Progress at the Speed of Light
Dear Alumni and Friends,

Now is a critical moment in time for the future of the School of Engineering and Applied Science.

University of Virginia President John T. Casteen III has identified engineering and the sciences as among the highest priorities for the advancement of the University. This invitation to greater prominence, together with the Board of Visitors’ initiative on the enhancement of engineering and the sciences, creates a time of unique opportunity for the Engineering School.

Nationally, the president of the United States issued a similar call when he highlighted the importance of advancement of research and education in nanotechnology, supercomputing and alternative energy sources in this year’s State of the Union Address.

And, as we face global problems, the world increasingly calls for a cadre of superbly educated, morally grounded leaders in the field of engineering.

Our Engineering School is answering the call. In hiring National Academy faculty such as Joe Campbell and Toby Berger, in endowing our faculty, in providing opportunities for interdisciplinary research at the graduate and undergraduate levels and in retrofitting existing buildings and constructing new ones to create an optimal research environment, we are seizing this critical moment in time to achieve greater prominence for U.Va. Engineering.

The energy and momentum surrounding the School are obvious, visible not only to those who pass through Thornton Hall but to all who walk Mr. Jefferson’s Grounds. As you flip through the pages of this magazine, take the time to read about Dean Aylor’s vision for our School—and learn more about Joe Campbell and other outstanding faculty, our students and our accomplished alumni. You, too, may begin to sense the momentum of the U.Va. Engineering School.

In this exciting transformation, it is vital that the Annual Fund for Engineering keep up with the demands of our enhanced and growing institution. We ask that you consider making a gift to the Annual Fund to support the programs and opportunities that make our School great. With your support, the School could fund a scholarship for a deserving student, new lab equipment, a stellar faculty member or a special research or travel opportunity.

Thank you, alumni and friends, for your continued interest in and support of the University of Virginia Engineering School. Your comments—as well as your contributions—are always welcome!

Sincerely,

Doug Garson (ChE ’78)  Andy DuPont (ME ’77)
President, SEAS Trustees  First Vice President, SEAS Trustees
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Front cover photo by Tom Cogill:
A probe station used to measure the electrical characteristics of detectors in Joe C. Campbell’s lab
The University of Virginia’s rise to preeminence in the last decade has reflected the excellence of its liberal arts and professional programs. There is a growing consensus around Grounds that if U.Va. is to continue on this path, it must achieve equal eminence in science and engineering.

You don’t have to go far to understand the reasons for this. Advances in technology will be absolutely essential if we are to confront the extraordinarily complex challenges of our age—the care of an aging population, the threat of environmental disaster, the constant vigilance required for global security, the need to maintain our economic vitality in the face of new competitors.

Our ability to respond successfully to these challenges will require leaders who are highly educated in science and engineering and who can deploy a range of powerful technologies.

This situation creates an extraordinary opportunity for the Engineering School. It is now up to us to attain an unprecedented level of excellence in our educational and research programs, while retaining the distinctive character of the School’s historic mission.

This is a complex and, quite frankly, costly undertaking. First and foremost, it will require significant investment in people. We must be able to compete for National Academy-level faculty who can instantly put our programs on the map. We must be able to secure highly regarded young faculty and nurture their careers in the Engineering School. And we must be able to attract bright young graduate students who otherwise might go to MIT, Duke or Caltech.

It will also require an investment in equipment, facilities and infrastructure. Cutting-edge research requires cutting-edge equipment. A typical start-up package for new faculty runs $500,000 or more, and the price tag on equipment such as a nuclear magnetic resonance spectroscope can exceed $1 million.

Finally, this initiative also will require us to rethink and expand our educational mission. We must address the needs of our undergraduates for internships and other programs that prepare them to succeed in a global engineering environment. We must also step forward to promote technological literacy throughout the University, ensuring that students in Arts & Sciences are as broadly educated in technology as our engineering students are in the humanities.

This is an undertaking that is ambitious and necessary. It is also an exciting opportunity for those who know and love the Engineering School. With your support through our capital campaign, we will transform SEAS, building on our strengths to provide the leadership and the knowledge that’s so important to the long-term well-being of the University and of society at large.

JAMES H. AYLOR
Louis T. Rader Professor
Dean of the School of Engineering and Applied Science
Every second that passes, untold trillions of light pulses carry voice and data traffic through the worldwide telecommunications network, yet the telephones, computers and other devices at the end of the line are, for the most part, electronic. Newly appointed faculty member Joe C. Campbell was instrumental in devising the critical component, called a high-speed avalanche photodiode, that changes photonic signals into electronic signals extremely quickly, reliably and with very little noise or distortion. For this achievement, Campbell was named to the National Academy of Engineering.

