COVER STORY:

‘Fit to Ride’

ALSO INSIDE: DIPLOMATS IN TRAINING • ANALYSIS OF BLACKJACK
Enlightenment and Solutions

The remarkable range of expertise put to use daily by the faculty and students at Old Dominion University pumps up the economy and helps to shape the culture of our region. A key goal of my administration is to make sure that our education specialists, scientists, artists, economists and engineers have ample opportunities to share this expertise and make positive contributions to the quality of life of Virginians.

To maximize this sharing of knowledge and skills, I and others in the administration and staff are redoubling our efforts to get out the good word about this university’s bountiful offerings: Old Dominion University is a source – in myriad fields – of enlightenment and solutions.

Prospective students and tomorrow’s leaders need to know this. Today’s government decision makers do, too, as well as leaders in business and industry.

Quest magazine can help us spread this good news about Old Dominion. The article topics in this issue range from international relations to medical modeling and simulation, from research grant writing to statistics and probability, from nanotechnology to social media. In other words, a lot of enlightenment and solutions can be found on the following pages.

Note also the cover story about the impressive accomplishments of Danielle Rowland, who was awarded a doctoral degree in physical therapy from our College of Health Sciences in May. (I should point out, as well, that Ms. Rowland also received her bachelor’s degree in physical education and exercise science from Old Dominion’s Darden College of Education in 2007).

Her career is just beginning, but this young woman has already created a program she is calling “Fit to Ride” to market fitness and rehabilitative services for the equestrian athlete. To do this Ms. Rowland has called upon her world-class performances as a dressage competitor, as well as her excellent training at Old Dominion. I know our physical therapy faculty, including Martha Walker and Gail Grisetti, who provided commentary for the Quest article, are very proud of Ms. Rowland. I am, as well. She is making a positive contribution to the quality of life of Virginians.

J.R. Broderick
President
Comment: Tracing Disasters Through Digital Culture

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Tracing Disasters Through Digital Culture

BY LIZA POTTS

From Nov. 26 through 29 of 2008, sleep was not an option. During the takeover of the Taj Mahal hotel, the atrocities at the Nariman House and numerous bombings, social media participants were desperately trying to locate the missing, catalog the dead and circulate validated information during the terrorist attacks in Mumbai, India. Early in this disaster, CNN and other major news networks relied heavily upon participants in Twitter who were distributing content about events on the ground in Mumbai, reaching an audience of millions through their Tweets.

Social media is an interactive space where participants share data, validate content and spread information. As the Web’s passive spaces have evolved into active, social media, the prospect of extending these sites into places where bystanders, victims, family and friends can reach out to one another is not only needed but demanded by these participants.

We cannot simply rely on search engines such as Google to locate information and break news for us. Simply put, Google’s Search Engine Optimization (SEO) techniques rely on inbound links, outbound links and placement of keywords. While this can help us track down established websites, most search engines are not effective systems for locating and triangulating information in response to emerging issues or specific details regarding the volatile and unpredictable nature of disasters. Instead, many online participants turn to social software tools such as Twitter, Wikinews, Flickr, Facebook and others.

Spanning time zones, cultures and laws, social media has reached a tipping point in terms of participation, knowledge distribution and technological advancements. Whether it is a mother trying to locate her son after the London bombings of July 7, 2005, families using Craigslist to find a missing grandfather in New Orleans, or students using Facebook to share information after the Virginia Tech massacre, social media can be an important tool for people desperate to communicate. When we look across these disasters, patterns emerge that give us insights into how people use social media in general and what sorts of information they are trying to share during these events.

Once we have acquired information, how do we confirm that it is or is not accurate and factual? Validating content is a constant concern in social media, as people can accidently pass along inaccurate information or – worse still – some nefarious users can circulate inaccurate information on purpose. This is where moderators come into play. These are people who voluntarily organize social media content – whether it is guiding other Twitter users by creating hashtags, building new communities on Facebook or creating photo pools on Flickr. As one example, during the Iran election protests in the summer of 2009, overwhelming numbers of Twitter participants used this tool to overwhelm the inaccurate content by re-Tweeting accurate content and pointing out the agitators.

Research can improve the design of these systems, government communication processes and efforts made by relief organizations. The technology to do
so is available today, and we are certainly culturally advanced enough to implement these improvements.

The assault on Mumbai was an epoch moment for social media use. A participant was faxed a list of victims known to be at a local Mumbai hospital, which she then distributed to volunteers via Twitter. These volunteers typed up these details into a Google Doc spreadsheet, allowing them to take the fax's data and redistribute it back to the community as validated content. Other participants could then view this publicly available document to confirm these details, using the various columns to validate victims' names, age and status.

Yet, unfortunately, many of these social media sites have the same problem today as they did during the Indian Ocean earthquake/tsunami in 2004, where over 200,000 people were missing and presumed dead. Numerous websites were employed to try to coordinate details about the missing, in multiple languages across many disparate systems. These systems provided no sense of unity in user experience or in data sharing.

Finding accurate answers was not a likely scenario for the hundreds of thousands of friends and relatives of the lost. Similarly, after the recent earthquake in Haiti, there were multiple missing persons systems collecting disparate content, walled off from each other and without much ability for participants to edit this information for accuracy.

Tracing these connections help us improve the current systems designs and plan new communication tools to better equip these participants during these difficult times. Learning from past experiences can also inform government officials and non-government organization leaders on how to best distribute emergency content during these events.

Right now, people are cobbling together whatever resources are available online in order to get by and communicate during horrific events. As participation across these systems reach tipping points in terms of participation and media awareness, people will find more methods to communicate and share information. The solutions will be in how we provide ways for them to be active participants, how well the media, government agencies and relief organizations cooperate with these participants to further distribute information about key sites of activity, and how empowered moderators feel to create their own spaces for communities to meet and exchange details.

Liza Potts, an assistant professor of writing, culture, and technology, joined Old Dominion University in 2008. She studied technologically mediated communication and systems usability at Rensselaer Polytechnic Institute, where she received her Ph.D. in communication and rhetoric (2007). Potts has been active in the software and Internet industries since 1994, working for Microsoft, NBC/Universal, Independence Blue Cross and FordDirect. Her current research interests include technologically mediated communication, participatory culture and experience design. She is associate editor of The Poster, an academic journal focused on visual rhetoric and is co-director of the CeME Lab (Investigating Mediated Experiences @ ODU). To see the CeME Twitter feed, go to ceme.digitalodu.com.
Linda Irwin-DeVitis, former dean of the Lounsbury School of Education at Georgia College & State University (GCSU), has become dean of Old Dominion University's Darden College of Education. Provost Carol Simpson announced the appointment in March 2010, effective June 25.

Irwin-DeVitis succeeds William Graves, who is retiring after leading the college for nine years.

“Dr. Irwin-DeVitis is a highly accomplished academic administrator, who brings a record of successful leadership, has a wide range of hands-on classroom experience, and is very familiar with education program accreditation requirements,” said Simpson. “She will be a terrific asset to the college’s goal of becoming one of the top 50 education schools in the country.”

Dean at GCSU since 2003, Irwin-DeVitis has spent more than 40 years in the education field. During her tenure, the GCSU School of Education was awarded the 2008 Wisniewski Award by the Society of Professors of Education and was a finalist for the 2009 National Christa McAuliffe Excellence in Teaching Award.

She previously served as associate dean for programs at the University of Louisville College of Education and Human Development and held faculty positions at SUNY Binghamton and Oneonta and the University of Tennessee. Additionally, she spent 10 years as a middle and high school teacher in rural school districts in Florida and Louisiana.

Irwin-DeVitis is the co-author of two books, “50 Graphic Organizers for K-8 Classrooms: Templates and Strategies” and “Graphic Organizers: Strategy for Authentic Learning,” and co-editor of the book series “Adolescent Cultures, School and Society.” Additionally, she is co-editor of “The Adolescent Education: A Reader,” published in the spring of 2010. She has written numerous articles for a variety of refereed publications, including the English Journal, Journal of Adolescent and Adult Literacy, Journal of Educational Studies, Middle School Journal and Reading Research and Instruction, among others.

She has served as the principal or co-principal investigator on a number of research grants, including a $1.24 million U.S. Department of Education grant for a teacher recruitment and retention transition to teaching project and a $2.1 million DOE service grant with the Binghamton City School District to increase preparation for and interest in postsecondary education.

Irwin-DeVitis holds a bachelor's degree in secondary education and a doctorate in education from the University of Tennessee, and received a master's degree in curriculum and instruction from the University of New Orleans.
Blue Crab Bowl, Science and Technology Competitions Bring Hundreds of State’s Brightest Students to ODU Campus

A team of ocean science whiz kids from Bishop Sullivan High School in Virginia Beach swamped the competition Saturday, March 6, to win the school’s third straight Blue Crab Bowl. The annual event was for teams from throughout Virginia and was the first of three such events that brought very bright young students to the Old Dominion University campus in spring 2010.

Senior Christine Chesley, in her fourth year as a member of the Bishop Sullivan team and in her second year as the team’s captain, led the victors to one lopsided victory after another in the double elimination competition.

Bishop Sullivan defeated Grafton High School 87 points to 36 in the final round before an audience of more than 200 in the Batten Arts & Letters Building auditorium. Grafton, which finished second, defeated St. Christopher’s School of Richmond (fourth place) and the Chesapeake Bay Governor’s School of Warsaw (third place) to reach the finals.

The Bishop Sullivan march to victory impressed Richard Zimmerman, chair of the ODU Department of Ocean, Earth and Atmospheric Sciences, who was a judge for the event. “I did the first round with Bishop Sullivan this morning and they didn’t let the other team answer even one toss-up question,” Zimmerman said.

Victoria Hill, a research assistant professor of ocean, earth and atmospheric sciences at Old Dominion, was a coordinator for the event. She said more than 40 ODU faculty members, staffers and students served as Blue Crab Bowl volunteers.

The bowl kicked off a series of weekend events that brought hundreds of the brightest high school and middle school students in the state to the ODU campus, and kept dozens of ODU volunteers busy. The Tidewater Science Fair attracted 350 students on March 13 and the Virginia State Science and Engineering Fair April 2-3 drew 300 students.

M.B.A. Program’s Global Management Emphasis Cited by Princeton Review

The Princeton Review has recognized Old Dominion University’s M.B.A. program among the top 15 in the nation for its global management emphasis.

In its “Student Opinion Honors for Business Schools” listing, the Princeton Review cited the top graduate business schools, as rated by some 19,000 students who evaluated their program’s preparation in specific categories. The listings included the top 15 schools in each of six different emphasis areas, including global management, accounting, finance, general management, marketing and operations.

“This recognition is affirmation of our emphasis on a global perspective in all our programs,” said Nancy A. Bagranoff, former dean of ODU’s College of Business and Public Administration. (She became dean of the University of Richmond School of Business in mid-2010.)

“With one of the most diverse campuses in Virginia and a thriving international community, Old Dominion is uniquely positioned to offer our students the academics and experience that give them an advantage in the global marketplace.
Dayanand Naik, professor of mathematics and statistics at Old Dominion University, has been elected a 2010 Fellow of the American Statistical Association (ASA), an honor bestowed annually on no more than one-third of 1 percent of the association’s membership.

Naik, who joined the ODU faculty in 1985, has research interests in multivariate statistical analysis, linear models, regression diagnostics, longitudinal data analysis and bioinformatics.

“An award of this fellowship is a testimony to the honoree’s very high standing in the statistical community in terms of research and leadership, and an acknowledgment of his contributions to the betterment of the profession,” said Mark Dorrepaal, chair of the Department of Mathematics and Statistics.

