university generates about 130 invention disclosures each year, or close to one every three days. Throughout the university, including the classrooms, research labs, centers and institutes of the College of Computer, Mathematical, and Natural Sciences (CMNS), researchers are combining scientific and technical know-how with business savvy to develop products and services that have the capacity to improve the lives of people throughout the world.

“This national recognition reflects the efforts of the governor and general assembly to promote innovation across the state, the tireless work of the state’s successful businesses and entrepreneurs, as well as the university’s dedication to creating a culture of entrepreneurship among our faculty, students and alumni,” says University of Maryland Vice President and Chief Research Officer Patrick O’Shea. The number one ranking is a significant improvement over last year—Maryland ranked seventh in 2011.

BROADENING THE UNIVERSITY'S INNOVATION IMPACT

The university has supported hundreds, if not thousands, of research advancements, but university President Wallace Loh believes it can do even more to foster innovations that can enhance lives as well as boost job creation. "A great university in the 21st century has to be more than a great research university," Loh wrote recently in the university's *Terp* magazine. "It must also be an innovation and entrepreneurship university. It has to translate ideas to impact."

To that end, the College Park campus forged a strategic partnership with the University of Maryland, Baltimore this spring. Known as *MPowering the State*, the agreement leverages the expertise of each institution, encouraging collaborations between College Park researchers and Baltimore clinicians that could lead to new discoveries in areas such as bioinformatics and biomedical devices. The agreement also combines technology transfer and commercialization efforts at the institutions through the creation of a unified University of Maryland Ventures program.

Faculty researchers can now benefit in other ways from their innovations. The University System of Maryland (USM) will soon count patents and commercialization toward tenure and promotion decisions. In 2010, USM set a 10-year goal to create 325 companies based on academic research or aided by university economic development programs.

The university is also launching an initiative to make innovation and entrepreneurship a signature feature of the curriculum university-wide. The Innovation Academy at the University of Maryland promises to foster and enhance innovative thinking, entrepreneurship and creativity through programs that cross all disciplines.

All of the initiatives will contribute to a single goal: to create tomorrow's innovators, who will "solve the grand challenges of our era," according to Loh. Among the most pressing areas of concern: healthcare, sustainable energy, technology and agriculture.

"Our mission at CMNS is perfectly aligned with the direction the university is taking," affirms CMNS Dean Jayanth Banavar. "The college's multidisciplinary approach to problem solving, evidenced by the ever-growing number of collaborative research projects, allows us to bring together the best minds across disciplines to create viable options for solving many of society's critical problems."

HEALTHCARE: DEVELOPING MEDICAL ADVANCES

Deciphering the Mysteries of Aging

Sometimes scientific breakthroughs happen in the most unexpected ways—like when you are on vacation thousands of miles from your lab. Just ask Assistant Professor of Cell Biology and Molecular Genetics Kan Cao whose research focuses on the premature aging disorder Hutchinson-Gilford Progeria Syndrome (HGPS). Children with HGPS die in their early teens, typically due to heart attack or stroke. The rare disease is caused by a mutation in the gene *LMNA*.

In 2009, while still a postdoctoral researcher at the National Institutes of Health, Cao headed to China for a three-week break, tasking a student researcher with feeding HGPS cells with the immunosuppressant drug rapamycin. "I figured it would be a good practice exercise," says Cao. After three weeks, the cells began to improve, indicating that the drug might offer effective treatment. Cao continued the research after her CMNS appointment in 2010, publishing a groundbreaking paper on the effect of rapamycin on HGPS cells, and clinical trials are planned for the drug.

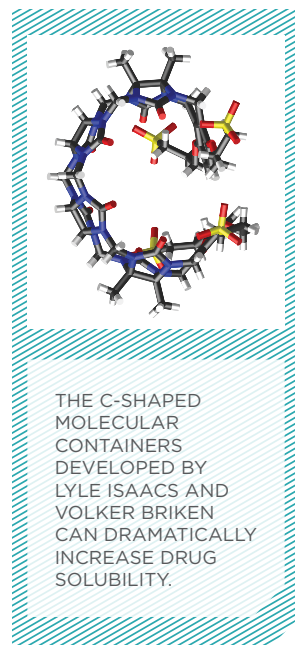
While Cao has her eyes on finding a cure for HGPS, her research could have far greater implications. "If we understand why the lamin A protein, produced from *LMNA*, causes such a drastic disease," says Cao, "it can help us decipher many, many mysteries of aging, including cardiovascular disease."

Expanding Pharmaceutical Possibilities

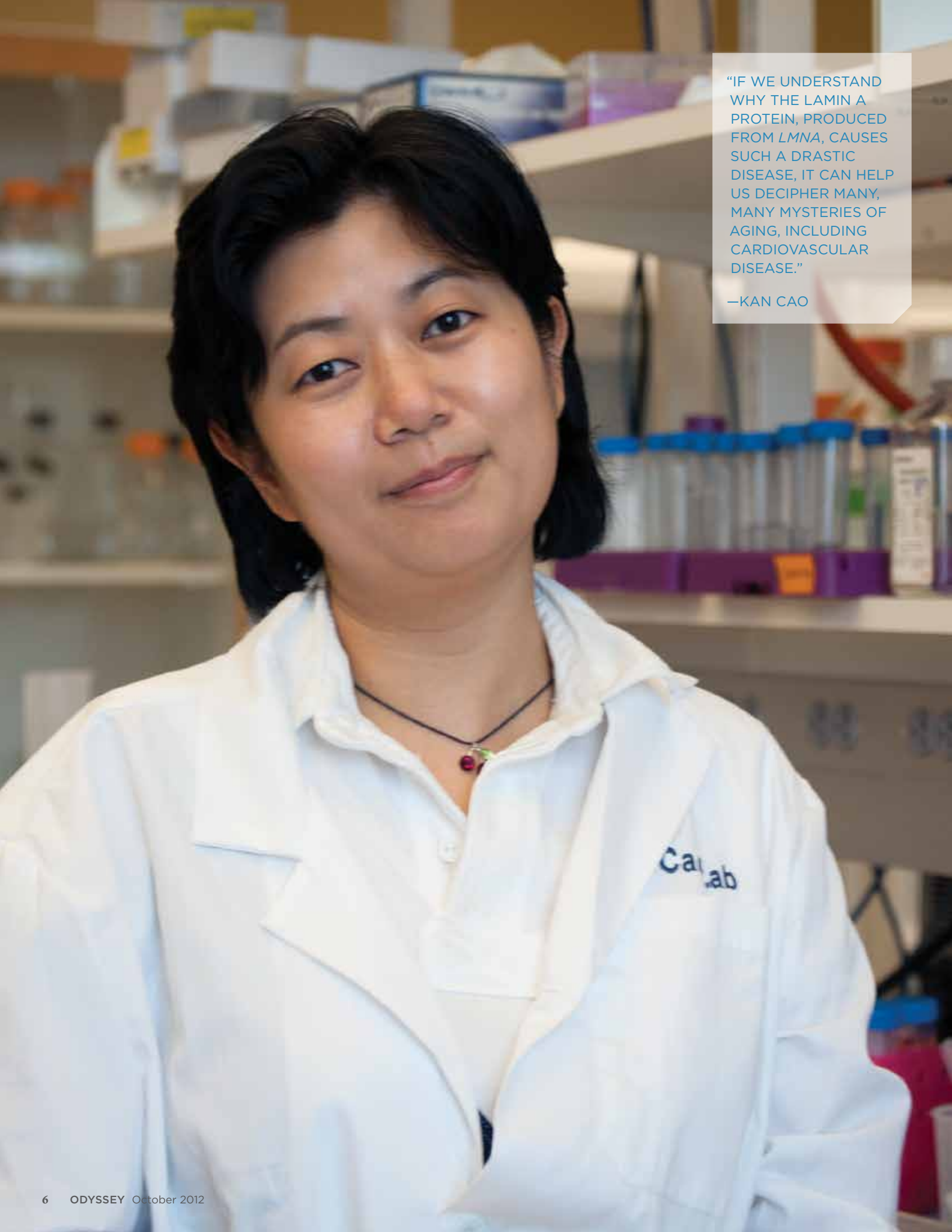
A CMNS research team has developed a way to make pharmaceuticals dissolve more quickly in the human body, paving the way for a host of new treatments. "About 40 to 70 percent of potential new drugs fail because they have low solubility in water," says Chemistry and Biochemistry Professor Lyle Isaacs, who is co-leading the interdisciplinary project with Associate Professor of Cell Biology and Molecular Genetics Volker Briken.