This year, Campbell joined the University as the Lucien Carr III Professor of Engineering and Applied Science at the University of Virginia in the Charles L. Brown Department of Electrical and Computer Engineering. His appointment is the first in a Board of Visitors’ initiative to raise the standing of science and engineering at the University by bringing 10 researchers of National Academy caliber to Grounds. “We are seeking researchers who have the capacity to transform reality—to vastly improve the quality of life at all levels of society with their inventions and discoveries,” comments Ariel Gomez, vice president for research and graduate studies. “Joe Campbell is a researcher of this caliber.”

Better Detectors, More Wavelengths

Campbell brings with him an extensive research agenda—and a team of graduate students and postdoctoral fellows to push it forward. “Essentially, everything we do involves converting light into large electrical signals,” he says. Campbell has projects under way that span the light spectrum, from ultraviolet to infrared. For instance, he is working with the Defense Advanced Research Projects Agency to create highly sensitive detectors that can pick out the characteristic ultraviolet signature of a missile plume in the midst of the radiation that pours from the sun. Such detectors might also be adapted to pinpoint airborne biological agents. Certain biological compounds fluoresce when excited by an ultraviolet laser. “If you could look at...
emissions at two or three wavelengths and evaluate the ratio of signals, you could get a sense of the type of biological agent that is in the air,” Campbell says. These detectors could be used in buildings and public spaces, as well as on the battlefield.

Campbell is also exploring the possibility of developing a communications system that turns a drawback of ultraviolet light—its tendency to scatter—into a virtue. Because it scatters, ultraviolet light could carry signals around a corner, but receivers would have to be extremely sensitive to pick them up. Campbell and his students are working to achieve that level of sensitivity, setting the stage for short-distance, non-line-of-sight communications.

On the other side of the spectrum, Campbell is involved in a collaborative effort to create a new way of detecting infrared radiation. Current systems used for night-vision goggles and military tracking devices have detectors based on mercury cadmium telluride, an excellent detector but a difficult compound to work with. Campbell’s approach is to use quantum dots: minute pyramid-shaped collections of semiconductors that allow electrons to be uniquely trapped and measured. “We are hopeful that this technology will ultimately displace mercury cadmium telluride,” Campbell says. “We can now detect pretty easily in the 8- to 12- micron range. In the meantime, we are learning a lot of science—and that in itself is exciting.”

Improving the Signal-to-Noise Ratio

The critical challenge in developing faster, more sensitive avalanche photodiodes is managing the signal-to-noise ratio. Depending on the application, Campbell feels free to work on both elements of the ratio. Much of the noise produced by current photodiodes is created by the random nature of the amplification process. The number of electrons produced by a single photon is variable. To reduce noise, Campbell and his students are developing detectors that provide more consistency in amplification.

Another approach to increasing the signal-to-noise ratio is to increase the power of the signal, but this approach causes the bandwidth to degrade. Two of Campbell’s graduate students developed new photodetector structures that can accommodate the additional power. Such detectors could be used to link the remotely phased array antennas used in satellite communications.

Looking for the Next Big Challenge

These are but a sampling of the projects that Campbell is orchestrating. Their sheer breadth and number underscore the energy and creativity that underlie his success. Campbell’s decision to come to U.Va. after 17 years at the University of Texas is yet another reflection of a lifelong affinity for new challenges. “Things had gone well for me at Texas,” he says. “I was very comfortable there. I thought I could use the disruption of coming to U.Va. to form new collaborations and move in new directions.”

And make no mistake about it, it was a disruption. In
December 2005, Campbell and his students disassembled a $3 million laboratory weighing more than 44,000 pounds and reassembled it in Charlottesville. It was up and running by mid-February, and the first publishable results from research conducted at U.Va. have just been gathered.

The determining factor in Campbell’s decision to come to U.Va. was the commitment that the University has demonstrated to building world-class programs in science and engineering. “I’ve long known of U.Va. as a special place and a first-rate university,” Campbell said of his reasons for coming to Virginia. “What particularly impressed me was the University’s vision for the future in research and the energetic initiatives in place to move up in the rankings. I want to be a part of that.”

Campbell’s decision marks the beginning of a new era at U.Va. As University President John T. Casteen III notes, “The hiring of Joe Campbell is the first step in a strategy to transform scientific research here and to position the University of Virginia as a preeminent research institution in science and engineering.”
In receptions held across the country, Dean Aylor is sharing his vision for the Engineering School with SEAS alumni and friends. The dean brought with him news of progress—the hiring of “star” faculty Joe C. Campbell and Toby Berger, new partnerships with universities in Brazil and with China and the School’s growing momentum in fields like nanotechnology and biomedical engineering.