Chris Platsoucas, dean of the College of Sciences, called Naik’s election a “tribute to his contributions to the field of statistics, and reason for the department, the college and the university to be proud.”

The Fellow’s award will be presented to Naik in August 2010 in Vancouver, British Columbia, during the annual Joint Statistical Meetings awards ceremony.

One recent research project of Naik’s explored how changes in gene expression levels can help characterize cancers. The project, “Computational Proteomics: Algorithms for Classifying Prostate Cancer,” made use of the protein signatures of mass spectra to classify prostate fluid samples into categories of health, early prostate cancer, late prostate cancer and benign prostate hyperplasia.

ODU faculty members hold 75 fellowships in professional associations and societies in the United States and abroad.
Roland Mielke Appointed First Chair of Modeling, Simulation and Visualization Engineering Department

Roland Mielke, a professor of electrical and computer engineering in Old Dominion University’s Frank Batten College of Engineering and Technology (BCET), has been appointed chair of ODU’s new Department of Modeling, Simulation and Visualization Engineering. BCET Dean Oktay Baysal recommended the appointment, which subsequently was approved by Provost Carol Simpson.

Mielke, who joined the university in 1975, has a long and distinguished academic career. “Among the testimonials to his success, he was designated as a University Professor at ODU in 2002 and has been certified as a Modeling and Simulation Professional by a national board,” Baysal wrote in recommending Mielke for the position. “He has been one of the key individuals in building the success of the Department of Electrical and Computer Engineering (ECE) as well as the Virginia Modeling, Analysis and Simulation Center (VMASC).”

Mielke has previously served as ECE department chair for 15 years, and has served as both technical director and interim director of VMASC. Mielke, who is also director of the Engineering M&S Graduate Program, is excited about the possibilities this new program creates for ODU.

“I am looking forward to working with the many individuals who will be a part of the new department or who will partner with the new department,” he said. “Old Dominion University is recognized as one of the world leaders in modeling and simulation education and research; we must strive to continue and expand this leadership position.”

The new department was created as part of an impressive period of growth in modeling and simulation education at the university. With the creation of an M&S engineering undergraduate program, ODU is the only school in the United States that offers a complete advanced education in the discipline, from undergraduate to postdoctorate.

Mielke said that in spring and summer 2010, the new department will address curriculum and course development for the new undergraduate program, create a department website, establish a student advising capability and prepare promotional and advising materials.

“In addition, we will devote considerable time and effort to develop a research agenda that is closely tied to and supports the activities of VMASC,” Mielke said, “and to develop close working relationships and partnerships with local modeling and simulation companies and organizations.”
Breathing heavily, struggling under the weight of her 44-pound pack, the test subject shoulders her modified M-4 rifle. She’s on the hunt for human targets. One at a time, outlines of human forms appear on a computer-generated backdrop. The woman fires a laser beam from the gun, aiming at the center of the target’s chest. Every few pulls of the trigger she pauses to check her heart rate from the device on her wrist, which she reads off to tester Courtney Butowicz. A dozen shots later, the test subject places the gun down carefully. It’s time to run again.

This is no soldier being trained. The test subject is an Old Dominion University student. Nine weeks earlier, she was one of a few dozen volunteers who navigated the same shooting course—firing the modified weapon at a series of targets four times—interspersed with running 200 meters within 60 seconds—wearing a helmet, body armor and a military-style backpack with a total weight of 66 pounds for men, 44 pounds for women.

As you’d expect, the strenuous exercise isn’t a recipe for precise shooting. But that’s not the point.

The multidisciplinary research team—consisting of experts in engineering, modeling and simulation, biomechanics and exercise physiology—then put the test subjects through a nine-week course of strength and fitness training. After the training period, the subjects do the shoot-then-run-then-shoot-again test. The testers use the shooting simulation, along with several other fitness assessments, to track improvements in performance after the training regimen.

“Fitness is a huge factor for performance in the field for our soldiers, but there hasn’t been a great deal of research into what works and what doesn’t when it comes to fitness and performance,” said Stacie Ringleb, assistant professor of mechanical engineering at ODU’s Frank Batten College of Engineering and Technology, and the primary investigator for this study.
The shooting task, especially wearing the heavy vest and backpack, simulates some of the physical strain soldiers could face in combat. Ringleb said together with the workout regimen, it’s designed “to develop a model to help us understand how fitness affects tactical performance in the military.” The fitness study is currently funded by the Office of Naval Research’s Human Performance Training and Education Program.

The virtual-reality shooting simulator, called CAPTURE (Cognitive and Psychological Testing Urban Research Environment) was developed during a Phase I Small Business Innovative Research Grant, using technology pioneered by a woman-owned small business called VRR. It’s one of a handful of studies Ringleb and her team have performed using the Motion Analysis Lab at Old Dominion University’s Student Recreation Center.

The common theme for the studies addresses the question: how can researchers use modeling and simulation to improve human performance?

Ringleb co-leads the Medical and Health Care Modeling, Simulation and Visualization Cluster at ODU’s Virginia Modeling, Analysis and Simulation Center (VMASC).

MS&V researchers across many disciplines at ODU are taking the same approach as Ringleb. And as a result, the school has developed a stable of modeling and simulation expertise about the human body.

Not just doctors and nurses

When people think of modeling and simulation, they often visualize flight simulators or medical simulations.

John Sokolowski, VMASC executive director, said virtual-reality MS&V techniques are invaluable in traditional medical fields. But he added that researchers at ODU have tried to go further.

“Modeling and simulation, from the user perspective, is a tool that can address problems in all kinds of areas,” Sokolowski said.

“When we talk about this area, we really need to refer to it as medical/health care modeling, because there’s a difference. Medical MS&V is your doctors and nurses. But modeling and simulation can also address issues of cost and safety in the medical/health care field.”

It might be disease specialist Holly Gaff, assistant professor of community and environmental health in the College of Health Sciences, modeling the behavior of diseases. In 2008, Gaff received a $500,000 grant from the National Institutes of Health to support her innovative research, which uses mathematical modeling to study human monocytic ehrlichiosis, an emerging tick-borne disease.

Sokolowski himself worked as part of a team to simulate the evacuation of Naval Medical Center Portsmouth in the event of a catastrophic flood.

In fact, Mark Scerbo, professor of psychology and a human factors expert, and co-leader of the Medical and Health Care MS&V Cluster, said the fact ODU doesn’t have a medi-
Scerbo, whose background in human factors research came through the study of aviation, said ODU researchers were invited by EVMS to analyze some of the first training simulators the medical school had purchased. “They said, ‘We want to make sure they’re learning the right things before we invest a lot of money in these simulators.’”

ODU researchers evaluated the machines, found one to be pretty good as a training simulator, “but the other one, we found that if you trained on it, you were less prepared to see a patient than if you had trained on a rubber arm. It was that bad,” Scerbo said.

That led ODU researchers to look at the landscape of all simulation devices used in medicine. At the time, only about 3 percent of procedures could be tested with a simulator. “So we started to take a look at what was missing, and started to develop new systems that would target important needs in training that the commercial vendors did not address,” Scerbo said.

“And then, it became very clear to me once we got involved in this, unlike aviation, which is heavily invested in simulation for both training and research, there is no laboratory for researching how medicine is practiced.”

Maximizing human performance

Ringleb’s research is aimed at human performance modeling – for treatment, rehabilitation and patient care.

In addition to the shooting and running study, Ringleb has done research with the ODU women’s soccer team, testing reactions to the virtual-reality image of a ball rolling past in different directions. That research is an effort to optimize athletic performance, but also to study what predisposes female athletes to knee ligament tears, and create training strategies for how to prevent them.

Human performance modeling has an enthusiastic client in the various branches of the U.S. military in Hampton Roads.

“The traditional method of simulation in the medical and health care area is training people on mannequins – how to perform procedures. Everything we do here is beyond that. Nobody’s really looking at it the way that we look at it,” Ringleb said.

Ringleb is also working on a study to use virtual-reality assessment tools to determine a soldier’s readiness to return to combat, and is helping to create an Internet-based rehab protocol for soldiers who have hearing loss due to blast or traumatic brain injury.

“Everyone else looks at modeling and simulation as a tool. In our approach, we look at it as a discipline. We have this whole core of medical and health care expertise within the discipline of modeling and simulation, and look at all the ways we can apply it.”

Modeling the components of human health

While some researchers practice MS&V on a large scale, perhaps studying mass evacuations, pandemics and operating room efficiency, Mohammed Ferdjallah, a research associate professor at VMASC and co-leader of the Medical and Health Care Cluster, has to work on a smaller scale.

The associate professor of electrical and computer engineering is interested in modeling organ systems and biophysical phenomena, about which little is known. “For instance, a particular interest of mine is to model the electrophysiology of muscle fibers,” Ferdjallah said.

Muscle is a bundle of fibers grouped together into functional units referred to as motor units, but Ferdjallah wants to better understand how each muscle fiber contributes to the overall force generated by the muscle.

“It’s nearly impossible to measure the single-fiber action potential without invasive means,” he said. “You can measure it with an invasive needle electrode, and look very specifically at the local muscle fibers, but even then you can’t have a global picture of how the muscle fibers work together.”
“But if you create a muscle model, and you fit the model to data collected from single muscle fibers, one could work backwards to generate a model that recreates the actual physical phenomenon.”

The goal of muscle models is to understand muscle changes during aging and space flights and design therapeutic interventions that could be tested on these models. The possibilities of this research are limitless, Ferdjallah said. With similar thinking, it might be possible to map cellular phenomena that occur in the brain, the liver, the kidney or the pancreas, things that can’t easily be studied in living patients.

Sokolowski said that’s what ODU’s researchers are keen to do – take that body of MS&V research in medicine and health care and move it forward to previously unexplored areas.

“John Sokolowski Named VMASC Executive Director

John Sokolowski, a leading national scholar and researcher in the fast-growing field of modeling and simulation, was named executive director of Old Dominion University’s Virginia Modeling, Analysis and Simulation Center (VMASC) in March 2010.

With the appointment, Sokolowski assumes a primary role in developing an M&S industry that is a significant new driver of economic development in the state. He was selected after a high-profile search by a committee composed of ODU administrators, faculty and M&S industry executives.

ODU President John R. Broderick and Vice President for Research Mohammad Karim announced the selection.

Sokolowski, a retired Naval officer, has worked at VMASC for nearly a decade. He served as a project scientist and later as director of research before being called upon in 2009 to be interim executive director after the departure of Michael McGinnis, who left VMASC to lead a technology and science center at the University of Nebraska.

“John Sokolowski has been an innovator in modeling and simulation and an efficient collaborator with VMASC’s partners,” said Broderick. “His appointment will hasten Virginia’s rise as a provider of modeling and simulation technology.”

One of the industry members of the search committee, John Dannon, senior analyst with the Lockheed Martin Center for Innovation in Suffolk, said of Sokolowski, “He is clearly the right guy for the right job at the right time.”

“How do you best utilize that kind of technology to provide the best kind of training available? What needs to be developed from a simulation standpoint to make that training effective?” Sokolowski said.

“That’s, I think, the short- and mid-term area where I see MS&V going. Probably in the next 10 years, we will try to fill those holes from a research standpoint, to make this coupling between the technology and the need to reduce patient deaths or injuries.”

Scerbo imagines even more advances.

“The folks involved in medical imaging are taking better and better resolution images of people in a non-invasive way. Health professionals would love to marry these systems with the simulators, so the health care professionals can practice on a model of you, instead of just a generic patient,” he said.