The Maryland team created C-shaped molecular containers that can flex to accommodate different pharmaceutical molecules. The containers increased the solubility of previously insoluble drugs up to 2,750 times, and tests indicate that the containers are especially effective delivering anti-cancer treatments. Isaacs had been researching molecular containers, known as cucurbiturils, for nearly a decade when Briken approached him about adapting them for drug delivery. Says Isaacs, "This is a great example of collaboration between a chemist and a biologist making progress that would not be possible on our own."

Briken notes that "we already are working with drug companies to test the use of the containers to deliver select drugs and hope to interest them in licensing our technology." The university's Office of Technology Commercialization has been instrumental in this process, helping the researchers apply for two patents. Grants from the Maryland Technology Development Corporation and the Maryland Department of Business and Economic Development help fund the research.



THE C-SHAPED MOLECULAR CONTAINERS DEVELOPED BY LYLE ISAACS AND VOLKER BRIKEN CAN DRAMATICALLY INCREASE DRUG SOLUBILITY.



“IF WE UNDERSTAND WHY THE LAMIN A PROTEIN, PRODUCED FROM *LMNA*, CAUSES SUCH A DRASTIC DISEASE, IT CAN HELP US DECIPHER MANY, MANY MYSTERIES OF AGING, INCLUDING CARDIOVASCULAR DISEASE.”

—KAN CAO

SUSTAINABLE ENERGY: CREATING A BETTER POWER SOURCE

Tiny nanostructures could have a big impact on the electric car industry, thanks to an energy storage system developed through a cross-campus collaboration. Chemistry and Biochemistry Associate Professor Sang Bok Lee teamed up with Materials and Science Engineering Professor Gary Rubloff to build a supercapacitor, a high-power energy storage system that could reduce the costs of electric cars while extending how far they can travel without recharging.

Supercapacitors offer the ability to be recharged almost instantly. They can also discharge energy more quickly than traditional lithium batteries, making them ideal when energy bursts are needed for acceleration and uphill drives. Unlike batteries, the devices do not lose their ability to store charge with age, but they store much less energy than batteries.

Now, Lee and Rubloff have developed a supercapacitor that offers 10 times more capacity than current ones by using metallic nanostructure arrays. Combining Lee's nanofabrication techniques with Rubloff's expertise in atomic layer deposition, the researchers built a device with millions of virtually identical nano-size pores. These microscopic pores increase the surface area for electrically charged ions, vastly improving storage capacity. The researchers plan to launch a company to bring their product to market, and have already filed a patent application on the technology.

The innovation could help energize the electric car industry. When combined with a traditional battery, the nano-array supercapacitor promises to fuel a car further before recharging is needed, making electric cars even more attractive to consumers. Eventually, the supercapacitors could emerge as primary energy sources. "I like to think about how our research contributes not only to science but also to technology," says Lee. "How can it make an impact in our everyday lives?"

TECHNOLOGY: PIONEERING LANGUAGE TRANSLATION

When the military's research arm needed a new program manager last year to shepherd its projects in human language technology, officials at the Defense Advanced Research Projects Agency (DARPA) turned to Professor Bonnie Dorr, Computer Science and the University of Maryland Institute for Advanced Computer Studies. Former co-director of the university's Computational Linguistics and Information Processing Laboratory (CLIP), Dorr has led the development of numerous technologies that translate and summarize written and oral communications, essential research for U.S. Department of Defense (DOD) strategic operations worldwide.

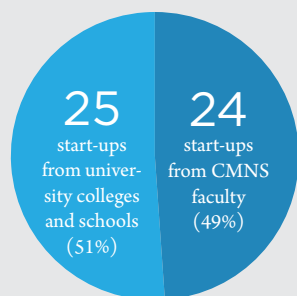
Dorr specializes in semantically informed machine translation. "The goal is to get a machine to truly understand language rather than just give a word-for-word translation that can be stilted or inaccurate," she explains.

VARMA LEADS UNIVERSITY'S TECH TRANSFER EFFORTS

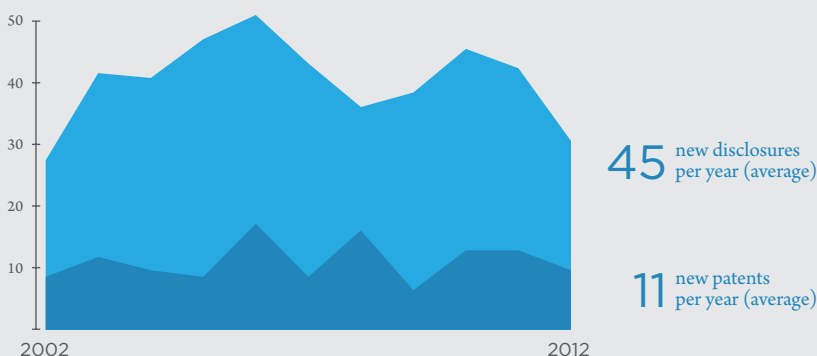
The university's Office of Technology Commercialization is headed by Executive Director Gayatri Varma, Ph.D. '99, molecular and cell biology. Varma joined the office in 1997 as a graduate student to assist with the evaluation and marketing of the university's life science technologies. Working with CMNS, Varma has been instrumental in instituting bimonthly office hours for faculty, staff and students to discuss research, technology transfer, commercialization and patenting processes, and alternative careers. She is a member of the Association of University Technology Managers and the Licensing Executives Society.

Ten Years of Innovation: CMNS Inventions, Patents and Start-ups from 2002-2012*

UMD start-up companies since 2002



Patents issued and disclosures submitted by CMNS faculty



*SOURCE: UNIVERSITY OF MARYLAND OFFICE OF TECHNOLOGY COMMERCIALIZATION. TOTALS REPRESENT CALENDAR YEAR, EXCEPT 2012 IS THROUGH JUNE 30, 2012.



CLOCKWISE FROM LEFT: TAESUN MOON, CLIP POSTDOCTORAL RESEARCHER; BONNIE DORR; DAVID ZAJIC, RESEARCH SCIENTIST AT CASL; MICHAEL WHIDBEY, CLIP GRADUATE STUDENT

In 2009, with colleagues from Johns Hopkins University, Dorr led the development of a system that translates Pakistan's Urdu language to English. She also worked on DARPA's Global Autonomous Language Exploitation program, helping to develop software that analyzes and interprets huge volumes of speech and text in multiple languages. In addition, with her doctoral students, Dorr created Topiary, a summarizer that distills information, and the Translation Edit Rate Plus (TERp), an automatic evaluation metric for machine translation.