The dean’s tour began in December, when he hosted a holiday celebration in Richmond. In January, Dean Aylor trekked to Atlanta, where SEAS leaders and alumni welcomed him with open arms. In February, the Dean’s schedule included stops in Raleigh, Charlotte, Wilmington and Baltimore as well as a stop back home in Charlottesville. In March, Dean Aylor headed out West with visits to Seattle, San Francisco and Palo Alto and then returned to his native Virginia, where he joined alumni for receptions in Harrisonburg, Lynchburg, Roanoke and Tidewater. In April, the dean rounded out his spring visits with trips to Washington, D.C.; Houston; and Boston.
As he prepares to celebrate the first anniversary of his appointment as dean of the School of Engineering and Applied Science, James H. Aylor is leading the School to a new era of growth in research and education. Awarded three degrees in electrical engineering from the Engineering School—in 1968, 1971 and 1977—Aylor is uniquely positioned to help raise the School’s profile throughout the University and across the nation. In this interview, he talks about his vision for U.Va. engineering, both today and 10 years from now.

**President John T. Casteen III has said that strengthening the University’s programs in science and engineering will be critically important over the next 10 years. What will this mean for the Engineering School?**

These days the technology industry dominates much of the U.S. economy. Many of the issues our nation faces, especially those related to energy and the environment, will be solved with technology’s help. Even Americans who aren’t trained as engineers may well wind up working for a technology company at some point in their careers. Thanks to the leadership of John Casteen and the Board of Visitors, U.Va.’s humanities programs have long been considered among the finest in the nation. But if we hope to increase our stature as a university, we must also be a place where innovators in the sciences and engineering can thrive.

**What will it take for the Engineering School to become a national leader?**

It will take substantial additional resources, of course. The University is doing what it can by directing half of the revenues it receives from tuition increases to faculty salaries. This will provide us with more funds to attract additional
teachers and researchers and to retain the talented scholars who are already members of our faculty. The University is also working to help us locate new funding sources. Our goal is to attract approximately $100 million in external research funding, and we’re already halfway there.

**How will the Engineering School change over the next decade?**

In order to see where we’re going, we have to understand where we’ve been. As a state institution, we have a historical emphasis in undergraduate classroom education, and we are very strong in this area. For the past 20 years, we have also been working hard to increase our research and graduate education, and—more recently—we have been pushing to get our undergraduates involved in research. Ten years from now, we will be widely recognized for our undergraduate and graduate education and for our research programs. Growing our research capabilities will help to enrich the entire School. Not only does research help to attract more highly talented faculty and make life better for those who are already building careers here, but it also enables us to recruit better-qualified students at all levels.

**Will the Engineering School grow?**

We are planning for modest growth. We expect to increase our number of tenure-track faculty from 150 to 175 and the number of undergraduate students from 2,000 to 2,200. We need to increase the size of the faculty concomitantly to preserve, as much as possible, our 14:1 undergraduate student to faculty ratio. But even modest growth will require major changes to our facilities. In addition to the information technology engineering building currently on the drawing board, I expect we will be planning another facility behind Thornton Hall—probably devoted to energy, the environment or some other aspect of the macro-engineering business.

The line between traditional engineering disciplines has begun to blur in recent years as scholars and researchers from departments within the School and across the University find new opportunities to work together. What types of collaborations do you foresee?

A comprehensive university offers many opportunities for collaborative research. Here at U.Va., our moderate size and supportive atmosphere make unique collaborations possible. Because we are not a massive institution focused exclusively on technology, pan-University collaborations are not only helpful, but necessary. We’ve been able to build a strong biomedical engineering program, in part because our teaching hospital is located on-site and hasn’t been privatized. As demand grows for new medical technologies, I imagine that this successful collaboration will continue to flourish.

Looking further ahead, I envision collaborations between the Engineering School and the schools of medicine, business, architecture and commerce and between electrical and biomedical engineering, computer science and bioinformatics as our population continues to age and citizens demand new products and services to assist them. In my view, some of tomorrow’s most interesting problems will occur at the boundaries of traditional engineering disciplines.

**Tomorrow’s engineering graduates will work in a much more global environment. How is the Engineering School preparing students for the challenges they will face?**

Our undergraduates should be able to gain international experience while they are enrolled at the Engineering School. We can help them arrange internships with international universities, co-ops and other types of study-abroad opportunities—provided we can navigate the scheduling problems. It is my hope that, by arranging internships with multinational corporations as well as with foreign universities, we can add value to our engineering degree.

You’ve been traveling around the country in recent months meeting with groups of alumni. What have you learned?