The selection, according to Dannon, “sends a message across the Commonwealth of Virginia, and the nation, that Old Dominion University is committed to providing the best possible leadership to this world-class research center.” He added that the new director’s “comprehensive vision for VMASC’s future and his reputation as a respected researcher ensures that Hampton Roads will remain an international leader in modeling and simulation research.”

Dana Dickens, president and chief executive officer of Hampton Roads Partnership, a nonprofit economic development organization, added, “Dr. Sokolowski has a clear vision for the continued leadership of ODU and VMASC in the modeling and simulation arena within the Commonwealth and internationally, capitalizing on partnerships and research between government, industry and academia. The Hampton Roads Partnership and I are eager to continue working with Dr. Sokolowski and VMASC to promote Hampton Roads as the center of the MODSIM World.”

(John Sokolowski Named VMASC Executive Director)
More Grant Proposals Mean More Grants

Writing Team is in Unique Position to Promote Research Agenda

The solicitation sent out early this year by the U.S. Navy’s Space and Naval Warfare (SPAWAR) Systems Center Atlantic offered extraordinary research and development opportunities for Old Dominion University. Nearly $30 million in funding over five years was up for grabs, payable to universities in the mid-Atlantic and South that would be chosen to provide research, training, analysis and other services to SPAWAR.

Faculty members at ODU’s Frank Batten College of Engineering and Technology had done previous contract work with SPAWAR – one of the operation’s main centers is only three miles from the Norfolk campus – and they knew that the range of expertise in their college covered many of the electronics services described in the 76-page solicitation.

But it became clear to the engineering researchers and to the ODU Office of Research that the scope of SPAWAR’s upcoming needs would require the contributions of physicists and other scientists, of writing coaches and language translators, of sociologists and testing experts and of management and human performance specialists.

In other words, two dozen or more of ODU’s academic departments might be called upon to contribute to the grant proposal. The monetary award for the university’s researchers and instructors could be large, but the challenge of coordinating a proposal process involving so many investigators seemed daunting.

Cue Karen Eck, the director of research development for ODU, and her team of grant writers. “This was an opportunity that shows the wisdom of having a central team of grant writers, each with a specific college assignment. We were in a unique position to help pull this proposal together,” Eck said.

Mohammad Karim, who became ODU’s vice president for research in 2004, worked with Kaethe Ferguson, a former director of research development, to begin forming the grant writing team in 2006, when two writers were hired. Since then the program has grown to a complement of five writers. Simultaneously, the research and development (R&D) spending at ODU, which is made possible by grants, has moved steadily up.

ODU’s R&D expenditures in 2006 were $65.36 million. In 2009, the total was $96.18 million.

Just as telling, according to Eck, is the jump in the dollar amount of grant proposals submitted by ODU faculty members. “You can’t get a grant unless you submit a proposal,” she explained. “So this is an important indicator.” In 2006, the university’s researchers applied for $120 million in grants. That figure moved up to $224 million in 2008 and to more than $300 million in 2009.

Investment Paying Off

“We have made research and development a priority at Old Dominion, and our investment in a grant writing team is evidence of that,” Karim said. “This is an investment that is paying off. Preparing a grant proposal is a difficult undertaking for any faculty member and we owe it to our researchers to give them the most assistance possible.”

Karim and Eck said the Office of Research has insisted on high qualifications for the grant writers and career experiences that mesh with the demands of the job. Three grant writers have doctoral degrees, as does Eck, and the others hold master’s degrees. Familiarity with research disciplines is necessary, but people skills are too, as well as writing and editing skills and creativity, Eck said.

The writer with the most seniority, Luna Magpili, was one of the original hires in 2006. Her master’s in industrial engineering from the University of the Philippines and doctoral degree in systems and information engineering from the University of Virginia have served her well in her assignment to the Batten College. “She is an example of how we put grant writers in colleges who have the appropriate background,” Eck said. “Luna’s training is in engineering and she knows the terminology and the technology.”

Administrators who work with Magpili provided their own endorsement. “A grant writer has been the true enabling link that was long needed for, particularly, the proposals with multiple investigators and even multiple institutions,” said Oktay Baysal, the Batten College dean. “We have seen the results of having Luna in this critical role.”
Karen Eck, director of research development. (Joined ODU in 2009) She served as the biomedical grants officer at McGill University in Montreal, Canada, for four years before joining ODU. She also did postdoctoral research at McGill and l’Universite de Montreal and served as director of community resource development for Federation CJA, a nonprofit umbrella organization supporting community service agencies in the Montreal Jewish community. She has presented workshops on grantsmanship, peer review and foundation funding. Her academic training is in cognitive psychology and psycholinguistics with a focus on bilingualism. She received master’s and doctoral degrees in experimental psychology from Kent State University.

Luna Magpili, grant writer focusing on the Frank Batten College of Engineering and Technology. (2006) She was an infrastructure officer for International Relief and Development and a postdoctoral researcher at the University of Virginia before joining ODU. Her bachelor of science and master's degrees in industrial engineering are from the University of the Philippines. She received a Ph.D. in systems and information engineering in 2003 from the University of Virginia. She currently serves as a reviewer for the National Science Foundation.

Jackie Stein, grant writer focusing on the College of Arts and Letters, College of Business and Public Administration and university administration. (2007) Prior to joining ODU she served in various capacities as a grant writer, having written 11 proposals, all but one of which were funded. She also has served as a day treatment therapist at Child and Youth MHA Services, Virginia Beach Department of Human Services. She received a bachelor's degree in English language and literature from the University of Maryland and a master's in counseling psychology from Bowie State University.

Prakash Viswanathan, grant writer focusing on the College of Sciences. (2008) Prior to joining ODU, he served a postdoctoral fellowship in electrophysiology at Vanderbilt University and was a research assistant professor in the Department of Cell Biology and Physiology at the University of Pittsburgh. He received a bachelor's-level degree in instrument engineering from Karnatak University in Dharwad, India, and a doctorate in biophysics and bioengineering from Case Western Reserve University. He is a member of the American Heart Association Basic Cardiovascular Research Council.

Melissa Hallman, grant writer focusing on the Darden College of Education. (2010) She has more than eight years of experience in the nonprofit sector, most recently as a funding specialist and grant writer for the Family Alliance in Lynchburg, Va. She also has done grant writing for the Corporation for Jefferson's Poplar Forest and the Virginia Community Healthcare Association. At the Virginia Association of Health Plans, she served as director of administration. She has a bachelor's degree in political science from the University of Richmond and a master's in public administration from Virginia Tech.

Helen Fillmore, grant writer focusing on the College of Health Sciences. (2010) She was a faculty member at Virginia Commonwealth University in the Department of Neurosurgery from 1998-2010. She also has been a reviewer for numerous scholarly journals and a grant reviewer for the National Institutes of Health, Department of Defense Breast Cancer Research Program, and the Arizona Biomedical Research Commission. Her Ph.D. from the University of Tennessee, Memphis, is in anatomy and neurobiology.
How the Process Works

It was Magpili who took a leading role in pulling together the SPAWAR proposal, working closely with two other facilitators, Cindy Walters of the Virginia Applied Technology and Professional Development Center, and Betsy Foushee of the ODU Research Foundation. The grant’s principal investigators are Charles Keating, professor of engineering management and systems engineering and director of ODU’s National Centers for System of Systems Engineering (NCSoSE), and Charles Sukenik, associate professor of physics.

Prakash Viswanathan, the grant writer for the College of Sciences, was called in early on to help. He has been a researcher himself, serving as a research assistant professor in the Department of Cell Biology and Physiology at the University of Pittsburgh. His doctorate in biophysics and bioengineering is from Case Western Reserve University.

Kevin Adams, the principal research scientist at NCSoSE, and the investigator who devoted the most hours to the eight-week proposal crafting process, had nothing but good things to say about Magpili and Viswanathan.

“Luna was responsible for all aspects of the 49-page technical volume of the proposal,” Adams said. “Her work was thorough, professional and delivered in a timely fashion. Prakash very capably assisted Luna by coordinating inputs from the various collaborators from the College of Sciences. The technical volume set the pace for the proposal and is the centerpiece of ODU’s offer to SPAWAR Systems Center Atlantic in their role as the premier electronics systems center on the East Coast.”

Before the proposal was submitted in March, Eck put in quite a few hours herself on the project and also assigned some chores to Jackie Stein, the grant writer who works with the College of Arts and Letters. Stein’s bachelor’s degree in English language and literature is from the University of Maryland and master’s in counseling psychology is from Bowie State University.

“This proposal, if awarded – and we should find out fairly soon (the word had not come by early May, when this story was written) – will qualify ODU as a preferred contractor to SSC Atlantic for analytical and technical support services and research and development efforts,” Eck explained. “We are proud of the role our grant writers played in documenting the expertise and capabilities of ODU’s faculty and students.”

While the SPAWAR proposal answered a solicitation, other grant proposals develop quite differently. Sometimes a researcher has a promising idea, and looks to Eck and the grant writers for help in identifying potential sources of research money. The National Science Foundation (NSF) and the National Institutes of Health (NIH) are primary funding agencies, for example, and each has numerous funding programs that have financed ODU research studies in the past.

When a grant writer and researcher – or research team – are paired, the first step may include a thorough vetting of the proposed research project to answer questions such as “Is it good enough?” or “Who cares?” There also may be a need to identify potential research collaborators, at ODU and perhaps at another institution. If the project seems sound, then the writer/researcher team settles on a target funding source, creates proposal outlines and sets timetables for the work that will be required. The grant writer may suggest ways to organize the material, and will be involved in the editing and proofreading.

Startup Help for Young Faculty

If the proposal results in an award, there is celebration. If not, the grant writer and researcher will evaluate the reviewers’ critiques and may decide to rework and resubmit the proposal.

Viswanathan said most of the researchers he has worked with in the College of Sciences are quite familiar with the grant writing process and that he helps them mainly by providing advice about writing clarity and organization.

But more is required of him when he works with younger faculty members, such as Anna Jeng, assistant professor of community and environmental health in the College of Health Sciences. He helped Jeng with the proposal that resulted in a $150,000 grant last year from the NIH’s National Institute for Occupational Safety and Health. “Prakash Viswanathan impressed me with his acute comments to enhance the content and quality of my proposal,” said Jeng. “In fact, he contributed to my success on receiving the NIH grant award.”

“Actually,” Stein added, “what we do is not just about dollars. An important part is working with junior faculty who have little or no experience in writing proposals and helping to get them connected to the world of research funding.”

Both Stein and Viswanathan used the term “jack-of-all-trades” to describe their duties. “It’s exciting in Arts and Letters,” Stein added. “One day I’m dealing with a grant in theater arts and the next it’s a grant for a political scientist studying some terrorist regime.”

In the spring of 2010, Eck filled two positions left open by resignations. Melissa Hallman became the first grant writer dedicated exclusively to the Darden College of Education. “The education faculty has been very proactive in pursuing grants and I felt they needed a grant writer who was not splitting her time with another college,” Eck said. Hallman is an experienced grant writer who holds a master’s degree in public administration from Virginia Tech.

Eck also announced that Helen Fillmore would start July 10 as the College of Health Sciences grant writer. She holds a doctorate in anatomy and neurobiology from the University of Tennessee, Memphis, and has been a grant reviewer for NIH.
‘Fit to Ride’

BY JIM RAPER

Physical Therapy Graduate Who is Also an Equestrian Develops Tests and Exercises for Anyone Who Saddles Up
You might say that Danielle Rowland galloped through the physical therapy doctoral program at Old Dominion University with blinders on. She knew precisely what she wanted for her career when she began the studies three years ago, and she was already engaged in her work of choice when she received her degree in May.

This work blends physical therapy with her longtime interest in riding and training horses. She is an equestrian athlete, a prizewinning competitor in the sort of formal dressage events you see in the Olympics.

