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# Virginia Scientists

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## A Message from VAS President Arun Verma



I would like to extend my thanks to the members of the Academy for electing me as the President of the Virginia Academy of Science for 2010-11. I am honored to lead this elite group of scientists and science educators from Virginia. It seems nowadays everything is accessible with a touch or a mouse click. The world is shrinking with the internet. We must not get lost in this information-rich world; we must stay active to enrich our own Academy base. The Academy's growth and success depends on you.

The Academy needs your support in increasing membership and participation. Please encourage your non-member colleagues to become members of the Academy, present their work at the annual meeting, apply for various research grants and awards that the Academy offers, and publish in the *Virginia Journal of Science*. Feel free to share your ideas to strengthen the Academy further with Council members.

The Academy has had another successful annual meeting. One highlight of this meeting was a proposed new Section. With the University of Richmond's Dr. Ellis Bell's initiatives, we piloted a new session on "Structural Biology, Biochemistry, and Biophysics." Our assessment is the session had a very positive response, and we look forward to formalizing this Section. With the advancement of technology, it is becoming a challenge to keep the Academy up-to-date. It is obvious that present-day research will involve more interdisciplinary work; in the future, mergers of existing Sections and sprouting of new Sections will occur. A successful meeting of the proposed new Section shows that we are ready to embrace such a transition.

I wish you the very best for upcoming 2010-11 year, and hope to see you at various Academy activities.

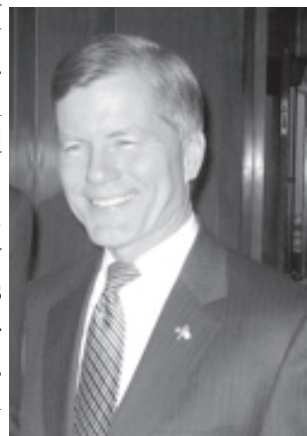
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## 2010 Virginia Outstanding Scientists Announced

Governor Bob McDonnell and Science Museum of Virginia Director Richard Conti announced the state's **Outstanding Scientists of 2010** and recipients of a new award — the **Governor's Award for Science Innovation**. The honorees were introduced at the Science Museum's General Assembly Reception on January 28th, which also honored the Governor, Lieutenant Governor, Attorney General, legislators, and other state officials.

"It is an honor to be standing among so many skilled scientists," McDonnell said. "This year's Outstanding Scientists have expertise in geological processes and how they affect us, shellfish diseases, and new methods for treating heart attacks. Recipients of the new award — the Governor's Award for Science Innovation — fill the gap between people who develop intellectual property and manufacturers. Their creativity, contributions and dedication will make a better Virginia, and a better America, for all of us."

"These awards give us a chance to recognize the people whose work and talent enrich our lives through science and improve our quality of life," said Conti.



(Continued, see "Outstanding Scientists" on page 2)

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# 2010 Outstanding Scientists, *(Continued from page 1)*

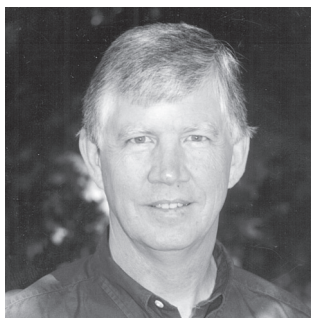


**Dr. Robert J Bodnar**

Virginia Tech

Dr. Bodnar is the C. C. Garvin Professor of Geochemistry and University Distinguished Professor at Virginia Polytechnic Institute and State University. He is internationally recognized as a leader in his field of fluid inclusions — tiny, microscopic droplets of fluid that are trapped in minerals when they form beneath Earth's surface.

He uses fluid inclusions to study natural geological processes, including explosive volcanic eruptions, to predict explosivity of future eruptions, and to explore for economically important mineral deposits of copper, gold, lead, zinc, silver, and uranium. Bodnar is currently working to create a scientific framework that will allow Virginians to understand the risks and benefits of uranium mining in the state. In 1999 he was part of a group that discovered liquid water fluid inclusions in a meteorite that fell in Texas. This represents the only unambiguous discovery of liquid water in an extraterrestrial sample.