As an alumnus, I am continuously reassured, because no matter what careers alumni have chosen, they are grateful for the education they received in the Engineering School. They appreciate its structure, particularly in the first year, but they also find benefit in the fact that it is not all technical in nature, that it offers a well-rounded experience. It’s clear to me that we’ve got it right. We continue to attract outstanding students who are looking for a quality education, and we offer them exactly what they came for.
Toby Berger
Professor, Charles L. Brown Department of Electrical and Computer Engineering
Research interests include information theory, communications, neuroinformation theory, radar/sonar, data and video compression and signal processing.

Silvia S. Blemker
Assistant Professor, Department of Mechanical and Aerospace Engineering
Research interests include multi-scale mechanics of muscle, image-based musculoskeletal modeling and movement disorders.

Benton H. Calhoun
Assistant Professor, Charles L. Brown Department of Electrical and Computer Engineering
Research interest is on low-power VLSI design and the impact of process scaling on memory circuits and architectures.

Joe C. Campbell
Professor, Charles L. Brown Department of Electrical and Computer Engineering
Research interests include avalanche photodiodes, semiconductor lasers, optical modulators, wave guide switches and photonic integrated circuits. [See story on page 3.]
Ginger M. Davis
Assistant Professor, Systems and Information Engineering Department
Research interests are evolving structure in multivariate time series, multivariate time series analysis with multiple data types, nonlinear time series and outlier detection in spatiotemporal data.

Gregory J. Gerling
Assistant Professor, Department of Systems and Information Engineering
Research interests include haptics, human factors/ergonomics, computational modeling of skin tissue and neural mechanotransduction and human-machine interaction.

Avik Ghosh
Assistant Professor, Charles L. Brown Department of Electrical and Computer Engineering
Research interests are transport in molecular wires and in carbon nanotubes and device physics.

David Green
Assistant Professor, Department of Chemical Engineering
Research interest is in the synthesis of well-defined nanoparticles, their dispersion into polymer solutions and melts and their suspension rheology.

Sudhanva Gurumurthi
Assistant Professor, Department of Computer Science
Research interests include computer architecture and storage systems.

Kim Hazelwood
Assistant Professor, Department of Computer Science
Research interests include optimizing compilers, computer architecture and binary modification.

Richard W. Kent
Assistant Professor, Department of Mechanical and Aerospace Engineering
Research interests are injury biomechanics and characterization of biological structures.

Steven McIntosh
Assistant Professor, Department of Chemical Engineering
Research interests include the fields of fuel cells, catalysis, solid-state ionics and electrochemistry.

Nina Mishra
Associate Professor, Department of Computer Science
Research interests include the design and analysis of algorithms for unearthing patterns in massively large, dynamic datasets.

Westley R. Weimer
Assistant Professor, Department of Computer Science
Research interests include advancing software quality by using both static and dynamic programming language approaches.

Julie B. Zimmerman
Assistant Professor, Department of Civil Engineering
Research interests include green chemistry and engineering to advance sustainability in both the developed and developing worlds.

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Researcher Chris Sherwood of the U.Va. Automobile Lab co-authored a report on child car seat safety with Basem Henary (MAE) and Jeff Crandall (MAE). Their study found that children under age 2 in forward-facing car seats are more than four times as likely to be injured in side crashes than children of the same age who are in rear-facing car seats. Sherwood presented the study at the American Academy of Pediatrics Conference in Washington, D.C., in October 2005. The study was funded by the Centers for Disease Control and Prevention (CDC) as part of a project to investigate the benefit of having children older than 1 year of age remain in rear-facing car seats.

The Virginia Economic Development Partnership Tours SEAS

The Virginia Economic Development Partnership, a department of the Commonwealth's Secretary of Commerce, learned about U.Va. research in morphogenesis and organogenesis, cardiovascular medicine, chemistry and pathology, materials science and ultrasound technology during a recent tour to explore the potential for attracting high-tech industry to the Charlottesville-Albemarle area.

The visit included a breakfast hosted by Ariel Gomez, vice president for research and graduate studies, and tours of several key labs in the Medical Center and Engineering School, as well as the Institute for Advanced Technology in the Humanities.

In February, the National Science Foundation Partnerships for Innovation program made a two-year, $600,000 award to six schools in Virginia for shared graduate engineering courses in nanotechnology.

The program will involve the College of William and Mary, George Mason University, Old Dominion University, the University of Virginia, Virginia Commonwealth University and Virginia Tech.

Starting in January 2007, the six schools will use distance-learning technology to share—with one another and with working engineers in Virginia—six graduate courses per semester in nanotechnology ranging from nanoelectronics to nanobiotechnology.

Faculty News On the Web

Read more about SEAS Faculty at www.seas.virginia.edu/seas/publications/spring06/facultybriefs.html
Eyes Open: SEAS Alum Takes Technology to ‘ER’

Some huge companies compete for the privilege of paying millions of dollars for product placement on hit shows. But for one local company, a hit NBC television show came calling and didn’t ask for a dime. “The people from ‘ER’ called right before Thanksgiving,” says Chris Lankford (EE ’99, SIE ’02), chief technology officer of Eye Response Technologies, a company that manufactures a system that allows people to communicate through eye movements.