On leave at DARPA, Dorr is excited to oversee the next generation of machine translation through initiatives like the Broad Operational Language Translation program, which focuses on getting computers to translate more intelligently, and the Deep Exploration and Filtering of Text program, which is developing the technology to infer unstated information and understand other language nuances. "No matter how many skilled human translators the Department of Defense hires, there is always a need for technology to support worldwide operations," says Dorr. "These sophisticated technologies help us sift through an endless stream of documents in search of information critical to national security efforts."

AGRICULTURE: HELPING ORGANIC FARMERS REAP REWARDS

An interdisciplinary research team is growing much more than eggplants and bell peppers at a university farm in Upper Marlboro, Md. New soil-management practices for organic farming are also blooming. Among their organic research projects is a three-year grant from the U.S. Department of Agriculture National Institute of Food and Agriculture. The scientists are examining how different tillage systems affect crop profitability, soil quality and health, weed containment, pest dynamics and greenhouse gas emissions.

Researchers include Assistant Professor of Entomology Cerruti RR Hooks, whose work with growers has broadened his understanding of their day-to-day practices and concerns. "Farmers typically till the soil to prepare for the new vegetable growing season. To the soil's beneficial organisms, that tillage is like a disruptive earthquake and other natural disasters all happening at once," explains Hooks. "We want to develop a system that will conserve the nutrient-cycling organisms underground while preventing pest and weeds above the soil surface."

“THE GOAL IS TO GET A MACHINE TO TRULY UNDERSTAND LANGUAGE RATHER THAN JUST GIVE A WORD-FOR-WORD TRANSLATION.”

— BONNIE DORR



Creation of that system involves a comparison of a conventional tillage system to no-tillage and reduced-tillage systems. In each case, cover crops are planted because of their beneficial impacts on soil organisms, nutrients and the environment. Their findings will help answer an important stakeholder question: What tillage system type is best to manage the remains of these cover crops when it comes time to plant cash crops? Ultimately, the scientists hope to provide organic farmers with best-management practices that are productive, profitable and environmentally sound.

The research is a collaborative effort with the College of Agriculture and Natural Resources, including Environmental Science and Technology Professor Ray Weil, an expert in using forage radish as a cover crop, and the University of Hawaii at Manoa, the University of Maryland Eastern Shore, and the Department of Agriculture. Hooks has also assembled a dream team of postdoctoral researchers: project leader Lauren Kolb, a specialist in weed science; Mariam Lekveishvili, an expert on mites, used with other organisms as indicators of soil health; and Guihua Chen, an accomplished scientist with expertise in soil quality and greenhouse gas emissions. ■

Hands-on Experience for Budding Life Sciences Entrepreneurs



ALLAN WILL,
B.S. '76, ZOOLOGY

How do you teach undergraduates to turn their innovations into profitable businesses? For successful entrepreneur Allan Will, B.S. '76, Zoology, the answer was to fund a course that equips fledgling inventors with the basic tools needed to pursue venture creation.

“*Special Topics in Entrepreneurship: Entrepreneurship in the Chemical and Life Sciences* fills a niche in providing undergraduate students in the college with the life skills and technology know-how to bring their technologies to market,” says Martha

Connolly, course instructor and director of Maryland Industrial Partnerships (MIPS), which promotes the development and commercialization of products and processes through university/industry partnerships as part of the university's Maryland Technology Enterprise Institute (Mtech).

Students work in teams to create a solution or application to solve a complex problem, developing start-up and business plans. Recent student projects have included software to connect magnetic resonance images to three-dimensional anatomical models; development of a vaccine currently available for licensing; and scaffolding for artificial organs. “You cannot teach people to take risks, but you can give them the skills to succeed,” says Connolly, who brings experts to class to discuss licensing, intellectual property, patents, technology transfer, and financing among other topics of importance to entrepreneurs.

Will, who received his master of science in management at Massachusetts Institute of Technology in 1981, is no stranger to risk taking. Initially Will pursued a career at Abbott Laboratories, but motivated to find better treatments for heart disease when his father was diagnosed with cardiovascular problems, he left to lead a start-up company, DVI (Devices for Vascular Intervention). “When I started working at DVI, there were 16 of us in the office. Three years later we sold the company to Eli Lilly, and five years after that we had grown to 650 people and \$100 million in revenues,” describes Will.

He later served as chief executive officer and/or chairman of numerous medical device companies including AneuRx and Ardina which were acquired by Medtronic, Evalve which was acquired by Abbott Laboratories, and Concentric Medical which was acquired by Stryker. He was also founder, chairman and chief executive officer of The Foundry, a leading medical device incubator where he co-founded 11 medical device companies.

“If you look at the economy and job creation, small businesses are critical to our economic growth,” Will explains. “The challenge in teaching entrepreneurship in the classroom is to get students to think outside the box in a less constrained manner. If you turn a problem on its head, you can make dramatic breakthroughs.”

Will typically returns to campus each spring to review business plan presentations and provide feedback to student groups. “It is critically important that graduates share their experiences with students. If I can provide inspiration to one student by sharing my successes and mistakes, then my efforts are worthwhile. As you move through your career, it is both valuable and rewarding to spend time mentoring others,” says Will, who has also been honored for his efforts mentoring women executives. ■



STUDENTS

CATCH INNOVATION BUG EARLY

TIRED OF MISSING THE SHUTTLE-UM by just moments and anticipating a long wait for the next bus across campus, Eric Rosenberg, B.S. '13, Computer Science, decided to take matters into his own hands. With a team of fellow students, he developed a mobile application that taps into GPS technology to pinpoint the arrival time of the next shuttle. The university's transportation department was so impressed with the Route Rider app that it recently purchased the rights to post a QR code at each Shuttle UM stop to retrieve the up-to-the-minute arrival predictions.

The Maryland campus is the perfect breeding ground for student start-ups like Rosenberg's, offering a collaborative atmosphere, faculty experts and additional business resources. "Both the university and CMNS consistently supported our innovation," says Rosenberg. "Several computer science faculty members gave endless feedback, and the Maryland Technology Enterprise Institute (Mtech) and the Dingman Center for Entrepreneurship provided mentorship."

Putting Start-ups on the Syllabus

A new upper-level elective, *Computer Science Start-ups*, promises to add to the mix, giving students an edge in building companies based on computer applications. "The course not only covers general entrepreneurial skills but also those specific to computer science start-ups, touching on everything from marketing on a shoestring budget to interface design," says Computer Science Professor and former Chair Larry Davis. "We want students to learn to transform an idea for a computer application into a product."

Davis team-teaches the course with three computer science faculty members who have founded start-ups—Professor Ben Bederson, Associate Professor William Arbaugh, and Associate Professor Ramani Duraiswami—as well as Dean Chang, director of Mtech's venture-creation programs. Guest speakers include alumni entrepreneurs and an intellectual-property expert.

"I'm looking forward to sharing some of my 'war stories,'" says Bederson, who co-founded the mobile media company Zumobi. "I've been involved in everything from investment pitches, to hiring, to setting up offices and running a complex engineering team. These are all areas that entrepreneurs need to think about, but they aren't typically covered in a computer science course."