“Ms. Rowland described her serious interest in horseback riding from the time she entered the program,” said Gail Grisetti, an associate professor in the College of Health Science’s School of Physical Therapy, and Rowland’s adviser. “One of her goals was to look for ways to integrate horseback riding and physical therapy.”

This integration of riding and therapy became real for the young woman during an internship she served earlier this year with a private company, Physical Therapy Works, in Suffolk. She was given the opportunity to create an original assessment tool and develop a series of exercises based on movement patterns riders use in the saddle.

“I had to market my idea to the horse community, as well,” Rowland said. “I started my first class March 31. It has been an amazing learning experience.” Next up for her: to expand the fitness training regimen to include rehabilitation therapies for injured riders.

A Decade of Dressage Training

Brooke Birdsong, a Physical Therapy Works employee and a client of the company’s fitness and wellness division, FIT Works, also is a horseback rider. “So I was personally and professionally interested in Danielle’s ideas. I have been very impressed with her ability to combine her physical therapy knowledge and her riding knowledge in order to design exercises with the specific purpose of improving riding performance. She quickly identified my deficits and designed exercises that would not only strengthen specific muscle groups, but also improve my reaction time and muscle coordination.”

After Rowland graduated in May and began preparing to take her licensing exam, she took a part-time job with Physical Therapy Works and is continuing to teach her popular class. “Everyone in the first class is continuing on to the second class,” she said. She has named the training program “Fit to Ride.”

Kathy Rowse, a prominent dressage judge, trainer and rider herself, and who owns Silverleaf Farm in Suffolk together with her husband, Mike, may be best positioned to comment on Rowland’s success. “She is uniquely qualified to do this class not only because she got her PT degree, but also because she is a professional dressage rider who has earned United States Dressage Federation bronze (2004), silver (2005) and gold (2006) medals,” Rowse pointed out.

In fact, it is Rowse who took Rowland under her wing more than a decade ago. Rowland had started riding horses in central Virginia’s Dinwiddie County, where she grew up, when she was 10, but it was not until she met Rowse when she was 14 that she started training in dressage. “My family could not afford a horse, but I was lucky to come across kind people who saw I needed help,” Rowland said. Through high school she took lessons and had the opportunity to ride a variety of horses at Silverleaf Farm in exchange for working there. She also became an itinerant, free-lance trainer, driving to farms in the mid-Atlantic states to coach young riders.

After high school, she enrolled in ODU – she received her undergraduate degree in 2007 in physical education and exercise science – and the Rowses let her live, as well as work and train, at their farm. This setup extended through her PT studies. “I continued to teach lessons, train horses with Kathy’s guidance, work off my board and training, and study for school. That took a lot of time management skills,” she said, “but it has been a wonderful adventure.”

Even in the excitement of beginning her career – and of developing the “Fit to Ride” program – Rowland is quick to say that her interest in dressage competition is as strong as ever. She and Rowse have become training partners, coaching each other almost daily. Both expect to benefit as well from the fitness assessment and exercise regimes Rowland has pioneered.

Golfers, Yes; Equestrians, No

Physical therapists have paid a great deal of attention to other sports, especially those in which physical exertion is much more pronounced – or seems to be – than in horseback riding or equestrian competitions.

“Sports such as golf and baseball have been studied in detail for an understanding of the biomechanics of the movements and muscle usages,” Grisetti said. “Horseback riding for the able-bodied rider has not been described or analyzed in quite this way. The program devised by Ms. Rowland will help riders understand and appreciate the muscles they need to develop to ride or compete successfully in this physically demanding sport that requires balance, flexibility and strength.”

Rowland’s success with the program, including the entrepreneurial component, came as no surprise to Grisetti, or to Martha Walker, the chair of the School of Physical Therapy.
Exercises to improve performance of horseback riders

What muscles do horseback riders use and how do they exercise and strengthen them? Danielle Rowland, a dressage rider herself and an ODU physical therapy graduate in May 2010, has created “Fit to Ride” to answer these questions.

To start, she had to identify the basic movement patterns of riders in the saddle. From this, she was able to develop an assessment that tested the strength of muscle groups required during riding, and the range of motion of certain muscle groups that she predicted to be tight. From the assessment, she was able to develop exercises for specific muscle groups that needed to be targeted, and work them in a way that they are used in the saddle.

“It was interesting to find that several of the movements are coupled, such as hip abduction and extension with hip external rotation, and hip adduction with hip internal rotation,” Rowland said. “With all of the leg and hip motions that are used to cue the horse, the core needs to be engaged to maintain balance and stability on the horse. The less outside movement – weight shifting – we produce in the saddle the easier the horse can maintain balance and perform the movements the rider asks.”

Her basic exercises focus on “teaching” the transverse abdominus to contract and keep the spine in neutral alignment. From there, she adds the specific movement patterns, then ramps up the exercise with the use of a Bosu, stability ball, Thera-Bands or free weights as the clients progress.

For example, one of the exercises that couples several motions involves clients rolling out into a plank over a stability ball (under the hips), holding a free weight between their feet and performing a hamstring curl. This exercise requires the hip adductors and external rotators to hold the weight between the feet, hamstrings to conduct the curl, the abdominal brace to keep from arching the back, and shoulder stabilizers to keep from bending the elbows and maintaining a plank.

“This correlates when a rider needs to move his or her leg back and apply pressure into the horse to ask him or her to bend around the rider’s leg,” Rowland said.

The results speak for themselves. “We have a full class, and it is proceeding wonderfully,” said Sarah Meinertzhagen, one of the professional instructors Rowland has worked with at Physical Therapy Works in Suffolk. “Danielle has done a wonderful job implementing the new program,” which Meinertzhagen described as integrating principles of physical therapy, sports performance and Pilates.
Only a few miles separate Old Dominion University and its Graduate Program in International Studies from the headquarters of the North Atlantic Treaty Organization’s Allied Command Transformation (ACT). The proximity has encouraged collaborations over the years, but none as well received by both sides as a simulation exercise this past spring.

The all-day event put three dozen ODU graduate and undergraduate students in NATO hot seats.

Students were eager to participate because they wanted a realistic learning experience. ACT officials were keen on learning how young people put information technologies to work in decision making. A third player, ODU’s Virginia Modeling, Analysis and Simulation Center (VMASC), also got into the act because one of the center’s missions is to develop simulations such as this. The result, as the university’s director of military activities Dick Whalen put it, was “win-win-win.”

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Picture a large conference room at VMASC set up to resemble the command center of NATO’s North Atlantic Council (NAC) in Brussels, Belgium. Along tables arranged in a horseshoe configuration sit students playing roles as representatives of each of the 28 NATO member countries. In the hottest of the hot seats are two ODU undergraduates in political science who have been selected by ODU professors to run the show because they are regular participants in intercollegiate international relations simulations. Timothy Gorde, who will begin law school in the fall at the University of Minnesota, is in the role of secretary general. Julian Lawson, whose goal is to work for the U.S. State Department or Department of Defense, is acting as chairman of the NAC military committee.

“I am outraged by this and believe we need to send an immediate signal to Russia that they are not going to have a blank check to do Georgia 2.0.”

ODU student Timothy Gorde, in his role as NATO secretary general. Gorde (right) below with Julian Lawson.

Will it be FORCE, or Diplomacy?

NATO Simulation Pressures Students to Forge a Response to Threatening International Incidents
Flashing on large screens before the role players are military and intelligence reports, maps, and occasionally a news report pertinent to NATO. When the simulation formally begins all of the screens zero in on an out-of-the-way part of the world that borders Russia, Turkey, Iran, and the Caspian Sea. This is the South Caucasus region of Eurasia.

‘Arrests’ in Turkey
Turn Up the Heat

A high-priority intelligence report warns of potential guerrilla actions by ethnic Armenian secessionists from the Nagorno-Karabakh region, which the international community recognizes to be part of Azerbaijan.

Armenia, which borders Azerbaijan, is friendly with Russia. Azerbaijan has some ties to NATO, although it is not a member. The intelligence suggests that the intended target of the guerrillas will be a strategic installation or associated infrastructure.

Other reports follow just minutes apart. Turkish officials announce that they have thwarted an attempt by Kurdish militants to damage an oil pipeline that runs from Baku on the Caspian Sea in Azerbaijan through Tblisi in Georgia and to the Mediterranean port of Ceyhan in Turkey. A statement from the Russian government pledges support for ethnic Armenian minorities in Azerbaijan. Russia follows up by beginning to move military resources in the Russian republic of Dagestan to the border with Azerbaijan. Turkey responds with a military alert of its own.

Leaders in Georgia, which itself suffered a violent incursion by the Russian military in 2008, announce solidarity with Azerbaijan and endorse action by NATO to forestall the Russians. Russia immediately warns that NATO should not intervene. Further intelligence reports indicate Russia may be intent on disrupting the flow of oil through the Baku-Tblisi-Ceyhan pipeline. Turkey requests support from NATO and Azerbaijan grants NATO permission to deploy air and naval forces in its territory.

As the reports stream in, the student role players try to find the authentic voice of the countries they are representing. About half of the 28 representatives seem reluctant to recommend a military response by NATO. The Portuguese representative does not want NATO to act rashly and irritate the Russians. (She notes later in an informal discussion that Portugal has critical trade ties with Russia.) “We need direct communications with Russia before we take any action,” she argues.

But Gorde, who is acting as the secretary general, fears diplomacy may not be enough to stop another Russian incursion into the southern Caucasus. “I am outraged by this and believe we need to send an immediate signal to Russia that they are not going to have a blank check to do Georgia 2.0.”

Real NATO Officials
Monitor the Action

The debate continues and the 28 members are at gridlock. Another group of role players are at a media desk, representing the world’s news organizations. They post stories on the screens calling the NATO council “paralyzed.” The media taunts are real enough and the council feels the pressure. Exchanges become testy.

Dick Bedford, the NATO official in charge of “Decision-Making Simulation 2010” and the ACT branch head for strategic engagement, is at a side table taking notes and smiling. He says he has run similar simulations with university students in Italy, as well as at Harvard and the U.S. Naval Academy. Each simulation develops its own personality, he says, and adds, “This is going well.”

Regina Karp, who directs the Graduate Program in International Studies (GPIS) at ODU’s College of Arts and Letters and served as a coordinator of the simulation, is just as positive: “This is an invaluable experience for the students.”
Allied Command Transformation is NATO’s agent for change. While its counterpart in the NATO military command structure, Allied Command Operations, focuses on day-to-day operations, ACT looks to the future. It focuses on training and education, concept development and the research and technology that can make NATO more efficient and effective.

Bedford told the simulation participants in his introduction that he and his colleagues are seeking to refine NATO decision-making processes so that they can take better advantage of present-day communications technologies. “I’m not one of those people who believe technology is everything,” he added. “Wisdom and experience are most important. But we’re essentially making decisions the way we made them in 1985, getting information outside the (crisis) room and then going into the room to debate and try to reach a consensus.”

Today’s students, however, are “getting information all the time,” Bedford said. “Smart phones and computers are appendages of yourselves.”

In the past few years ACT has been doing simulations on college campuses, mostly in Italy, to test how technology can best be harnessed to help with decision making of the sort that is required of the NAC and NATO. “Younger people are more open to using technology,” Bedford said. “This is intuitive for them, this multitasking. And I find it a most fascinating thing the way these students slide into their roles rapidly.”

The simulation participants go into the afternoon still at stalemate about their response to the Russians. (They had received briefing materials about NAC, NATO and the countries they were to represent, but they knew nothing beforehand about the crisis that would come their way.)