The Eye Response technology—a computer and voice synthesizer that can attach to a wheelchair—has found a burgeoning market among individuals suffering from ALS, a degenerative neurological disease that invariably leads to paralysis, loss of speaking ability and death. In addition to helping people communicate through eye movements, the technology is successful in a number of areas including early diagnosis of autism, ADD and areas of psychology.

Professor Emeritus Thomas E. Hutchinson was associate dean in the Engineering School when he invented the technology, and Lankford was his Ph.D. student. “Much of the success of the invention and the new applications to which it is applied was made possible by more than 200 undergraduates who worked on this, often as part of their senior thesis,” Hutchinson said. “None of the current advances would have been possible without Chris Lankford leading the intellectual charge and the support of Blair Kelly and Greg Olsen who provided both financial investment in the company and, more importantly, a belief that we could succeed in helping so many in most desperate need.”

Hutchinson is now University Professor at the College of Charleston School of Science and Mathematics. [This story first appeared in The Hook.]
Making a Difference, Making it Matter

Thirst Relief Through Research and Engineering Applications in Bushbuck Ridge, Mpumalanga Province, South Africa

“We found ourselves to be a small piece of a much larger puzzle, attempting to comprehend the complex historical background required to contribute to the ongoing development in the area.”
—Peter Stapor and Kathleen McDowell

With support from alumni donations, two second-year engineering students participated in a two-month Thirst Relief Through Research and Engineering Applications Project in Bushbuck Ridge, Mpumalanga Province, South Africa, last summer. There they engaged in a service-learning course with students from South Africa’s University of Witswaterstrand and University of Venda for Science and Technology.

Throughout the project, the students worked in rural communities, assessing water provisions and determining feasible ways to improve situations, among them the construction of rainwater harvesting systems in schools that desperately needed a supplemental water source for drinking and gardening.

The students received a great deal of planning support from the SAVANA consortium, in particular from U.Va. designated liaison Robert Swap. Other support came from SEAS alumni through the University of Virginia Engineering Foundation and from the Center for Global Health, the Office of the Vice President for Research and Graduate Studies, the Rodman Scholars Foundation, the International Studies Office, Engineering Students Without Borders, the University Giving Tree and several private donors.

“This trip was truly life-changing on personal and educational levels for both of us,” the students wrote noting their appreciation for the financial support from alumni. “We feel lucky to be part of an E-School community that values unique undergraduate experiences.”
Students Explore the Relationship Between Technology and Citizenship

“As a society, we live embedded in technological systems. It follows then that anyone who is going to play a leadership role needs to understand the way technology is shaped by, and in turn shapes, that larger social environment.”

—Professor Kay Neeley (STS)

Twenty-four undergraduates from Arts & Sciences and the schools of engineering and architecture spent J-term (the interlude between semesters) this year studying the history, infrastructure and culture of New Orleans, first in the classroom and then in the center of hurricane devastation.

The students spent the first four days of their course at U.Va. learning about the city of New Orleans before, during and after Hurricane Katrina from the viewpoints of the architect, the engineer, the scientist and the historian. Then they boarded a train for New Orleans and spent a week engaged in relief efforts.

The students were required to keep a journal throughout the course, which is posted online (www.virginia.edu/topnews/releases2006/NewOrleansJournals.html). The final project required them to develop a plan for rebuilding the city. Some of the students have continued their involvement beyond the end of the term. Justin Starr and several other students have started a charity called “Horns for Hurricane Victims” that ships musical instruments to area schools in New Orleans.

The J-term course, which was cross-listed in architecture, engineering and the College, is part of a University-wide initiative to explore the relationship between technology and democracy, with the goal of engaging faculty and students in thinking about how technology can be managed in accordance with democratic principles.

The Brazilian Connection

“I saw this as an opportunity to throw myself a curve ball. Challenges in the future will appear much more manageable to me.”

—Alex Rixey (’06)

As one of two American partners in the U.S.-Brazil Cognitive Systems Engineering Exchange Program, the Department of Systems and Information Engineering offers U.Va. students a unique opportunity to understand cross-cultural issues while conducting hands-on research.

Students spent six months in Brazil immersing themselves in the language, getting to know their Brazilian counterparts, attending classes and researching issues related to the intersection of people and computers. At the end of six months, the entire group, Brazilians as well as Americans, returned to the United States to complete their projects.