1 Student + 1 Professor = 3-D Audio Camera

Imagine watching a movie where the sound is so immersive you feel you are experiencing each situation shown on screen—whether it is a helicopter hovering overhead, creaking floorboards beneath, or an approaching swarm of buzzing bees. VisiSonics, a venture launched by Duraiswami, who co-teaches the *Computer Science Start-ups* course, and graduate student Adam O'Donovan (B.S. '05, Computer Science; B.S. '06, Physics; Ph.D. candidate, Computer Science) offers the technology to make this feat possible.

Spawned from research conducted at the university's Perceptual Interfaces and Reality Lab, the VisiSonics audio camera uses 64 microphones and five video cameras to create a 3-D soundscape. End-users wear headphones that allow them to be enveloped by sound.

When O'Donovan joined the lab in 2006 under an NSF-funded project, he never expected to spin off a company with a faculty member. "After we made some hardware advancements and demonstrated our work at conferences, it became clear there was market demand," he says. "We decided to take our development to the next level and polish it into a commercial device." NSF's Innovation Corps, or I-Corps program, recently awarded the researchers a \$50,000 grant to help bring their product to market and is also providing training and mentorship.

The state and university have also been instrumental in getting the business off the ground. A \$15,000 grant from the Maryland Technology Development Corporation (TEDCO) helped launch VisiSonics in

"IT'S INCREDIBLY REWARDING TO SEE OUR IDEA TRANSFORM INTO A USABLE PRODUCT THAT COULD AFFECT SO MANY INDUSTRIES."



RAMANI DURAISWAMI (LEFT) AND ADAM O'DONOVAN WITH THEIR REALSPACE™ PANORAMIC AUDIO CAMERA

2009, and a TEDCO loan helped with commercialization efforts. The company is housed on-campus at Mtech's business incubator, which offers business guidance.

The cutting-edge audio camera and associated software have several applications in addition to 3-D sound capture. The technology also visually indicates sound reflections with color bursts, and could be used to help architects design concert halls or automobile manufacturers develop a quieter ride. Another feature allows users to isolate conversations from a noisy setting for security and surveillance purposes. (See www.visisonics.com for product demonstrations.)

Still, O'Donovan's dream is that the entertainment industry will embrace the technology, using it for feature films, video games and concert simulcasts. The Maryland-based producers of the *Blair Witch Project* have already tested it on an eight-minute film project demo. Says O'Donovan, "It's incredibly rewarding to see our idea transform into a usable product that could affect so many industries." ■



DOWNLOAD THE ROUTE RIDER APP FROM THE ANDROID APP STORE, AND LOOK FOR AN IPHONE VERSION IN THE NEAR FUTURE.

TOP TECH COMPANIES HAVE CMNS CONNECTION

GOOGLE. It may be the most famous company with roots in CMNS (co-founded by Sergey Brin, B.S. '93, Mathematics and Computer Science), but it is only one of many successful business ventures created by alumni. In the Department of Computer Science alone, dozens of graduates have launched start-ups that have matured into viable, widely recognized businesses that employ thousands of talented employees in the state, the region and nationwide. Meet five distinguished computer science alumni who are making their mark on the tech world.



ANTHONY CASALENA

WWW.SQUARESPACE.COM

WEB SITE CREATION 101

Launched from a University of Maryland dorm room in 2003 by then 21-year-old Anthony Casalena, B.S. '05, Computer Science, Squarespace has grown into a multi-million dollar business offering software that powers tens of thousands of websites worldwide. For the past three years, *Inc.* magazine named Squarespace one of the 500 fastest growing companies.

It all began when Casalena, frustrated that he could not find a product to help him build his personal website, decided to create his own software. "I began to see it as a viable business opportunity as I met more people who felt that Squarespace solved similar issues for them," he says.

Casalena honed his business skills through the university's Hinman CEOs program, where entrepreneurial-minded students live and learn together. His company recently launched Squarespace 6, an all-new platform that offers mobile-ready template designs and the Layout-Engine page-building system, allowing users to build more complex layouts.



POOJA SANKAR

WWW.PIAZZA.COM

A NEW TOOL TO CONNECT CLASSMATES

The time is 2 a.m., and you are struggling with your college homework. Thanks to the social learning network Piazza, help is just a click away. The brainchild of Pooja Sankar, M.S. '04, Computer Science, Piazza connects classmates and provides an online forum to discuss the sticky points of course assignments.

Sankar's own experiences as an undergraduate at the Indian Institute of Technology spurred the firm's creation. "I would be up all night by myself trying to get my code to compile," she recalls. "It was isolating and frustrating."

Fast-forward to 2009 when Sankar, then a seasoned software developer for Facebook, decided to create a platform to help the next generation of students. She turned to her former instructor, Computer Science Professor David Mount, to test the prototype with his classes at the University of Maryland. Since the product launch in 2011, some 250,000 students at more than 500 schools have used Piazza to connect with classmates.



DAVE BAGGETT

WWW.ARCODE.COM

INTELLIGENT E-MAIL

Dave Baggett, B.S./B.A. '92, Computer Science and Linguistics, is on a mission to make e-mail smarter. An expert in artificial intelligence, Baggett already revolutionized online travel searches with ITA Software, which he and his partners sold to Google in 2011 for \$730 million. Now his Arcode Corporation's Inky e-mail reader, currently in beta tests, promises to help the average person overcome e-mail overload.

"E-mail reader programs to date have all been dumb," says Baggett. "They sort and filter at a very superficial level. Inky understands what the messages are about and ranks their level of importance."

Getting computers to understand human language has long fascinated Baggett, who studied computational linguistics in the doctoral program at the Massachusetts Institute of Technology (MIT). In 1994 he left MIT's Artificial Intelligence Laboratory to join video game company Naughty Dog, where he co-developed the Crash Bandicoot series for Sony Playstation before joining MIT classmates to co-found ITA Software. Says Baggett, "My computer science education at Maryland taught me how to analyze problems logically and mathematically, preparing me to tackle the big problems."



RUVI KITOV

WWW.TUFIN.COM

COMPUTER SECURITY SOLUTIONS

A part-time job building a website for a professor sparked Ruvi Kitov's interest in computer security when he was a freshman, eventually inspiring him to launch what would become the leading provider of security policy management solutions. "I started learning about encrypted communications and secure transactions—which were very new at the time," says Kitov, B.S. '97, Computer Science. "Always a lover of spy novels, I was instantly intrigued." Later, an upper-level course in computer networking further confirmed his interest.

After college, Kitov moved to Israel, landing a job at Checkpoint Software, the leader in the firewall market. In 2003, he and a colleague struck out on their own, launching Tufin. The company's flagship solutions, SecureTrack and SecureChange, help network security engineers at global organizations manage complex systems of firewalls, routers and switches, as well as comply with regulatory standards and prepare for security audits.

"In the early days, we were living on the edge financially and learning on the fly as we built the company," recalls Kitov. Today, Tufin serves more than 1,000 corporate clients worldwide.



JIN KANG

WWW.ISYSLLC.COM

CRIME-SOLVING TECHNOLOGIES

Law enforcement agencies around the world have solved countless crimes thanks to the work of Jin Kang, B.S. '86, Computer Science, and the information technology company he founded, iSYS, LLC. A leader in forensic informatics, iSYS helped develop the FBI's Combined DNA Index System (CODIS), which searches for matches to DNA evidence recovered from a crime scene. The company also specializes in information assurance and is the leading provider of telecom expense management services to the U.S. federal government, which have saved them \$150 million in telecommunications costs to date.