One option the role players have is to be briefed by experts, and they are happy to have their questions answered. In this case, the experts are real NATO personnel. One gives them a rundown of the history and politics in the South Caucasus. Another is a military expert whose advice opens doors for the deliberators. Yes, the military expert says, NATO putting troops on the ground in such a hot spot, or directing warplanes to fly over a hostile country, could escalate the crisis. What about a naval response, a show of NATO force? This, he says, seems to be the best option.

A Decision is Made

Numerous other complications arise that bring Iran, and even China, into the mix of players in the crisis. In the end, the role players reach agreement. They will pull warships from member countries into a NATO fleet to be based in Greece. Maps and charts on the screens in front of them help the participants determine how quickly certain ships could move into position. Just the announcement of such a move will give Russia second thoughts about a military incursion into Azerbaijan, the students decide.

In post-simulation evaluations, Gorde says he is satisfied with the day’s work. “No troops were sent. I felt this was a good solution, one that wasn’t crazy but that could be escalated if the situation called for it.” His sidekick, Lawson, added, “The simulation played out well. The pipeline situation didn’t really get solved. However, that is the nature of crises. As soon as you begin to respond to one crisis, another one hits you right in the face.”

VMASC Executive Director John Sokolowski had been a simulation spectator. “The world faces an ever increasingly complex set of situations. Decision makers require tools and methods to help them better understand these complex events, and modeling and simulation is one such tool,” he said.

Through M&S, he added, decision makers can explore and play out various options to gain a clearer insight into the problem itself and the ramifications of the decisions being considered. “Decision results can be visualized in a meaningful manner, large amounts of information can be presented in a concise way and several options can be explored in a short period of time to help render a more informed decision.”

Karp, the ODU GPIS director, described the student response as “very, very positive,” and said she hopes to develop a semester course designed around international crisis simulations. She, Bedford and Whalen agreed that a NATO simulation should become a yearly event at ODU, perhaps being lengthened from one to two days.

One advantage of ODU’s involvement in international relations simulations is the extraordinarily diverse student body on the Norfolk campus, Karp said. About half of the participants in the latest simulation were from countries other than the United States. “I did have a rule, though, that you couldn’t represent your native country.”

The simulation also benefited because many participants had taken part previously in ODU’s longstanding Model United Nations program. The sponsor of the university’s Model U.N. Society, Aaron Karp, senior lecturer in political science, recruited students to fill the simulation roster.

A decade-long partnership between ACT and ODU made the simulation possible, according to Whalen, who is a retired Navy captain. A memorandum of understanding between the two extends “a cooperative mode of operation in the interest of sharing resources which support the missions of both parties, and which enable individuals associated with both to benefit from the wealth of expertise represented.”
A Very Special Microscope

NSF GRANT GIVES YOUNG STANDOUTS IN NANOTECHNOLOGY A SOPHISTICATED NEW TOOL

“The instrument is an important component in modernizing undergraduate and graduate courses in this field, which is critical for advancing the nanotechnology workforce in the region and beyond.”

Professor Shizhi Qian
It is called a scanning probe microscope, or, simply a SPM, and this particular state-of-the-art model can perform simultaneous multiple probes of almost unimaginably small samples. It also promises to give a big boost to the work of a talented, young group of micro- and nanotechnology researchers at Old Dominion University.

The purchase of the instrument was made possible by a $310,000 grant from the National Science Foundation (NSF) with the daunting title of “Acquisition of Four-Probe Multiview 4000 AFM, NSOM and SPM.” The investigators receiving the funding are Shizhi Qian, assistant professor of aerospace engineering; Roland Cooper and David Gauthier, assistant professors of biological sciences; Julie Hao, assistant professor of mechanical engineering; and Ali Beskok, the Batten Endowed Chair in Computational Engineering and professor of aerospace engineering.

Mohammad Karim, the ODU vice president for research, said the university’s Frank Batten College of Engineering and Technology and College of Sciences “are committed to increasing educational opportunities and research in the promising fields of micro- and nanoscale science and engineering,” and that this new instrument will advance these goals.

NSF support for acquisition of the instrument, which was developed by Nanonics Imaging Ltd., will be augmented by $133,000 from the university. The instrument was scheduled to be shipped to campus in late spring 2010.

**Commitment to Studies at the Nanoscale**

The grant proposal written by the five faculty members notes that each of them recently joined ODU and that their presence on campus, together with their startup and seed funding of nearly $1 million, prove the university’s commitment to research and development at the nanoscale.

“Expecting huge markets in the future, local and federal governments, educational institutions, military, and industry have greatly increased their research and development in micro/nanotechnology,” the proposal states. “It is predicted that micro/nanotechnology will bring revolutionary changes in many areas needing a more advanced next generation of engineers and scientists. ODU has recognized the educational and workforce development needs in this emerging field and has been building a micro- and nanoscale science and engineering academic base by hiring new faculty and supporting research in these areas.”

Qian, who led the team of researchers seeking the grant, said the project enhances ODU’s contribution to scientific and educational progress in the rapidly evolving fields of nano- and microtechnology, and moves the university forward as a scientific and intellectual resource in Hampton Roads. “The instrument is an important component in modernizing undergraduate and graduate courses in this field, which is critical for advancing the nanotechnology workforce in the region and beyond,” he explained.

Nanotechnology involves work done at the nanoscale level between 1 and 100 nanometers. A nanometer is one-billionth of a meter, while a micrometer or micron is one-millionth of a meter.

Currently, ODU has facilities to fabricate and characterize micro-electrical-mechanical systems (MEMS) and microfluidic devices, and to characterize colloidal properties, materials and biological samples. But the facilities now in use essentially restrict researchers to work in microscale science and engineering. The new instrument will open education and research opportunities at the nanoscale, including the development of several nanotechnology courses.

In the image, investigators Gauthier (from left), Cooper and Beskok are shown.
With scanning probe microscopy, the sample being studied is scanned line by line, not imaged all at once. The near-field scanning optical microscopy and atomic force microscopy noted in the grant’s title are specific SPM techniques.

**Useful in Studies from Malaria to Micropumps**

The grant will promote a broad array of work currently being done by Qian and the other investigators. This includes fundamental research on projects that could lead to new ways to detect toxins released by terrorists, or to new strategies against malaria.

Qian conducts research in micro- and nanofluidic systems as well as electrokinetic and colloidal transport. Since joining ODU in 2008 he has been involved in two research projects that received startup funding from the university’s Office of Research. One project involves continuous insulin infusion for humans and the other aims for the development of a novel nanoporous electro-osmotic micropump for use in lab-on-a-chip applications.

Cooper, who has been at ODU since 2003, conducts research on the lethal human malaria parasite’s susceptibility to drugs. The work includes proteomic, microscopic and genomic techniques, which identify parasite proteins that regulate the response and resistance to drugs such as artemisinin. He currently has support from the National Institutes of Health for his work.

Gauthier studies diseases of aquatic organisms, with an emphasis on mycobacteriosis in fin fishes such as striped bass. The researcher, who joined ODU in 2008, has research underway to characterize species and strains of the mycobacteria that have a pathogenic impact on fish throughout the world, and some that are pathogenic to humans, as well. He also is studying how mycobacteria survive in the environment outside their vertebrate hosts, typically in gel-like biofilms that can be found on bodies of water. The new instrument will help him study how these biofilms provide microenvironments amenable to bacterial replication and survival.

Hao’s expertise centers on micro-electro-mechanical systems (MEMS), the devices that can be no larger than a thumbtack, but can perform a function such as sensing the presence of minute quantities of a biological or chemical substance in the atmosphere. Her groundbreaking work with MEMS has won her two recent NSF grants, one of which involves the development of a new type of MEMS resonator. Such a device could be adapted with the help of the nanochemical writing capability of the Multiview 4000 for sensing various chemicals and biological species. Hao’s work with the instrument also will include collaborations with two other ODU researchers, John Cooper in chemistry and Michael Stacey of the Frank Reidy Research Center for Bioelectrics, to develop educational and research programs in her field. She came to ODU in 2006.

**Unique Experiments on Heat Transfer**

Beskok, who joined the university in 2007, directs the Batten College’s Microfluidics Laboratory. His current NSF-supported project, “Interface Resistance and Thermal Transport in Nano-Scale Confined Liquids,” is directly related to the acquisition of the new instrument. With the device, he and his research team will be able to do unique experiments on heat transfer in nanofluids, which are fluids seeded with nanoparticles. Nanofluids seeded with metallic particles exhibit increased heat transfer properties and have been cast as new-age coolants for tiny electronics components.

The Multiview 4000 is distinguished by its ability to create a high-resolution computational image of a sample, while at the same time manipulating or performing other tests on samples. It uses both a sample and a tip scanner, and enables the use of up to four probes, as well as optical fibers, nanopipettes or nano-tweezers, that operate in close proximity to one another and can be controlled independently with nanometer precision.

Beskok said his research group plans to conduct unique heat transfer experiments using the multi-tip probes, such as generating a heat pulse in the vicinity of a nanoparticle fixed onto the surface of a secondary probe, and measuring its temperature rise as a function of time. “Such experiments, after being correlated with our theoretical predictions, can allow us to understand the interface resistance between the fluid and the particle surface,” he said. “Increase in the interface resistance will reduce the benefits of seeding coolants with nanoparticles.”

Added malaria researcher Cooper, “The scanning probe microscope will potentially allow us to investigate the effects the antimalarial drugs have on parasite membrane integrity and composition. This instrument will also prove useful to determine how such drugs affect the structure of hemozoin, a crystalline by-product of the hemoglobin digestion by the parasite. Inhibiting the process of hemozoin formation is lethal to the parasite, and is a principal target of several key drugs, yet the dynamics of drug-hemozoin interactions are not well understood.”

![Hao and Qian](image-url)
Get Engaged!

A Prescription for an Ailing Press

BY BURTON ST. JOHN III

You would think that, as a former public relations executive and scholar/observer of mainstream news operations, I would not experience an abrupt “sea change” concerning the traditional press. Additionally, as an academic who researches how journalists go about making sense of the world so as to report news, I am bound to keep up (as best I can) with the current storm of changes for newsrooms that have been prompted by rapid-fire technological developments and ever-present business model mutations. Nevertheless, back in the spring of 2009, I sat down for lunch with an old reliable news purveyor and found him almost unrecognizable.

It was Newsweek. The first issue of its format change. And it was foreign and disturbing, a plastic surgery that had gone really bad. The magazine was almost completely eviscerated of any original reporting; instead, it was filled with the work of columnists, Fareed Zakaria and Robert Samuelson, to name two. What few legitimate stories appeared were smothered by large photos, charts designed by over-caffeinated graphic designers and surrounding pages filled with short blurb-like interviews and giant pull quotes. In the weeks to come, it would not get any better: Newsweek started to place on its feedback page anonymous comments from its website, Twitter and Facebook. What is going on here, I thought; this is supposed to be Newsweek, not Opinionweek.

What is surprising is that apparently the editors at Newsweek failed to ask themselves, “Is this really the way to engage our news consumers?”
In retrospect, it became painfully obvious that Newsweek offered its own version of what is increasingly happening in many mainstream print and broadcast news operations. These traditional newsrooms, harvesting evidence that younger news consumers are going to the Internet for news, become centered on mimicking attributes of the Web. Provide more pundits. Offer more ephemeral visuals, charts and graphs. Insert more random citizen comments.

**What Gets Lost is Original Reporting**

Too often, what gets lost is a focus on delivering original news reporting. And, as news consumers become disgusted and abandon such offerings (I let my Newsweek subscription expire), it seemingly doesn’t occur to these traditional news operations to ask, “If increasingly we’re providing an approximation of what people can readily find online, then why do they need us?”