Working side-by-side in Brazil with students from the Universidade Federal do Rio de Janeiro, the Universidade Federal do Rio Grande do Sul and The Ohio State University, U.Va. students took on a number of projects, among them creating an analysis toolkit to help Petrobas, the Brazilian state oil company, pull critical information from its incident-reporting system and identifying specific improvements for a training simulator used by Brazil’s Nuclear Energy Institute.
1940s
Albert H. Small (ChE ‘46), a former Board of Visitors member, was featured Sunday in the *Palm Beach Daily News* article, “Celebration of Generosity: Community Foundation for Palm Beach and Martin Counties Toasts Philanthropists Shirley and Albert Small.”

1960s
Winfred Phillips (Aero ’66, ’68), a member of the SEAS Trustees, was awarded the Ralph Coats Roe Medal from the American Society of Mechanical Engineers in November 2005.

1970s
Nancy Dicciani (ChE ’70) received the 2005 U.Va. Engineering Foundation Distinguished Alumni Award and has been ranked one of “The World’s 100 Most Powerful Women” by *Forbes* magazine for the past two years. She is president and CEO of Honeywell Specialty Materials.

Jerry Tuttle (Applied Math ’74) was appointed senior vice president of Platinum Underwriters Reinsurance in New York City.

Dwight E. Baker (EE ’77, ’78) is on the staff of MITRE Corp. and assigned to the Homeland Security and Intelligence Analysis Department. He is responsible for issues relating to commercial nuclear energy facilities.

Peter Quick (CE ’78) was appointed to the board of Medicure Inc., a cardiovascular drug discovery and development company.

Katherine Ichter (CE ’79) was named director of the Fairfax (Va.) County Department of Transportation.

When Adam Malcom (M.S. MAE ’06) set out to design a new life jacket, he asked himself a simple question: What would he be willing to wear?

His answer—a slender belt from which a series of inflatable bladders deploy when necessary—was the first-place winner of an international competition sponsored by the Boat U.S. Foundation for Boating Safety and the Personal Flotation Device Manufacturers Association.

Growing up in northwest Ohio, Malcom and his family spent considerable time boating on Lake Erie, and his passion for boating has continued. “My parents made us wear life vests when we were kids,” he says. “Once I got my own boat, though, I rarely wore one. They’re uncomfortable, extremely hot, dorky-looking and significantly lacking in maneuverability.”

With that in mind, Malcom imagined a device that would exhibit the opposite characteristics—comfort and maneuverability—in addition to being unobtrusive and reliable.

His winning design is a slender belt in which a CO₂ gas cylinder inflates 16 stored-air bladders that emerge from the belt. The blaze-orange bladders are arranged symmetrically around the belt and unfurl much like party noise makers, rising from the belt to surround the wearer under the arms and provide buoyant support. Other devices hold the bladders into place around the user.

“There are two ways to trigger the bladders,” Malcom explains. “One is manually with a rip cord; the other is with a pressure-operated sensor already in existence that will activate the CO₂ cylinders when the user is fully submerged in the water. This is vital for those who might potentially fall into the water unconscious due to an accident.”
B. Aubrey Huffman (left) and Henry L. Kinnier

B. Aubrey Huffman (CE ’51) celebrated his 80th birthday in December at the Charlottesville Elks Club.

Henry L. Kinnier (CE ’42) celebrated his 90th birthday with a party in the Colonnade Club in December. Among the highlights was the reading of a letter from the Seven Society thanking him for his love of the University and for “a life of kindness and service.”

John L. Owen (Engineering Science ’39) received balloons and an enthusiastic rendition of “Happy Birthday” in honor of his 90th birthday at a reception for Dean Aylor that was held at Farmington Country Club in March.

1980s

William P. Utt (ME ’79, ’80), a member of the SEAS Trustees, was named president and CEO of KBR, the engineering and construction subsidiary of Halliburton.

Stephen S. Bell (CE ’83), a captain in the U. S. Navy, serves as assistant chief of staff and engineer for the Multinational Security Transition Command in Iraq.

H. Christopher Frey (MAE ’85) is a professor of environmental engineering in the Department of Civil, Construction and Environmental Engineering at North Carolina State University.

Debbie Greenstreet (EE ’81) is director of service provider strategy for Texas Instruments.

B. J. Haberkorn (EE ’87) is a strategic relations manager in Intel’s Microsoft program office in Seattle.

2000s

Steven L. Huffman (CS ’05) and Alexis K. Ohanian (Comm ’05), who started their own company while still undergraduates, were recently featured in the Boston Globe article, “The Ladder Isn’t the Only Way Up. Ohanian and Huffman are the founders of Reddit, a source for what’s new and popular online.”

Francesco Viola (BME ’05) received the inaugural TETHIC Scholarship Award from the Emerging Technologies and Healthcare Innovations Congress in December. Viola is a research associate in the Department of Biomedical Engineering and president and co-founder of Hemosonics LLC.