Kang founded iSYS in 1999 after working in software development for defense contractors SAIC and Northrop Grumman. "As a programmer, you often play a small part in building a large application. I wanted to accomplish more," says Kang. "With iSYS, I look at the bigger picture and have a larger impact in the final product." After growing annual revenues to \$24 million, Kang sold iSYS in 2008 to WidePoint Corporation and continues to serve as president of the subsidiary. "My experiences at Maryland were invaluable in helping me succeed in computer programming, which served as a springboard in starting iSYS."

A QUANTUM LEAP IN COMPUTING

On their quest to develop a quantum computer able to perform processing tasks never before possible, CMNS physicists are unraveling the mysteries of quantum mechanics that baffled even Albert Einstein. “A quantum computer won’t simply improve today’s hardware, it would totally revolutionize computing,” says Bice Zorn Professor of Physics Christopher Monroe, who conducts his research through the Joint Quantum Institute (JQI), a partnership between the University of Maryland and the National Institute of Standards and Technology.

The building blocks of a quantum computer would differ radically from a classical computer. A traditional computer is comprised of bits, which can be either a 0 or a 1. But the rules of physics change in the quantum world of atomic and subatomic particles. A quantum computer’s qubits could be a 0 and a 1 simultaneously, according to the quantum theory of superposition. “It would offer the potential for storing and manipulating much larger amounts of memory than conventional computers,” says Monroe.

While it is largely unclear just what doors that power could unlock, one thing is certain: a quantum computer would have major implications for computer security, says JQI Co-Director and Physics Professor Steve Rolston. “It would change all the rules about how our online cryptography works,” he says, by quickly solving the mathematical code that keeps information secure.

Monroe is experimenting with using ions, electrically charged atoms, as qubits. So far, his lab has strung together about 20 of the qubits in a vacuum chamber, but a quantum computer might require millions. To retain their quantum characteristics, these qubits cannot interact with the environment, a task that becomes more challenging as more and more are strung together.

To solve the problem, he is turning to something that sounds like it is straight out of science fiction: teleportation. This quantum principle allows information to be transferred from one place to another without traveling through any physical medium. In 2009, his lab was the first in the world to successfully teleport data from one atom to another. Monroe envisions a quantum computer architecture where strings of 50 qubits or so are connected to each other with photons or light particles. Quantum teleportation would allow the information to move throughout the network. “This is some of the weirdest, goofiest physics you can imagine,” says Monroe, “and it could totally change the future of electronics.”

JQI scientists are tackling another obstacle in quantum computing: high error rates due to fragile quantum systems. In a recent *Nature Communications* article, a JQI team proposes a method for correcting errors by applying electrical pulses to the qubits. “The big problem in quantum computing is that a pure quantum state does not last long,” says team leader Sankar Das Sarma, the Richard E. Prange Chair in Physics and Distinguished University Professor. “This radically new idea promises to keep a quantum state coherent for a long time, so we will have to worry much less about errors.”

Das Sarma is also exploring another method to eliminate the high error rate, using elusive particles, called Majorana fermions, as qubits. These qubits differ from others in that they are topological—allowing them to retain their quantum coherence even when they are perturbed, disturbed, stretched, twisted or otherwise deformed. In 2010, Das Sarma’s team theorized a method for artificially producing Majorana fermions in ordinary semiconductor materials. In another recent *Nature Communications* article, Das Sarma and colleagues propose a method for simplifying and improving the process, making it more practical, and thus bringing physicists even closer to building a quantum computer. ■

“This is some of the weirdest, goofiest physics you can imagine, and it could totally change the future of electronics.”



CHRISTOPHER MONROE

Caring Professor Inspires Corporate Success

When Jim Cramer, host of CNBC's *Mad Money* show speaks, investors listen. In early June, as the economy continued to recover from the Great Recession, Cramer noted: "When economies around the world are slowing, we circle the wagon around recession-resistant companies that can grow even when the economy is terrible here and abroad. Seattle Genetics is one of those companies."

Cramer's guest that day: Clay Siegall, B.S. '82, Zoology, president, chief executive officer and chairman of the board of Seattle Genetics, Inc. (Nasdaq: SGEN), which produces a diverse pipeline of antibody-based therapies for cancer patients. In August 2011, the company's lead drug, ADCETRIS, was approved by the U.S. Food and Drug Administration for use in treating two types of lymphoma patients. In addition, Seattle Genetics

"My goal with this gift is to encourage a professor to focus on students and their career choices just as Dr. Higgins has done so wonderfully for many years."

has a deep pipeline of anti-cancer drugs in clinical development for a wide range of tumor types. Currently, more than 15 targeted therapies are being evaluated in clinical trials using Seattle Genetics' industry-leading antibody-drug conjugate (ADC) technology.

As an undergraduate, Siegall thought about becoming a physician or pursuing an advanced degree in business or science. When his father was diagnosed with cancer his choice became clear: discover and develop more effective cancer therapies. "It was an area where real improvements were needed," says Siegall, who credits the input of Biology Associate Professor William Higgins with key guidance. "Dr.

Higgins was important to my decision making. He explained what research entails, and the time and effort he took with me was critical to my career." Higgins also played an important advisory role for Siegall's older brother, Darren, B.S. '76, Zoology, who became a dentist.

Through an internship at the National Institutes of Health (NIH) in Bethesda that Higgins helped arrange, Siegall became enamored with the power of biomedical research and his commitment to the field was solidified. "To make a difference and to understand what makes cancer cells tick takes a lifelong commitment," says Siegall, whose father was treated at NIH.

After he received his Ph.D. in genetics from George Washington University, Siegall held a postdoctoral appointment for a number of years at the National Cancer Institute, where he discovered targeted cancer therapies before joining the Bristol-Myers Squibb Pharmaceutical Research Institute. "Watching my father's progression with cancer from when I was 19 years old until his death when I was 24 made me acutely aware of the limited tools available to oncologists at the time."

When the Seattle facility of Bristol Myers closed in 1997, Siegall seized the opportunity to co-found a company, and the rest is history. He guided Seattle Genetics from its inception as a small start-up to securing more than \$675 million through public and private financings, including the company's initial public offering in 2001. Since then, the company has forged strategic collaborations with the likes of Bayer, Pfizer, Abbott and the Genentech division of Roche. "I co-founded Seattle Genetics to pursue targeted therapies for cancer patients. I was trained as a scientist but also had to develop skills to run the business of a company while on the job," says Siegall, who serves on the board of directors of Alder BioPharmaceuticals, a private biotechnology company. He has authored more than 70 publications and holds 15 patents.