**Dr. Eugene Bureson**

VIMS, William & Mary

Dr. Bureson is Chancellor's Professor of Marine Science for the Virginia Institute of Marine Science at The College of William and Mary. He is a world leader and pioneer in shellfish disease research. Bureson and his collaborators have broken ground in understanding two

oyster diseases that have catastrophically threatened the oyster industry in Chesapeake Bay and the mid-Atlantic states. These diseases are commonly called Dermo and MSX. He is also a leading expert on a third disease called Bonamia that became a concern during evaluation of non-native Asian oysters for restoration efforts in Chesapeake Bay. His efforts have been central in developing molecular diagnostic tools for shellfish diseases and in breeding disease-resistant native oysters. Bureson routinely shares his expertise with U.S. industry and regulatory agencies. His program works with and trains investigators from Europe, Africa, South America, New Zealand, and Australia.



**Dr. Rakesh C. Kukreja**

Virginia Commonwealth University

Dr. Kukreja is the Eric Lipman Research Professor in Cardiology at Virginia Commonwealth University School of Medicine and VCU Pauley Heart Center. He is a pioneer in devel-

oping therapies to minimize muscle damage following a heart attack. He has also invented a new use for erectile dysfunction drugs like Viagra, Levitra and Cialis. His work has demonstrated that Viagra reduced damage to the heart muscle following heart failure in mice. He has shown that Viagra protected the heart against injuries caused by the anticancer drug doxorubicin, and also has demonstrated that Viagra enhanced the anti-tumor effect of doxorubicin in mice. A clinical trial at VCU is being planned to demonstrate heart-protective and anti-tumor effects of Viagra in cancer patients. An NIH clinical trial is underway to demonstrate the benefit of Viagra in heart failure patients. Because of Kukreja's work ED drugs are now leading candidates for clinical application in cardiac bypass surgery, heart failure, resuscitation, hemorrhagic shock, and cancer.

## Governor's Award for Science Innovation



*Italo (left) and Joe (right) Travez*

Prototype Productions Inc. is a Northern Virginia business founded by two brothers — Italo and Joe Travez. PPI's approach goes from concept to commercialization. PPI has developed a variety of products including a personal biometric identification device, surgical simulators, a hazardous biological agent detector, and a next generation CT baggage inspection system. PPI collaborates with government laboratories and universities including Virginia Tech, University of Virginia, James Madison University, Johns Hopkins University, and George Washington University. PPI has been awarded several Small Business Innovation Research grants for products that will be used by the U.S. military. PPI Ventures is the company's in-house commercialization arm. Its current portfolio includes an online video delivery enhancement technology, a medical device for stroke victims, and a music-based social network innovation. PPI has also launched an aerospace division at NASA Goddard. PPI's youth leadership program "Innovation in Practice" inspires interest in science and engineering careers.

# Academic Freedom and Virginia's AG

*The Virginian-Pilot, Editorial, August 20, 2010, p. 6.*

*Reprinted with permission*

It's possible that law school students studying academic freedom will one day open their textbooks and find a picture of Virginia Attorney General Ken Cuccinelli.

That probably wasn't the outcome he had in mind when he served a civil investigative demand, similar to a subpoena, on the University of Virginia, seeking thousands of documents and e-mails related to Michael Mann, a climate scientist who served on the faculty before taking a post at Penn State.

But U.Va. attorneys seem determined to make the best of an irritating situation by turning it into a landmark constitutional case.

Warning that the subpoena places a "severe chill on academic freedom and scientific debate," the school argues that "the implications of this position are staggering in their breadth; according to the Attorney General, whenever an academic offers a disagreement with another academic's scientific conclusions, that disagreement opens the debate up to participation from the Attorney General's office in the form of a civil investigative demand."

Academic freedom isn't a new idea. It was recognized in a 1957 case in which the U.S. Supreme Court

*(Continued, see "Academic Freedom" on page 6)*

## Academy Seeks New *Virginia Scientists* Editor

... Your chance to make a  
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# SCHEV Outstanding Faculty Awards



The **Outstanding Faculty Awards** are the Commonwealth's highest honor for faculty at Virginia's public and private colleges and universities. The General Assembly and Governor created the OFA program in 1986. Now celebrating its 24th year, the award recognizes the finest among Virginia's college faculty for their excellence in teaching, research and public service. Since the first awards in 1987, a total of 290 Virginia faculty members - including the 2010 recipients - have received this high honor. In 2005, Dominion made a three-year commitment to support the annual recognition of the outstanding faculty in Virginia. Dominion Foundation renewed their commitment in 2007, extending their sponsorship through 2010.

ship through 2010.

This year, 12 faculty members—including two early-career 'Rising Stars' and one outstanding 'Teaching with Technology' designee—were selected from a highly competitive pool of 117 qualified candidates who were nominated by their peers at Virginia's public and private colleges and universities. At a February 18, 2010 celebration at the Jefferson Hotel, the OFA recipients each received a \$5,000 cash award underwritten by the Dominion Foundation and a commemorative engraved award.