James Turner, a member of the SEAS Trustees, received the Melvin L. Green Codes and Standards Medal from the American Society of Mechanical Engineers in November 2005.
Raynelle N. Callender (SIE ’02), a sales manager for Rolls-Royce, was a nominee for the Black Engineer of the Year Award, which is sponsored by the Career Communications Group Inc., and was selected as a Modern Day Technology Leader. Callender joined Rolls-Royce in June 2002 through the company’s Customer Business Leadership Development Program. “I chose Rolls-Royce because the company provides the engineering component, while allowing me to focus on the business side. It is the perfect fit,” Callender says. She is equally enthusiastic about her experience at U.Va. and says that the systems engineering education she received was key to her professional success. “Often you wonder if you will ever use some of the things that you study, but I do.” Callender did her capstone project for VDOT on improving roadway lighting. She says that the teamwork and customer interaction skills she learned during that project are the same skills that she uses now in her job.

Callender is campus manager for Rolls-Royce’s recruitment efforts at U.Va. and takes the opportunity when she is in town to visit a place that was once a home away from home. “Carolyn Vallas and the Center for Diversity in Engineering made a significant impact on my experience at U.Va. Carolyn was very involved and supportive, and she is still a great influence,” Callender says.

Brigette K. Hoyer (SIE ’05), a former Science and Technology Policy Washington, D.C., intern, was on hand to help out in Mississippi after Hurricane Katrina through her work with International Relief and Development Inc. (IRD). She spent six weeks there evaluating needs, setting up the IRD office and distributing goods such as water and bicycles.

Luna M. Magpili (SIE ’03) conducted assessments in informal settlement areas in Manila following the December 2004 Indian Ocean tsunami. Efforts include a proposal for the improvement of water and sanitation facilities and hygiene education for public schools.

Alumnae to the Rescue:
Hoyer and Magpili Serve with IRD

A SEAS Success Story:
Raynelle N. Callender
in memoriam

John T. Smith (CE '52) of Virginia Beach, Va., died in October 2005.

Charles R. Huddle III (Engr. '61) of Providence, R.I., died in February 2005.

Clement D. Urban (Nuc '76) of Torrance, Calif., died June 2005.

Robinson S. Brown Jr. (Engr. '40) of Harrods Creek, Ky., died in July 2005. He was retired as chairman of the board of the Brown-Forman Corp. He served on the board of the National Association of Manufacturers and was chairman of the board of trustees for Bellarmine College.

Eugene C. Caldwell (Me '40) of Richmond, Va., died in January 2005. He was a retired executive of Ethyl Corp.

Thomas W. Markwood (Me '47) of Chester, Va., died in November 2004. He retired as a mechanical engineer with the Virginia Department of General Services. As a student, he lettered on the boxing team and was a member of the Theta Tau engineering fraternity.

HAVE YOU HEARD ABOUT US ON THE RADIO RECENTLY?
In February, SEAS began running a series of radio spots on NPR stations in Charlottesville, Harrisonburg, Lexington, Winchester and Farmville highlighting the exciting innovations taking place at SEAS.

Here are just a few examples:

“This message is brought to you by the ...

- University of Virginia School of Engineering and Applied Science—where glassy metals are stronger than steel. At U.Va., engineers have created a new material by quenching a metal alloy. This novel metal is 300% stronger than steel.

- University of Virginia School of Engineering and Applied Science—where NASA looks for answers. At U.Va., researchers serve NASA with inventions like “Galileo,” a software tool that applies complex mathematics to evaluate the reliability of intricate systems.

- University of Virginia School of Engineering and Applied Science—making the roads safer. At U.Va., engineers working in a Smart Travel Lab collect real-time traffic data and model alternative patterns to enhance transportation planning.

- University of Virginia School of Engineering and Applied Science—helping law enforcement officials. At U.Va., researchers invented GRASP—a Web-based repository that translates electronic information from multiple jurisdictions into a common format allowing sharing of specific data.

- University of Virginia School of Engineering and Applied Science—where green engineers are at work. At U.Va., researchers practice green engineering, which represents a shift from industrial systems designs toward a sustainable design perspective.

U.Va.—Engineering for the Common Good.
How has Technology Changed History?

U.Va. Professor W. Bernard Carlson Counts the Ways

Professor W. Bernard Carlson (STS) believes that students don’t learn enough about the vital interaction of technology, culture and history. So he decided to do something about it. The result is the seven-volume *Technology in World History*, published by Oxford University Press, for which Carlson served as editor-in-chief.

**Technology = Out-of-the-Box Thinking in Any Culture**

**Q.** Why did the Aborigines invent the boomerang?
**A.** So they wouldn’t have to chase after their “hunting stick” when they went hunting.