Throughout his career, Siegall has not forgotten the kindness and knowledge shared by his former professor. "Dr. Higgins really cared about students, he spent a lot of time thinking about what we



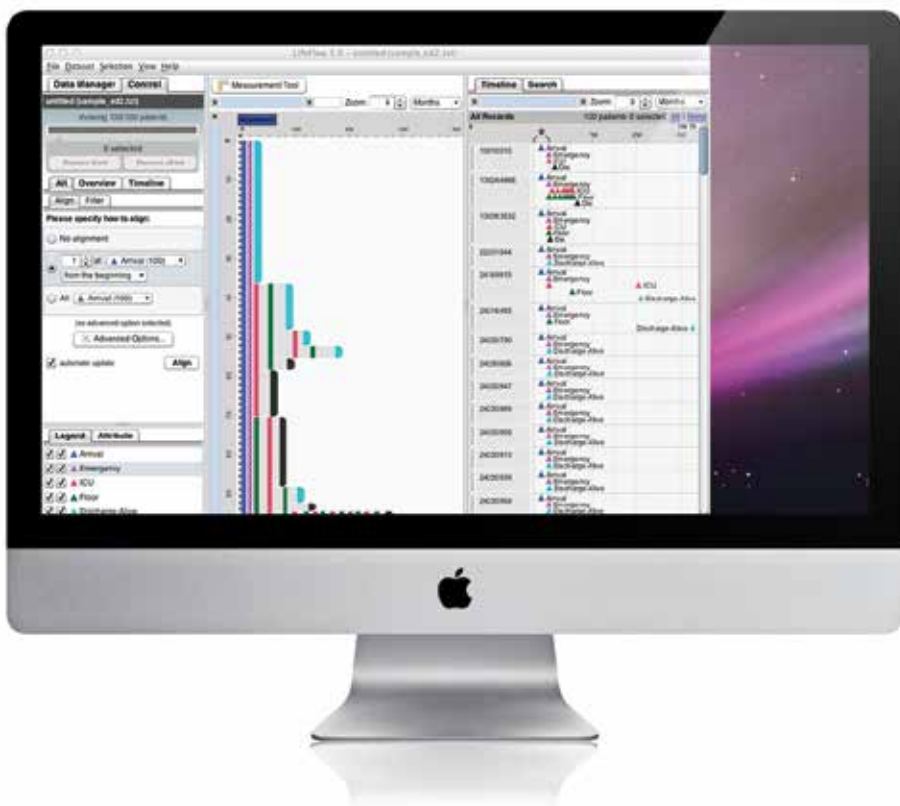
CLAY SIEGALL
B.S. '82, ZOOLOGY

needed to succeed," recalls Siegall. In appreciation, he contributed to the William J. Higgins Endowed Professorship. "My goal with this gift is to encourage a professor to focus on students and their career choices just as Dr. Higgins has done so wonderfully for many years."

As successful as his company has become, Siegall still embraces the work ethic he developed as an undergraduate when he held several jobs to pay for his college education. "When you think you are working hard, step it up to the next level. You can always push yourself a little harder." ■

IF YOU ARE INTERESTED IN SUPPORTING THE WILLIAM J. HIGGINS ENDOWED PROFESSORSHIP OR ANY OF THE COLLEGE'S CURRENT FUNDRAISING INITIATIVES, CONTACT ANDREA MORRIS, ASSISTANT DEAN FOR DEVELOPMENT AND CORPORATE RELATIONS AT AEMORRIS@UMD.EDU.

Researchers Help Doctors Identify Medical Trends

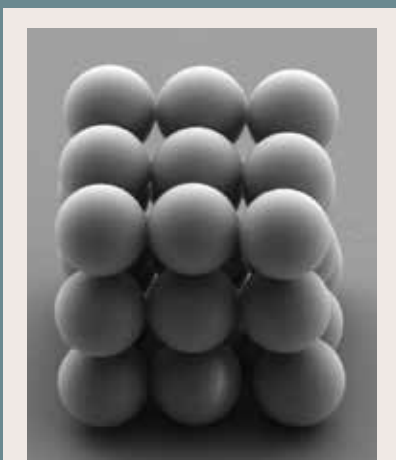


A grant from the Oracle Health Sciences Institute is helping CMNS researchers in the Human-Computer Interaction Lab develop visualization software to quickly spot dangerous drug interactions. The technology lets doctors compare case histories from tens of thousands of patients undergoing long-term medical regimens. Led by Computer Science Professor Ben Shneiderman, the research team's LifeFlow visual analytics software (left) could potentially summarize the medical records of up to 10 million patients on a single screen. "We are committed to expanding the horizons of health IT innovation," says Neil de Crescenzo, senior vice president with the Oracle Health Sciences Institute. "The Maryland research complements our vision of health IT rapidly advancing new treatments and therapies." The software tool is expected to help speed and broaden adverse events analysis, leading to new insights as well as expanded research opportunities. ■

Micro Structures May Accelerate Diagnostics Development

Chemistry and Biochemistry Professor John Fourkas and his research group have developed new materials and nanofabrication techniques for building miniaturized components needed for medical diagnostics, sensors and other applications. The new materials —impossible to make with conventional techniques—would allow for rapid analysis of blood or tissue with small sample volumes.

The materials allow the simultaneous three-dimensional manipulation of microscopic objects using optical tweezers and a unique point-by-point method for lithography. The research, which appears in the August 2012 issue of *Chemical Science*, builds on earlier breakthroughs by Fourkas and his team using visible light for making tiny structures for applications such as optical communications, controlling cell behavior and manufacturing integrated circuits. ■



MICROSCOPIC GLASS BEADS, ASSEMBLED AND GLUED TOGETHER USING LASER BEAMS, MEASURE ONLY ONE-SIXTH OF THE WIDTH OF A HUMAN HAIR. THE BEADS ARE AMONG NEW MATERIALS DEVELOPED BY PROFESSOR JOHN FOURKAS.

Symposium Honors Michael Fisher

The College of Computer, Mathematical, and Natural Sciences, the Institute for Physical Science and Technology (IPST) and the Department of Physics is sponsoring a two-day celebration of the career and scientific contributions of Distinguished University Professor and University System of Maryland Regents Professor Michael E. Fisher, IPST and Physics. The celebration will bring members of the physics, chemistry, mathematics and biophysics community to campus for a two-day symposium on Friday, October 26, from 9 a.m. to 5 p.m., and Saturday, October 27, from 9 a.m. to noon at the Ulrich Recital Hall in Tawes Fine Arts Building on the College Park campus. A Friday evening dinner is planned at the Riggs Alumni Center on campus.

Rooms have been reserved for visitors at the Marriott University College. For more information contact Distinguished University Professor Emeritus and Research Professor Jan V. Sengers at sengers@umd.edu.



Khuller Named Computer Science Chair, Davis to Direct CFAR

Samir Khuller, a professor of computer science, has been named chair of the Department of Computer Science. Khuller, M.S. '89 and Ph.D. '90, Cornell University, is an expert in the theory of computation and is best known for developing algorithms for solving combinatorial optimization problems. He joined the University of Maryland Institute for Advanced Computer Studies (UMIACS) in 1992. From 2004 to 2008, he served as associate chair for graduate education in the computer science department.

Khuller has published some 150 journal and conference papers and several book chapters on his research interests: graph algorithms, discrete optimization and computational geometry. He is a recipient of the National Science Foundation's Career Development Award, several departmental and college teaching awards and a CTE-Lilly Teaching Fellowship. In 2007, Khuller received the university's Distinguished Scholar Teacher Award and a Google Research Award.

Larry Davis, who served as chair of the Department of Computer Science from 2001 until earlier this year, has been named director of the university's Center for Automation Research (CFAR). Davis has made significant contributions in a number of areas: vision, image processing and robotics, including modeling and tracking of people and their activities in videos, understanding of human facial expressions, gait analysis, texture analysis, and robotic path planning.

Davis is a fellow of the Institute of Electrical and Electronics Engineers and the International Association for Pattern Recognition. He served as the director of the University of Maryland Institute for Advanced Computer Studies from 1985 to 1994. Rama Chellappa, former director of CFAR, is the new chair of the Department of Electrical and Computer Engineering in the A. James Clark School of Engineering.