Here’s one answer to that question: citizens are increasingly providing evidence that they don’t want the traditional press to engage in a superficial focus on aping the often attention-deficit-like attributes of news online. Instead, they want deeper news that engages, in some degree, their daily reality. And they say they are not getting such credible and relevant news. By late 2009, a Pew Research Poll revealed that 61 percent of respondents had concerns about the accuracy of the news. Another Pew survey found that 63 percent of Americans said they would not miss their daily newspaper if it ceased publication. Pew has also found that, nationally, readership of newspapers continues along a downward spiral (local, cable and broadcast network news also are suffering downward viewership trends). In response, too often the mainstream news media leverage technology like blogs, Twitter and interactive graphics to merely tinker with the packaging of news. In doing so, they fail to consider how the lack of deep news – meaningful, accurate and pertinent – results in further public disaffection with many traditional news outlets. Not surprisingly, the death cycle of declining readership and viewership continues.

**Captive to Journalistic Routines**

There are several reasons why the traditional press does not stop to examine its role in this “death spiral” dynamic. First, as scholar Gaye Tuchman has pointed out, the daily practices of newsrooms are not conducive to contemplation and reflection; instead, journalistic routines focus on delivering a product that meets the needs of the outlet’s particular news cycle. Secondly, as a burgeoning school of political economists continues to point out, pressures from a variety of news owners (including shareholders and parent companies) emphasize gathering and delivering news at the least cost so as to maximize profitability. Finally, there are others, like myself, who also maintain that the historically grounded professional orientation of the press – the prizing of expertise, facts and data – inclines the press to accept as news the viewpoints of privileged interests that can provide such authoritative trappings. These viewpoints, while informed, are often at odds with unreported realities in local communities. While all these schools of thought are divergent in emphasis, collectively, they point to how traditional news operations lack a citizen-engaged approach to gathering and reporting news.

A citizen-engaged press is marked by the central idea that the mainstream news is more than a professional, product- and profit-driven enterprise. It is a field of practice that is dedicated to providing the citizenry the information that it needs to successfully navigate the complexities of a modern democracy. As former Wichita Eagle editor Davis “Buzz” Merritt said, in a representative democracy Americans do not give away ultimate power; instead, the public lends it to elected officials. “The only way for people to retain their ultimate power is by being engaged in its exercise,” he said, and journalism provides the vehicle through which the public can build the capacity to fruitfully interact with its representatives. In fact, Merritt’s observations interplayed well with the theoretical perspective of New York University professor Jay Rosen who spoke often on behalf of a movement-in-design in the 1990s called public journalism. Rosen advocated a citizen-engaged orientation of journalism, one that addresses “people in their capacity as citizens in the hope of strengthening that capacity.” Journalism, he said, “should try to make public life go well, in the sense of making good on democracy’s promise.” Public journal-
ism practices evolved from such a philosophy, encouraging journalists to seek out citizens to help determine a fuller frame for a story. Turning to Rolodexes in the newsroom was no longer enough – journalists were encouraged to get in touch with citizens by interviewing them about civic issues, holding public forums and even turning up questions from the public that they could then use to help hold officials accountable.

Appearances of Engagement

Unfortunately, public journalism also eventually suffered from news operations’ tendencies to focus on form and not on intent. The rise of the Internet had some role in this. News managers began to conflate technology’s ability to provide interactivity with actual citizen engagement. Newsrooms were encouraged to put reporter e-mail addresses on stories, place forums on their news websites and develop portals where citizens could provide videos or still shots. Citizen engagement became less about turning to the public to help determine the fuller breadth of news stories and more about showing that the news operation was minimally providing vehicles (e-mail addresses, Web-based forum pages) that give the appearance that the newsroom is connected with the public.

It is this use of technology to simulate a connection with the public that is particularly troubling right now. Let’s face it, it’s a lot cheaper and easier for newsrooms to turn to blog posts and use photos and videos from citizen contributors to fill news space. However, much of this citizen-generated material does little to inform the citizenry on compelling public issues because news outlets do not contextualize the material, or supplement it with additional reporting. As Jack Rosenberry and I discuss in the recently released book “Public Journalism 2.0: The Promise and Reality of a Citizen-Engaged Press,” journalists have the training, experience and responsibility to cull community-relevant news from citizen-created materials. Just retransmitting what a blogger thinks about the state of K-12 education or putting up a citizen-submitted video that shows a teen being bullied by his peers does little to provide the fuller accounts that people need so that they can make informed decisions.

Essentially, journalism needs to move beyond a fascination with technology that is greatly informed by an unreflective professionalism geared to market needs of media owners. Martha Nussbaum, in her new book “Not for Profit: Why Democracy Needs the Humanities,” discusses a similar problem as regards the liberal arts in the United States. From K-12 through higher-level education, she says, Americans are being forced to choose between “a form of education that promotes profit and form of education that promotes good citizenship.” She points out that the American educational system is too focused on “producing generations of useful machines, rather than complete citizens who can think for themselves.” She identifies a problem in our contemporary educational system that resonates with a key dysfunction of today’s journalism – too much emphasis on the “useful machine” of maximizing news production at the lowest possible cost instead of engaging and enlightening the citizenry.

News of Compelling Public Interest

The first thing that modern journalism can do to reverse such a deleterious trend is to commit to marshaling resources with the intent of finding out what news is of compelling public interest to citizens. Once those resources are in place, reporters receive their mandate: get out of the newsroom and go where people congregate in public places and at publicly accessible, community-initiated meetings. While there, go beyond talking with officials and opinion leaders and ask citizens what drives quality-of-life issues in their communities. Avoid simple, “fair and balanced” equations; there are often more than two sides to an issue, so report on the range of viewpoints. If culling information from blogs, forum posts or citizen-initiated videos, contextualize the material by supplementing it with voices of relevant individuals in the community.

None of these steps is really that hard. In fact, students in ODU’s course Public Journalism in the Digital Age began putting them in place well over two years ago. While students often found it difficult to find citizen sources, they accomplished the task by being creative and resourceful: turning to friends, family, community groups, social networking sites and even going to public places like coffeehouses. One student reflected that he found that a hot news story – he wrote about transportation – became even more complicated to report when he sought multiple voices because, “It’s a good bet that something about the issue is going to change.” Nevertheless, he was able to gather what he could about the problem of road gridlock, including a variety of citizen perspectives about how funding for road projects could best be accomplished.

If students who have none of the resources and networks of professional journalists can make such an effort to connect news reporting with the concerns of the citizenry, how much more readily can newsrooms embrace such an approach? Perhaps today’s mainstream journalism needs first to stake out such changes in routine, and then the professional journalism ideology that is unreflectively concerned about marketplace pressures can be counterbalanced. If journalism chooses not to pursue a more citizen-engaged approach, no amount of slashing reporting in favor of columnists, graphics and rehashings of Internet-based information will save many traditional newsrooms. As I write this in early May 2010, I can assure you that The Washington Post can tell you a little about that; it just put Newsweek up for sale.
How the Cards Fall

Emeritus Professor Tries His Hand at Analyzing the Game of Blackjack

“This was 2008-09 and the stock market was so stressful that for diversion I turned to the building of probability models for this serendipitous hand of blackjack poker. Old dogs can still do old tricks after they retire.”

Emeritus Professor Charlie Cooke
hey say that a lot can be learned about a lake by analyzing a liter of its water. Charlie H. Cooke, an Old Dominion University emeritus professor of mathematics and statistics, working along those same lines, is learning a lot about the card game of blackjack by analyzing just one hand.

His “serendipitous” experiment, as he calls it, focuses on a blackjack player choosing to stand on two 9s against the dealer’s up card of 7.

This has been a hand of some interest to blackjack experts through the years, and many published tips suggest that the player split the nines and play two hands against the dealer. Cooke’s investigation of the hand has turned up some surprising results, and his research article on the subject was published in a recent edition of the Journal of Computers & Mathematics with Applications.

“I became interested in this problem after I retired in 2007,” Cooke explained. First, he came across the book “Bring- ing Down the House: The Inside Story of Six M.I.T. Students Who Took Vegas for Millions” by Ben Mezrich. Then he saw the movie “21” that was based on the book.

This sent him looking for mathematical analyses of the game and he discovered the work of Edward O. Thorp, a mathematics professor who became famous for his computer-aided probability studies of casino games and the stock market. Thorp published the best-selling “Beat the Dealer: A Winning Strategy for the Game of Twenty-One,” in 1962.


“I was inspired,” Cooke said. “This was 2008-09 and the stock market was so stressful that for diversion I turned to the building of probability models for this serendipitous hand of blackjack poker.

“Old dogs can still do old tricks after they retire,” he added with a laugh. He even wrote his own Fortran program to run the computer analysis that he wanted to do.
From Fluid Dynamics To Blackjack

Cooke taught probability and numerous other graduate and undergraduate courses - as well as advised five Ph.D. students - during his 38 years at ODU. He used release time over those years to work on projects at NASA Langley Research Center in Hampton, Va., and the Fluid and Physics Branch, U.S. Army Ballistics Research Laboratories, Aberdeen Proving Ground in Maryland. Much of his work was in computational fluid dynamics, which at first blush may seem far removed from a card game. But for an elite mathematician, almost all challenges can be framed, and solved, using numbers.

Blackjack - also called 21- is one of the world’s most popular casino games because its rules are not difficult to learn and players can turn odds in their favor by developing skills and strategies.

The central object of the game is to get a hand with a value as close as possible to 21 without going over. A hand that goes over 21 is a bust. But, as analysts such as Thorp, and now Cooke, are quick to point out, the overarching object is to beat the dealer, who is forced to continue to draw until he gets a hand of 17 (or 18 through 21) or else goes bust. For example, a player who stands on a 7 and 6 for a total of 13 may win if the dealer starts with 3 up, a face card (10 points) down for a total of 13, but must draw again and gets a 9 to go bust at 22. A small advantage for the player is that the dealer must stand if his cards total exactly 17.

It doesn’t take a beginner long to learn a central point affecting outcomes in blackjack - that there are a heck of a lot of 10-point value cards in a deck of 52 cards. Kings, queens, jacks and 10s of the four suits all count 10, which means that 16 cards, or nearly 31 percent of the deck, are 10-value cards.

That brings us back to Cooke’s serendipitous hand of the player’s two 9s against the dealer’s up card of 7.

It was Thorp’s opinion that the player should split, which means he separates the 9s and asks for each 9 to be hit with another card, allowing him to lay two bets against the dealer’s hand. This opinion is echoed by contemporary online experts, one of whom writes: “If the player is dealt two 9s, then his hand value is 18. If he splits (because of the large number of 10-value cards), then he has two hands that have a likelihood of reaching a value of 19.” The expert further writes that the player “may be inclined not to split, but computer simulations have shown that it is worth splitting in this case.”

“(On the other hand, experts are in agreement about never splitting some pairs, such as two 5s. If the player stands on two 5s, for a total of 10, he has a good chance of being hit with a 10-value card for a very good total of 20. If the player splits, then he has two hands that have a high probability of reaching the problematic total of 15.)

But the two 9s against the dealer’s up card of 7 seemed to Cooke to be a good candidate for serendipity, meaning it could turn out better than expected for the player who chooses to stand and not split. “I kept seeing advice to split, and I said, ‘Why? I don’t understand that.’”

In Pursuit of a Sure Thing

Cooke describes himself as a “bird in hand” kind of guy, one who prefers one sure thing to two possible birds in the bush. To him the player’s total of 18, with the dealer showing 7, and likely to have a 10-value down card, seemed a good thing, if not a sure thing. He wanted to know just how good the player’s expectation of winning should be.