**Romesh C. Batra,**  
Virginia Polytechnic Institute and  
State University

"I developed a passion for teaching and sharing knowledge with others during my high school and college days. I lived with my single elder brother in a large city in India rather than with my parents in a small town, since the nearest college was 15 miles away from my parent's house... I tutored my neighbor's children in return for home cooked meals, which is the only compensation they could afford."

Romesh C. Batra is the Clifton C. Garvin Professor of Engineering Science and Mechanics at Virginia Tech, where he has taught since 1994. His research focuses on the response of structures exposed to impact loads, such as those produced by improvised explosive devices, and is being supported by NSF, ONR, Army Research Laboratory, and private industries.

Dr. Batra received the 2009 Engineering Science Medal from the Society of Engineering Science (SES), the 2009 Lee Hsun Research Award from the Chinese Academy of Sciences, the 2000 Reissner Medal from the International Conference on Computational & Experimental Engineering and Sciences, and the Humboldt Award in 1992. The Humboldt is awarded to "outstanding scientists and scholars from outside Germany whose fundamental discoveries, new theories, or insights have had a significant impact on their own discipline and who are expected to continue producing cutting-edge achievements in the future."

Dr. Batra has mentored to successful completion 28 doctoral and 16 M.Sc. students. He has authored or co-authored over 340 papers in peer-reviewed journals, and has published a graduate-level textbook entitled *Elements of Continuum Mechanics*.

Dr. Batra earned his Ph.D. in Mechanics & Materials from the Johns Hopkins University in 1972.



**Maura Borrego,**  
Virginia Polytechnic Institute  
and State University  
*Rising Star Recipient*

"Even though I've taught some of these courses four times, they're always interesting, and I always learn something. This is more than a love of learning—it's finding a wide range of contributions interesting and worthy and modeling this for students."

Maura Borrego is Assistant Professor and Director of the Graduate Program in the Department of Engineering Education at Virginia Tech, where she has worked since December 2004. Her research interests focus on interdisciplinary faculty members and graduate students in engineering and science. Specifically, she has studied how engineering faculty members learn about and apply educational research methods to improve teaching. Her ongoing work focuses on learning in interdisciplinary graduate education programs.

All of Dr. Borrego's degrees are in Materials Science and Engineering. Her M.S. and Ph.D. are from Stanford University, and her B.S. is from University of Wisconsin-Madison. As a graduate student, she studied adhesion of polymer interfaces for microelectronic packaging applications, funded by a Semiconductor Research Corporation Fellowship.

Dr. Borrego was instrumental in getting Virginia Tech's Ph.D. in Engineering Education approved at the state level in 2007. She has developed and taught graduate level courses in engineering education research methods and assessment since 2005. She currently advises three engineering education Ph.D. students, and co-advises three other Ph.D. students in other departments.

(Continued, see "Outstanding Faculty" on page 5)

## Outstanding Faculty (Continued from page 4)



**Mark Patterson,**  
College of William & Mary  
*Teaching with Technology Recipient*

"I noticed that students sat up and paid close attention when science was taught in the context of a story or adventure that happened in the field. I am lucky that I have had several opportunities to experiment with telepresence from the field to bring expeditionary science alive to a remote audience."

Mark R. Patterson is Associate Professor of Marine Science at the College of William & Mary, where he has taught for 16 years. He directs the Autonomous Systems Laboratory at the Virginia Institute of Marine Science. In 1996, he received the Phi Beta Kappa Award for the Advancement of Scholarship for his work on how corals feed and respond to water currents. In 2008, Dr. Patterson was honored with the Lockheed Martin Award for Ocean Science & Technology for the "highest achievements in the field of ocean science and engineering," specifically his sustained creativity in the field of underwater robotics, a discipline he helped create.

Dr. Patterson is an underwater explorer, inventor, and entrepreneur. A world-class scientist with 37 publications and two patents, he is a gifted teacher who uses technology to engage students in the excitement of exploration and discovery. The robots he developed, Autonomous Underwater Vehicles (AUVs), are revolutionizing oceanography and underwater national defense. While using his robots for cutting-edge research on the health of marine ecosystems from the Chesapeake Bay to Antarctica, Dr. Patterson co-founded a small business, Sias Patterson, the first company to sell small AUVs. This created jobs in the Hampton Roads area, including significant downstream effects at Northrop Grumman, the region's largest private employer.

Dr. Patterson received his A.B. *magna cum laude*, A.M., and Ph.D. from Harvard.