SAMIR KHULLER



LARRY DAVIS

Katz Earns Prestigious Goldwater Scholarship

Harley Katz, B.S. '13, Astronomy and Physics, was selected to receive a Barry M. Goldwater Scholarship, a prestigious national honor awarded to fewer than 300 students this year, recognizing outstanding ability and promise in science, engineering and mathematics.

Katz has engaged in several research projects at Maryland, including work on globular cluster and Newtonian dynamics. He earned a citation from the College Park Scholars Science, Discovery, and the Universe program and also volunteers at the Smithsonian National Air and Space Museum. Katz attended Beth Tfiloh Dahan Community High School in Baltimore and plans to pursue a doctorate in astrophysics, focusing on gravity theory and the high redshift universe.



HARLEY KATZ

FACULTY HIGHLIGHTS

Ashok Agrawala, Computer Science and University of Maryland Institute for Advanced Computer Studies (UMIACS), received the Wireless Foundation's Achievement Award at its 18th Annual Achievement Awards Dinner in Washington, D.C., this summer. Agrawala was also selected as the recipient of this year's Technology Champion of the Year Award by the National Organization of Black Law Enforcement Executives. Both awards recognized the development of the Escort-M program, a mobile phone application that will link public safety personnel to real-time video and audio from a student's phone.

A special session recognizing the immense contribution made to the field of high-grade metamorphism and partial melting by **Mike Brown**, Geology, will be held during the Granulites & Granulites 2013 conference, January 16-20 in India. Brown is a keynote speaker at the conference.

A new study by an international team of scientists led by **Rita Colwell**, Center for Bioinformatics and Computational Biology and UMIACS; Claire Fraser, Institute for Genome Sciences (IGS) at the University of Maryland School of Medicine; and CosmosID Inc., College Park, has found that two distinct strains of cholera bacteria may have contributed to the 2010 Haitian cholera outbreak. The team published its results June 18, 2012 in the *Proceedings of the National Academy of Sciences*.

Catherine Fenselau, Chemistry and Biochemistry, was selected by the Chemical Heritage Foundation and the American Society for Mass Spectrometry for inclusion in an archive of oral histories of scientists who have led the development of mass spectrometry for chemistry and biochemistry. Two days of interviews and videotaping are being edited for inclusion in the permanent archive at the Chemical Heritage Foundation.

Eugenia Kalnay, Atmospheric and Oceanic Sciences, Earth System Science Interdisciplinary Center (ESSIC) and the Institute for Physical Science and Technology (IPST), has been selected as the 2012 Lorenz Lecturer by the Nonlinear Geophysics Focus Group of the American Geophysical Union in recognition of her contributions to nonlinear geophysics.

Sujay Kaushal, Geology and ESSIC, has been awarded the 2012 International Recognition of Professional Excellence prize, which honors a young ecologist who has published uniquely independent, original and/or challenging research representing an important scientific breakthrough.

Karen Lips, Biology, received the IUCN SSC Amphibian Specialist Group's 2012 Sabin Award for Amphibian Conservation, administered by Conservation International, in recognition of the significant contributions

ALUMNI HIGHLIGHTS

Sonify Biosciences LLC, founded by **Miriam Boer**, Ph.D. '11, Biochemistry, was a winner in the Maryland Technology Enterprise Institute's (Mtech) 2012 University of Maryland \$75K Business Plan Competition. Sonify Biosciences is developing a novel melanoma treatment based on non-chemical, non-ablative ultrasound technology.

Justin Cohen, B.S. '91 and M.S. '93, Physics, has been promoted to executive vice president, managed services for Partners Consulting in Buena Park, Calif. He has overall responsibility for business development, marketing, applications development and support, integration services and infrastructure outsourcing. Prior to joining the company, he founded and built a software consultancy firm, which was acquired by Partners in 2006.

Namita Dhallan, B.S. '89, Computer Science, is executive vice president of product strategy and engineering for Deltek in Herndon, Va. Dhallan is responsible for managing market and product strategy for Deltek's global software and hardware product lines. Previously, she served as chief product officer and group vice president-product management at JDA Software Group, responsible for corporate product strategy and direction.

Tobin Marks, B.S. '66, Chemistry, has been elected a member of the National Academy of Engineering (NAE) for innovation in electronic, photonic and photovoltaic materials and catalytic polymerization. Marks received the 2012 NAS Award in Chemical Sciences for groundbreaking contributions to understanding the structure and function of catalysts useful in the production of environmentally friendly plastics and new materials. A recipient of the 2011 Dreyfus Prize in the Chemical Sciences, Marks is the Charles E. and Emma H. Morrison Professor of Chemistry, Professor of Materials Science and Engineering, and Vladimir N. Ipatieff Professor of Catalytic Chemistry at Northwestern University.

Charles Steinberg, B.S. '80, Zoology, is senior advisor to Boston Red Sox president and chief executive officer Larry Lucchino. Previously, he managed public affairs for the commissioner of baseball and was executive vice president, public relations and marketing for the Los Angeles Dodgers.

William Wallace, B.S. '76, Biochemistry, is one of 97 outstanding mathematics and science teachers to receive the Presidential Award for Excellence in Mathematics and

Science Teaching. Wallace teaches at the Georgetown Day School in Washington, D.C.

Cameron K. Weiffenbach, M.S. '68, Chemistry, is an intellectual property lawyer at Miles & Stockbridge in the Washington, D.C., area. Previously he served as counsel in McDermott Will & Emery LLP's Washington office and was a member of the firm's intellectual property, media and technology department. He held various positions during a more than 30-year career with the United States Patent and Trademark Office.

Nam-Sung (Stephen) Woo, Ph.D. '83, Computer Science, is president and general manager for System LSI Business, Samsung Electronics Device Solutions. Woo joined Samsung Electronics in 2004 as executive vice president and head of its Mobile Solution Development division. He served as head of its SOC Research and Development and general manager before his current appointment. Prior to joining Samsung Electronics, he served in several senior management positions at Texas Instruments. ■

she has made in advancing understanding of the regional impact and broader implications of the amphibian chytrid fungus, which poses one of the most pressing threats to the survival of amphibians worldwide.

A research team led by **Jun Yan**, Physics; **Michael Fuhrer**, Physics and the Institute for Research in Electronic and Applied Physics (IREAP); and **Dennis Drew**, Physics, has developed a new type of hot electron bolometer using bilayer graphene that can detect infrared light. The bolometer can be used in a wide range of applications including airport security screening, medical imaging and the study of the universe through improved telescopes. The team published their findings in the June 3, 2012, issue of *Nature Nanotechnology*. ■

IN MEMORIAM

ROGER BELL

Emeritus Professor Roger Bell, 76, died on July 1, 2012. After receiving his Ph.D. in 1961 at the Australian National University and serving as a lecturer in Australia, Bell joined the university's Astronomy Program, which he directed from 1987 to 1991. During his career, he also served as program director at the National Science Foundation and secretary of the American Astronomical Society. He became professor emeritus in 1998. Bell, who supervised the doctoral dissertations of 18 Maryland students, led the development of the calculation of late-type stellar spectra and colors and pioneered the application of that art to solve important problems in stellar, galactic and extragalactic research, which is described in some 160 articles.