He knew of the contentions of Thorp and others that computer simulations had proven splitting the 9s to be the better strategy. Cooke noted that past models for blackjack probability calculations have involved a procedure called “sampling with replacement.” In other words, for every draw from a well-shuffled deck, the probability of the card being a particular one is assumed to be 1 in 52.

But as cards are dealt in a game, the actual probability is determined by the cards left in the deck. In other words, the probability changes to 1 in 51, 1 in 50, 1 in 49, and so forth. To compensate for this, the correct probability model assumes that “sampling without replacement” is used.

“The problem with sampling without replacement is that it’s computationally and logically much more difficult,” Cooke said, “and, in general, sampling with replacement may be close enough to show a trend, which may be enough to satisfy a blackjack player.”

Also, certain circumstances make it nearly impossible to write a computer program to sort out a sampling without replacement problem - say if the dealer, trying to beat 18, draws a bunch of low-value cards to add to his 7 and ends up holding eight cards, which is possible. The complexity arises because sorting of possibilities encounters an inverted tree structure, with an explosion in computer logic as the number of draws increases.

Cooke, nevertheless, forged ahead with the sampling-without-replacement strategy and was able to probabilistically model the dealer’s results if he drew up to five cards in each contest against the player’s two 9s. He truncated the simulation at five draws for the complexity reasons noted above, but built a mathematical case for the simulation not needing to extend to six, seven or eight draws.

He also analyzed the hand using the traditional sampling-with-replacement model. Finally, as a gauge of whether his calculations were correct (computer programming was involved), he resorted to the use of the statistical law of large numbers applied to repeated trials of an experiment.

“I’ve never gambled on the game. I’m not doing this for money, or for any other gain. An emeritus professor no longer faces the ‘publish or perish’ ultimatum.”
Here, more importantly, to check his theoretical analysis he conducted the experiment of obtaining consecutive dealer hands by playing through decks (with the two 9s and one 7 removed) until he had a statistically significant 241 experimental hands of the dealer with a 7 up card trying to beat a player with two 9s. The experimental results came within one-tenth of 1 percent of replicating the player’s expectation of winning from the sampling-without-replacement simulation. “I was surprised and delighted,” Cooke said.

Winning Money is Not the Object

So what were the essential results of Cooke’s research?

• Sampling without replacement is better because it was found that the simpler sampling with replacement leads to expectation errors of 7 percent or better if the dealer is forced to draw five cards or more to try to beat the player’s.

• If this serendipitous hand were played continuously over long periods of time, the player is expected to strafe the dealer, winning, on average, 41 cents on each dollar gambled.

This means that the player who stands on the two 9s has a high expectation of winning, so high that splitting the 9s would seem to be an unnecessary risk. Cooke said that he believes it to be impossibly complex to program the logic required for calculating probabilities to investigate the expectation of winning for a player who split the 9s, assuming sampling without replacement.

The logic has a tree structure with an explosion of branches as the number of draws increases. For five dealer cards the probability sample space contains more than 113,000 sample points, and the size increases essentially by an order of magnitude for each successive dealer card drawn. The size of the sample space for, respectively, 3, 4 and 5 dealer cards is 1,392, 18,424 and 113,842. The greater the size, the more logic branches needed to sort out probabilities.

He said it doesn’t bother him that his findings may be too rarefied to help a casino blackjack player. “I’ve never gambled on the game. I’m not doing this for money, or for any other gain. An emeritus professor no longer faces the ‘publish or perish’ ultimatum.”

But he chuckles when he tells the story of the parlor game he has come up with as a result of his research. He has dealt through so many decks in his experiments (to finish the hand starting with the player’s two 9s and the dealer’s 7) that he now knows how to maximally stack a particular deck in favor of the player, such that the dealer never wins. Although, without stacking the player usually wins more amply than the dealer.

“I let my son-in-law have the dealer’s role while playing through the deck stacked in the player’s favor and he was greatly surprised that the player always came out with more money. If the next time he comes, I stack the deck for maximal dealer wins, and this time take the dealer’s role for myself, he will get another surprise.”

A few days after the interview conducted for this story, Cooke e-mailed news of a eureka moment that is dense enough to challenge the understanding of mere mortals, or even the average blackjack player. His analogy is to John von Neuman, at the time considered the most intelligent mathematician in the world, being hired to consult with the Rand Corp. think tank at a huge salary, but only being asked to report on what he thought about while shaving!

Cooke said even a lesser light can have an occasional von Neuman moment, and that perhaps he could be paid for what he thinks about on his daily two-mile walk.

“The thinking on the daily walk paid off,” he wrote in the e-mail. “I have been able to find an error bound that estimates the size of the error when the serendipitous hand is stopped after a given number of dealer draws. This justifies the stopping after five cards on the serendipitous hand, as the bound indicates a negligible error.

“In any situation where the player decides to stand and the dealer is required to draw several times to finish the hand, the same analysis applies. So a generally useful approach has been obtained because of my study.”

He said he hopes to be prepared to present these new results soon at a mathematics conference. Maybe there he can find an audience that can fully appreciate his intricate mind games.
Fifteen years ago, Mounir Laroussi (Quest, Vol. 9, Issue 2) began an experiment to investigate the effects of cold plasma on bacteria.

That experiment led him on a career-changing path, ultimately making him one of the world's leaders in cold plasma research, particularly its effects on living cells. Laroussi is an electrical engineering professor in Old Dominion University's Frank Batten College of Engineering and Technology and director of ODU's Laser and Plasma Engineering Institute.

The International Society for Plasma Medicine (ISPM) will recognize Laroussi's research efforts with the inaugural International Society for Plasma Medicine Award for his contributions to the development of plasma medicine as a field. He's one of three researchers worldwide being honored this year.

The ISPM announced the award at the International Conference on Plasma Medicine in Norfolk in June.

"I had no idea that this would grow into a field of research, much less that I would get some sort of award for it from my peers," Laroussi said. "I was simply a curious researcher who wanted to find out what happens to living cells when they come in contact with plasmas. Luckily, other people got interested and the whole thing snowballed."

Plasma is an electrically charged gas, known colloquially as the "fourth state of matter." It is used in vacuums in fluorescent lights and televisions. The plasma Laroussi studies is called cold because it exists at room temperature and can be made outside a vacuum at atmospheric pressure.

Old Dominion University historian Annette Finley-Croswhite's (Quest, Vol. 9, Issue 1) new book about an unsolved murder that took place in 1937 on the Paris metro subway has been praised by critics, including one who called it "well-researched and …consistently compelling."

“Murder in the Metro: Laetitia Toureaux and the Cagoule in 1930s France" is a politically charged story uncovered by Finley-Croswhite and co-author Gayle Brunelle. It was published in early April by Louisiana State University Press.

Finley-Croswhite is a professor of history and chair of the ODU Department of History. Brunelle is a professor of history at California State University at Fullerton.

The book was chosen by Canadian Distributors of Scholarly Books as their “best bet” in crime and media for summer 2010. A Publishers Weekly reviewer wrote that the authors "provide a speculative but strong plausible case for who murdered Toureaux and why. Brunelle and Finley-Croswhite have produced an exceptionally fine work that is well-researched and documented and consistently compelling."

Toureaux, an Italian immigrant, was the first person ever killed in the Paris metro. "She was a fascinating woman whose life reflected many of the complexities of inter-war France," Finley-Croswhite said in an interview.

A factory worker and young widow, Toureaux loved to frequent music halls in some of Paris' shabbier neighborhoods. She called herself “Yolande” and worked as a private detective for the Agence Rouff as well as for the Paris Police and agents of the Italian government.

"As something of a triple-agent, Yolande infiltrated a far-right terrorist organization, the Comité Secret d’Action Révolutionnaire, which went by the popular name of the Cagoule, and she took their gun-running expert as her lover,” the ODU professor said.

The authors’ research looked into why the Paris police shelved the murder investigation and left the case unsolved to this day. They build a convincing case for her having known too much about the plans of French and Italian fascists, and for the inevitable suppression of the murder investigation by men who would become post-war leaders of France.
Top Job With International Program Monitoring Change In Oceans Goes To CCPO’s Hofmann

Old Dominion University oceanographer Eileen Hofmann (Quest, Vol. 12, Issue 2) will be torn between two workplaces during the next few years, one on the ODU campus and the other in Brest, France.

When she took the helm of the Integrated Marine Biogeochemistry and Ecosphere Research (IMBER) initiative in January, Hofmann inherited a project office and full-time staff in Brest, as well as responsibility for some of this era’s most important research into climate and other global-change issues.

“This is an important international appointment,” said Richard Zimmerman, chair of ODU’s Department of Ocean, Earth and Atmospheric Sciences. “The IMBER committee has significant input to international policy regarding climate change.”

Right now IMBER is a coalition of researchers in 24 countries, and the reach of the organization is expected to grow in the near future. The existence of IMBER, which was organized five years ago, can be attributed to the conclusion of scientists worldwide that global changes under way today compose much too big an issue to be studied piecemeal.

IMBER is one of the global change projects endorsed by the Stockholm-based International Geosphere-Biosphere Programme (IGBP), an offshoot of the International Council for Science (ICSU). A second IMBER sponsor is the Scientific Committee on Oceanic Research, which is also an ICSU body.

Along with Hofmann’s new position as chair of the IMBER science steering committee, she also serves on the science steering committee of the IGBP, which is coordinating and facilitating global-change research targeting the atmosphere, land and sea. The IMBER project provides the ocean link in the suite of IGBP projects that are focused on understanding and predicting responses to accelerating global change.

Currently, the IGBP is producing a series of global-change integration and exploration reports on topics such as environmental change and sustainable development; the relationship between a high-carbon-dioxide world and nutrient loads in the seas; and the role of land cover and land use in modulating climate.

Under the IGBP umbrella, Hofmann will be guiding IMBER toward a new goal. She calls it a “new direction in the science” that brings together two thrusts in marine science. One studies how global change affects the abundance, diversity and productivity of marine populations ranging from zooplankton to whales. The other studies the sensitivity to global change of marine biogeochemical cycles - the carbon cycle is an example.

“These are different research communities,” Hofmann explained. “Now with the emphasis on climate change these communities realize they need each other. We will look at ways to pull together biogeochemical cycling and its feedback into the food web.”
A team of scientists including Robert Tuleya (Quest, Vol. 8, Issue 2) of Old Dominion University’s Center for Coastal Physical Oceanography (CCPO) turned up cautionary results from a study that paired an ensemble of climate-change projection models with tried and true models that the United States government uses in hurricane forecasting.

The scientists’ paper about Atlantic hurricanes, which appeared in a January 2010 issue of Science magazine, warns that the number of intense, category 4 and 5 hurricanes could double by the end of the 21st century. Furthermore, the strong hurricane activity may target highly populated areas in the eastern United States.

Morris Bender, a scientist with the National Oceanic and Atmospheric Administration (NOAA), is the lead author of the article. He and other authors, Thomas Knutson, Joseph Sirutis, Gabriel Vecchi, Stephen Garner and Isaac Held, are with NOAA’s Geophysical Fluid Dynamics Laboratory (GFDL) in Princeton, N.J.

Tuleya joined ODU after he retired in 2002 from GFDL, where he served as head of the Hurricane Dynamics Group. He and Bender worked together in the 1990s to develop the GFDL hurricane model.

At ODU as an adjunct professor and self-supporting research professional, Tuleya has continued to work on contract with NOAA to improve the GFDL hurricane model and to help develop the next generation Hurricane Weather and Forecasting (HWRF) model, which is now used as guidance by the National Hurricane Center. Altogether, he has devoted nearly 40 years of his career to devising computer models that predict tropical storm formation, intensity and movement of present day storms and investigating the impact of climate change on tropical storms in the future.