**Doyle Temple,**  
Hampton University

"I think I built nearly every Radio Shack electronics kit they made when I was 12 years old. I drooled over the electronics kits in the Health Kit catalogs but they cost much more than my neighborhood grass mowing jobs could handle. As my mother used to say, 'You don't have a bedroom, you have a workshop.'"

Doyle A. Temple is Professor of Physics and Chair of the Department of Physics at Hampton University, where he has taught for almost 16 years. After becoming Chair of the Department in 1994, he was instrumental in guiding the new Physics Ph.D. program that was established in

1992; it was the first Ph.D. program at Hampton University. Before joining Hampton University he was an Assistant Professor of Physics at Louisiana State University in Baton Rouge for six years.

Dr. Temple has served as the Director of three major research centers: the Research Center for Optical Physics funded by NASA, the Center for Lidar and Atmospheric Sciences funded by NASA, and the Center for Laser Sciences and Spectroscopy funded by NSF. Dr. Temple has also served as principal investigator or co-principal investigator on projects totaling more than \$20 million dollars in research and education grants. He is author or co-author of over 80 publications and conference presentations in refereed journals and conference proceedings. He is also the inventor on a patent for holographic data storage using cylindrical media.

Dr. Temple earned his B.S. in physics from Southern University and his Ph.D. in physics from the Massachusetts Institute of Technology.



**Lennis G. Echterling,**  
James Madison University

"I like to think of every encounter I have with a student as a spontaneous seminar, which is derived from the Latin word for 'seed plot.' In the final analysis, I see my teaching as carrying on my family's simple, vital tradition of planting seeds, cultivating growth, and waiting patiently for the harvest."

Dr. Echterling's books include *Crisis Intervention: Promoting Resilience and Resolution in Troubled Times*, *Thriving! A Manual for Students in the Helping Professions*, *Beyond Brief Counseling*, and *Becoming a Community Counselor*.

Lennis G. Echterling has been Professor of Counseling Psychology at James Madison University for over 23 years. His approach to teaching has been to reduce the barriers between the classroom and the community, between theory and practice. Every semester, he involves students in providing thousands of hours of service in applying psychology to real-world problems. In particular, Dr. Echterling has mobilized faculty and students to provide psychological services in more than a dozen catastrophic events.

He has provided crisis and disaster intervention services in the US, including Mississippi and Texas after Hurricanes Katrina and Rita, and other countries, including India after the 2004 tsunami. Since 2003, Dr. Echterling, along with colleagues and students, has provided play-based therapeutic services to the children of mobilized Virginia National Guard members.

(Continued, see "Outstanding Faculty" on page 6)

## Academic Freedom *(Continued from page 3)*

opined that "the essentiality of freedom in the community of American universities is almost self-evident." Indeed, it was so self-evident that the justices didn't feel obliged to define it.

U.Va. law professor Richard Schragger and *Slate* senior editor Dahlia Lithwick argued that the case is an opportunity for the courts to assert that academic freedom covers professors as well as universities. The case could also be a vehicle for clarifying that public universities and professors don't give up their freedom because they collect public funds.

"Whatever the judicial doctrine of academic freedom may mean, at its heart it must protect those exercising core First Amendment rights -- like researching, writing, speaking and teaching. If government officials are allowed to dictate how the faculty exercises those rights, they are surely impinging on free speech," Schragger and Lithwick write.

Before constitutional scholars get into a lather, one crucial caveat is necessary. There's a chance this case will never require a ruling on academic freedom because it might be tossed. Although the attorney general justifies his actions by saying he is trying to enforce a state anti-fraud law, Mann received only one state grant. It was awarded before the statute took effect.

## Outstanding Faculty *(Continued from page 5)*

Among the Outstanding Faculty honorees are the following from other disciplines:

**Terry Alford**-Professor of History  
**Northern Virginia Community College**

**Teresa Keller**-Professor of Mass Communications  
**Emory & Henry College**

**Paul Marcus**-Haynes Professor of Law  
**College of William and Mary**

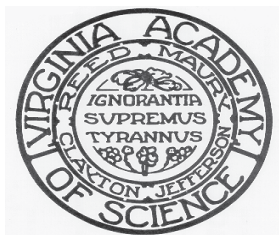
**Ellen Mayock**-Professor of Spanish  
**Washington and Lee University**

**J. Peter Pham**-Associate Professor of Justice Studies, Political Science, and Africana Studies  
**James Madison University**  
*Rising Star Recipient*

**Lisa Russ Spaar**-Professor of English and Creative Writing  
**University of Virginia**

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