RUTH DAVIS

Ruth Davis, M.A. '52 and Ph.D. '55, Mathematics, one of the first women to receive a doctorate in mathematics from Maryland who later helped design some of the earliest computers and satellites, died March 28, 2012. Davis, 83, was president and chief executive officer of The Pymatuning Group, Inc., a small technology management company established in 1981. She also served as deputy undersecretary of defense for research and advanced technology; assistant secretary of energy for resource applications; and the first director of the National Center for Biomedical Communications in the Department of Health, Education and Welfare. She was named the CMPS Distinguished Alumna in 2004 and the Mathematics Distinguished Alumna in 2003. She was inducted into the university's Alumni Association Hall of Fame in 2000 and received the President's Distinguished Alumna in 1993. Davis endowed the Ruth M. Davis Professorship in Mathematics.

ANITA FRAZER

Anita Forch Woods Sherman Frazer, 97, wife of the late G. Forrest Woods, a former professor and chair of the Department of Chemistry who was recognized for his work on antimalarials, died on August 29, 2011, leaving part of her estate to the department. Frazer previously made a \$1 million gift in honor of her husband to the department: \$500,000 for undergraduate scholarships and \$500,000 for the construction of the G. Forrest Woods Atrium in the Chemistry Building. "She was interested in creating a space for students to congregate—to sit or study for class," says Chemistry Professor Philip DeShong, who remained friends with Frazer. "As her husband was fond of saying, 'More students learn chemistry



over a cup of coffee than they ever learn in the classroom."

DeShong describes Frazer as "a wonderful generous person" who was known for her love of butterflies and the butterfly pins she wore for decades. Well into her 90s, she played golf and, until months before her death, drove to a weekly Sunday brunch with friends. Judi Short, niece of Frazer, recalls the respect her aunt and uncle had for the University of Maryland and how they enjoyed entertaining students and faculty. "What a grand gesture for her to donate part of her estate to the university," says Short. ■



ANITA FRAZER AND C.D. MOTE

ODYSSEY

Odyssey is published twice a year for alumni, friends, faculty, staff and students of the College of Computer, Mathematical, and Natural Sciences.

Alumni notes are welcome. Please send them to *Odyssey*, CMNS Dean's Office, University of Maryland, 2300 Symons Hall, College Park, MD 20742. Send information by fax to 301.314.9949 or by email to mkearney@umd.edu.

Editor: Nancy Grund
Senior Writer: Beth Panitz
Editorial Associate: Mary Kearney
Designer: Loretta Kuo

DEPARTMENTS, CENTERS AND INSTITUTES

Department of Astronomy
 Department of Atmospheric and Oceanic Science
 (formerly Meteorology)
 Department of Biology (formerly Zoology)
 Department of Cell Biology and Molecular Genetics
 (formerly Microbiology)
 Department of Chemistry and Biochemistry
 Department of Computer Science
 Department of Entomology
 Department of Geology
 Department of Mathematics
 Department of Physics

Center for Bioinformatics and Computational Biology
 Center for Scientific Computation and
 Mathematical Modeling
 Earth System Science Interdisciplinary Center
 Institute for Physical Science and Technology
 Institute for Research in Electronics and Applied Physics
 Institute for Advanced Computer Studies
 Joint Quantum Institute
 Joint Space-Science Institute
 Maryland Cybersecurity Center
 Maryland NanoCenter
 Maryland Pathogen Research Institute
 National Socio-Environmental Synthesis Center (SESYNC)



COLLEGE OF
COMPUTER, MATHEMATICAL,
& NATURAL SCIENCES

University of Maryland
2300 Symons Hall
College Park, MD 20742



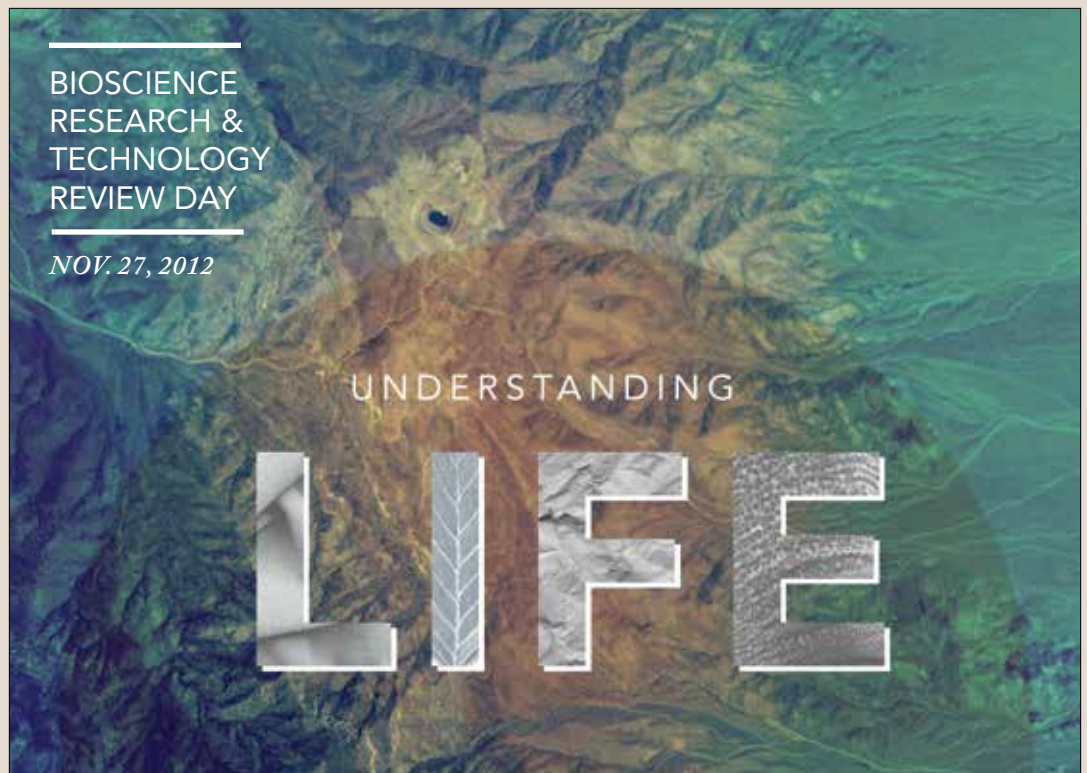
SAVE THE DATE
NOV. 27, 2012

Boost Your Bioscience IQ

Join faculty, students, alumni and representatives from business, industry and federal agencies for Bioscience Day 2012 on November 27 from 9 a.m. to 6 p.m. in the Stamp Student Union. Learn more about the latest advances in bioscience and biotechnology and potential academic-industry-government collaborations. L. Mahadevan, professor of physics and organismic and evolutionary biology and a core member of the Wyss Institute for Biologically Inspired Engineering at Harvard University, will present "On Growth and Form—A Physical Basis for Morphogenesis." For more information, visit www.bioscienceday.umd.edu.

BIOSCIENCE
RESEARCH &
TECHNOLOGY
REVIEW DAY

NOV. 27, 2012



CONNECT
WITH THE COLLEGE



*Curious about your former classmates?
Interested in learning more about the college's latest research initiatives?
Ready to attend an alumni event?*

Reconnect today with the College of Computer, Mathematical, and Natural Sciences! Join our Facebook or LinkedIn groups, or become a member of the CMNS Alumni Association Chapter. We look forward to hearing from you! Visit us at www.cmns.umd.edu.



FEAR THE
TURTLE