“This paper reports results of the most objective and thorough investigation of its kind to date,” Tuleya said in an interview.

The title of the article in Science, which is one of the world’s most prestigious scientific journals, is “Modeled Impact of Anthropogenic Warming on the Frequency of Intense Atlantic Hurricanes.” Results reported are in line with other studies suggesting that the overall frequency of Atlantic tropical storms and hurricanes could decrease as the climate warms.

For example, a recent GFDL study using a regional atmospheric model called ZETAC predicted a reduction by 18 to 27 percent in the total number of Atlantic tropical storms and hurricanes by the end of the century if the climate warms according to the projections of the Intergovernmental Panel on Climate Change.

But the authors contend that many models, including the regional ZETAC, are incapable of simulating high-intensity hurricanes. Their new modeling and simulation strategy — employing the so-called “operational” GFDL hurricane model that has been used in one form or another for the past 15 years to track and predict the intensity of tropical storms and hurricanes — simulated a more realistic distribution of intense hurricane winds than the ZETAC regional model in a control period of 1980-2006.

“We explored the influence of future global warming on Atlantic hurricanes with a downscaling strategy by using an operational hurricane-prediction model,” the researchers write in the article. “The model projects nearly a doubling of the frequency of category 4 and 5 storms by the end of the 21st century...when the downscaling is based on the ensemble mean of 18 global climate-change projections.”
ODU Biofuels Team Consulting on California Wastewater Project

A California wastewater treatment plant that is using Old Dominion University geochemist Patrick Hatcher and several other ODU researchers as consultants is getting attention from around the globe for its innovative, Earth-friendly plan to improve efficiencies.

Hatcher, ODU’s Batten Endowed Chair in Physical Sciences and the executive director of the Virginia Coastal Energy Research Consortium (VCERC), has long been a champion of algae as a biomass source of alternative fuels (Quest, Vol. 10, Issue 2). With VCERC he has also promoted systems in which algae, as they grow, can scrub harmful nutrients from wastewater and carbon dioxide from industrial-plant airborne emissions.

In Victorville, Calif., which is about 80 miles northeast of Los Angeles on the edge of the Mojave Desert, the Victor Valley Wastewater Reclamation Authority has been working with Hatcher and the ODU algae-to-biodiesel research team to grow oil-rich strains of algae in a wastewater plant’s percolation ponds. The algae feed on nitrates and phosphorus, stripping these contaminants from wastewater before it is discharged into the Mojave River.

Other than Hatcher, the ODU researchers working with the California authority include Aron Stubbins, assistant professor of chemistry and biochemistry and assistant director of VCERC; Harold Marshall, Morgan Professor emeritus of biological sciences; Gary Schafran, chair and professor of civil and environmental engineering; and Andrew Gordon, professor of biological sciences.

The algae growing in the ponds also can provide a for-fee service to industrial facilities neighboring the wastewater plant. Carbon dioxide emissions that ordinarily would escape into the atmosphere, or require an expensive anti-pollution containment scheme, can be pumped into the ponds and sequestered because the algae need carbon dioxide in order to grow.

A spokesperson for the Victor Valley authority told the Daily Press newspaper in Victorville that biofuels gleaned from algae are expected to generate electricity for the wastewater plant. Therefore, the plan would save money for the authority’s ratepayers while also helping to clean up the environment. He said the plan, which is expected to be implemented beginning this summer, has spurred recent visits to the plant from officials in Korea, China, Sri Lanka and Mexico.
Researchers Give Children with Autism a Smartphone-Image Communication System

Many children with autism communicate very little, even with the family members and teachers who are around them the most. But researchers at Old Dominion University have shown that a novel approach using smartphones and the World Wide Web can help these children express their thoughts and desires.

To Gianluca De Leo (Quest, Vol. 11, Issue 1), an assistant professor who specializes in bioinformatics and virtual reality at ODU’s College of Health Sciences, the project is yet another example of how information technology (IT) can improve human health and well being. He previously has adapted smartphones to help diabetics manage their health and employed virtual reality to promote treadmill training for children with cerebral palsy.

The autism project, which was funded by Microsoft’s External Research Group, allows children to communicate by calling up images on Windows mobile devices. A child who wants chicken for dinner, for example, can call up one image of a dinner table and another of a chicken leg.

Children with autism often are trained to express themselves by picking one or more laminated picture flashcards from a folder or binder and affixing their message or “sentence” to a strip of Velcro. A popular adaptation of this is called PECS for Picture Exchange Communication System.

There are also existing electronic communication devices such as the Cyrano Communicator and Pocket Reader that can be used to help children express themselves with images, but these devices often cost $5,000 or more.

De Leo says smartphones are cheap, easy to use and offer numerous other advantages over the laminated picture system and existing electronic communicators.

He leads the development of the PixTalk Communications System together with Gondy Leroy, associate professor of information systems and technology at Claremont Graduate University in California. Another member of the project team is Padmaja Battagiri, who received a master of science degree in electrical and computer engineering from ODU in December 2009. Her advisers included De Leo and her master’s thesis focused on smartphone use by children with autism.

The team’s paper, “A Smart-Phone Application and a Companion Website for the Improvement of the Communication Skills of Children with Autism: Clinical Rationale, Technical Development and Preliminary Results,” was published in February 2010 by the Journal of Medical Systems.

PixTalk software - which is available under an open-source license - can run on any Windows Mobile Smartphone, and is designed to work with a website that the researchers have fashioned to serve as project central. A child’s teacher or caregiver can access the website and select from an online library of images to be downloaded to the child’s phone. The downloaded file can be personalized to the child.
Breaking News

**NSF Career Award Supports Study of Wind Pattern Effects on Chesapeake Bay ‘Dead Zones’**

Malcolm Scully, an Old Dominion University physical oceanographer, has received a prestigious Faculty Early Career Development award from the National Science Foundation (NSF) that will support his innovative research of oxygen-depleted areas of the Chesapeake Bay.

The young researcher’s work so far with computer models and historical data suggests that bay cleanup efforts have been more successful than many environmentalists have thought. He believes the large “dead zones” that have developed in recent summers may have been exacerbated by physical factors such as wind.

He was awarded $750,000 for a five-year project, “Career: Physical Modulation of Dissolved Oxygen in Chesapeake Bay,” that will give him the opportunity to conduct extensive field tests in the bay. ODU is providing matching funds of nearly $70,000 to give Scully access to the university’s 55-foot research vessel, the Fay Slover.

“This is a top award from the NSF to junior faculty members,” said Mohammad Karim, the ODU vice president for research. Chris Platsoucas, dean of the College of Sciences, added: “The career award to Dr. Scully is more evidence that we are attracting top young researchers to the university and that oceanography is one of our specific strengths.”

Scully is the fifth ODU faculty member to receive an NSF career development award since the program began nearly 15 years ago.

Recent research by Scully has focused on the circulation and mixing between layers of salt and fresh waters in the Chesapeake Bay, which has long been plagued by periods of oxygen-poor, hypoxic water, the cause of which is most often attributed to pollution and excessive nutrients.

Nutrients such as sewage or nitrogen-rich fertilizer runoff can cause algal blooms that deny sunlight to the oxygen-producing seagrasses on the bay bottom. When the algae die, they sink and are decomposed by bacteria in a process that depletes the oxygen in the water.

But puzzling findings have come from measurements in the bay during the past decade. Extensive dead zones have persisted even after strides were made in pollution abatement.

Scully hypothesizes that reductions in the extent of hypoxia in the bay haven’t accompanied nutrient reductions because of subtle changes in wind patterns.

According to his project summary, wind-driven lateral circulation plays a key role in supplying dissolved oxygen to regions susceptible to hypoxia, and the effectiveness of this mechanism is strongly influenced by wind direction.

A model he has already developed shows that hypoxic zones are more extensive when summer winds blow out of the west and southwest. Winds blowing out of the southeast, on the other hand, help reduce the extent of hypoxic waters. The model shows that winds from the south and southeast are more effective because they force water from the deep hypoxic areas up onto the shoals where it is much easier to add oxygen.

“My research demonstrates that the size of the dead zone is very sensitive to summer wind direction and that over the last several decades the summer winds over the bay have been more favorable to large dead zones,” Scully said. “My work also shows that when you account for the variability in summer wind direction, the long-term trend in the observed size of the dead zone each summer is largely consistent with the estimates of nutrient inputs to the bay.

“This is important from a management point of view. It demonstrates that nutrient reduction strategies are helping to improve water quality. My work also highlights the inherent variability that is related to physical processes. Understanding this variability is important to how we make management decisions. For instance, if the public and resource managers feel that regulatory actions are having no impact, their views on how to regulate this resource may change.”

Scully, who is an assistant professor in Department of Ocean, Earth and Atmospheric Sciences and affiliated with ODU’s Center for Coastal Physical Oceanography, was named the 2009 winner of the Cronin Award for Early Achievement by the international Coastal and Estuarine Research Federation (CERF).
Virginia Gov. Bob McDonnell came to the Old Dominion University campus in April to sign bills promoting energy production and conservation in the state, and to reflect on his campaign promise - unveiled at ODU a year earlier - to make Virginia the energy capital of the East Coast.

He said the bills advance his goal of promoting energy independence and creating green jobs in Virginia, and will provide a boost for the work of the Virginia Coastal Energy Research Consortium, which is headquartered at ODU. Also at the signing ceremony were ODU faculty members Patrick Hatcher, the executive director of VCERC, and Larry Atkinson, who is a leader of VCERC's offshore wind energy initiative.

Hatcher’s work focusing on the production of biodiesel fuel from algae, as well as offshore wind energy studies by VCERC figure significantly in the governor’s plan to strengthen alternative energy options. McDonnell said, too, that he intends to push for increased production and efficiencies related to energy from traditional sources such as coal, gas and nuclear reactors. “This is an exciting partnership between traditional energy and renewables,” he said at a news conference.

The pre-signing program included comments by Secretary of Natural Resources Doug Domenech and State Senator Frank Wagner of Virginia Beach, a strong proponent of expanding Virginia’s energy options. Among the bills the governor signed were HB 803 and SB 623, creating green jobs tax credits, and HB 389 and SB 577, creating the Virginia Offshore Wind Development Authority.

McDonnell was back at ODU 10 days later to discuss his energy initiative during an address at the Energy Unplugged conference. The governor’s speech was the headline attraction of the daylong conference, presented by ODU’s Virginia Applied Technology and Professional Development Center.

Later in April, VCERC released a feasibility study endorsing wind farm construction off the Virginia coast. The 67-page report, which reflects 30 months of fact-finding and analysis by researchers affiliated with Virginia universities and industries, identified sufficient potential for offshore winds to provide 10 percent of Virginia’s annual electricity demand in high-wind zones 12 miles or more off the coast - beyond the visual horizon - on the Outer Continental Shelf (OCS).

Wind farms in these zones would have minimal conflict with other ocean uses, the researchers say. (The report is at www.vcerc.org/report.htm.)

“This report shows clearly that we have done our homework and that there is a need for expeditious action,” said ODU’s Hatcher. “I believe the report will change perspectives on the potential for offshore wind development in Virginia. Business and industry will benefit because we have done legwork that they normally would have had to do.”

Virginia, with its existing shipbuilding and port facilities, could become a producer of wind turbine components and a provider of wind farm construction and maintenance services, the researchers say. These enterprises could create thousands of jobs that could be sustained over the next 20 years if the 3,200 megawatts of near-term potential identified by VCERC is fully built out.