**Q.** How did Henry Ford reduce the time needed to build a car from 12 hours and 8 minutes in 1908 to 1 hour and 30 minutes in 1914?
**A.** By creating the moving assembly line.

**Q.** What agricultural method did the ancient Maya use that their descendants continue to use today?
**A.** Slash-and-burn agriculture, or “swidden,” which involves rotating fields in and out of production. They let the fields lie fallow for eight to 10 years and replant them after burning the vegetation that has been growing in the meantime. Ash from the burned vegetation returns nutrients to the soil and helps tropical soils, typically low in nutrients, recover their fertility.

**Q.** What modern piece of office equipment helped foil a coup attempt in the Soviet Union in 1991?
**A.** The fax machine. People found out about the coup attempt through faxed information, and activists filled the streets of Moscow until the takeover attempt collapsed.

**Q.** When did people first use biotechnology in the food industry?
**A.** Egyptian brewers, 2,000 years ago, used the yeast microorganism to ferment barley to produce beer.


Read more about this at: www.virginia.edu/topnews/releases2006/20060321CarlsonBook.html.

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**Come Home to SEAS June 2–4**

Join SEAS faculty and alumni at a casual picnic-style lunch at Darden Court, learn all about “Engineering New Tissues: A New Frontier in Medicine” and find out if “Robots Are Watching”—all at SEAS Reunions Weekend 2006! This June 2–4, come home to U.Va., and enjoy a variety of fun and scholarly events hosted by the School of Engineering and Applied Science.

**Friday, June 2**  University Professor Cato Laurencin, “Engineering New Tissues: A New Frontier in Medicine,” 3:30 p.m.

**Saturday, June 3**  Professor Barry Horowitz, “Robots are Watching,” 11 a.m.

**Saturday, June 3**  Family fun picnic, 12 noon, Darden Court

www.seas.virginia.edu/enews/enews_apr06/reunion06.html
Professor Emeritus Henry L. Kinnier (CE ’42) published the first engineering alumni directory and was one of the earliest members of the Virginia Engineering Foundation over 50 years ago. He is a Lifetime Member of the SEAS Trustees and a lifelong supporter of the Engineering School. A charming gentleman who never fails to exhibit the best of what it means to be a “Virginia Engineer,” Henry reflects here on the SEAS of yesterday, today and tomorrow.

**Under Dean Aylor’s leadership, SEAS is building on yesterday’s traditions to create tomorrow’s vision. What are the very most important traditions we must keep in mind?**

Well, the Honor System was important then, and it is important now. When I first came to study here, undergraduate education was all that we had, and the classes were small. Students respected their teachers, and everyone knew each other. SEAS has grown, but I think that we still care about teaching undergraduates, we still offer small classes and we are still a place where folks care about each other.

**What made your relationships with your colleagues special during your years here?**

We all knew each other very well. We helped each other move, had dinners together and watched each other’s children grow up. Most of us taught four or five classes each semester, and we would exchange courses now and then, but there wasn’t much collaboration. Still, because we knew each other, we knew a great deal about what we were each teaching.

**What adjectives would you use to describe the students of those years?**

Overall, students were enthusiastic and respectful. They wanted to be here, and they often stayed after graduation and became part of the teaching faculty. In 1970, we had women as students for the first time, and that was a good thing. The women made a good place get even better.

**What is the single biggest challenge facing us as we teach the engineers of tomorrow?**

The challenge is giving students the broad education that they need because engineering no longer exists in separate disciplines. I think SEAS already does that well.

**Over the years you have supported the Engineering School generously with your time and treasure. Why do you think alumni should support the School?**

We must provide support because the state isn’t able to fully support the School’s budget. I have never been a rich man, but I have always done what I could to support the Engineering School because I am thankful for what the School has meant to me. I think Dean Aylor is doing a great job. The faculty is first rate, and the students are brighter than ever. I enjoy watching all the good things going on, and I am glad to be able to help.
Join in a Conversation with the Dean

In February, Dean Aylor asked:
“What is your advice for new graduates entering the profession?”

“Never stop developing your talents and learning new things. Be flexible: The world is changing at a fast rate, and you don’t want to be left behind.”

—Christine C. Mills (Applied Math ’75)

“You have only begun to learn. Learn your profession; learn about other people; learn about yourself. Integrate these three in a way that allows you to love what you are doing, and you will be rich in far more than mere dollars.”

—Matthew P. McCormick (SIE ’88)
Innovation. Progress. Promise.

The cornerstones that defined a U.Va. engineering education 50 years ago are the same principles that define the U.Va. engineering experience today.

- **Quest for responsible solutions**
- **Honor in all pursuits**
- **Initiatives in applied research and discovery**

Now, more than ever, it is important to educate ethical and responsible engineering leaders. A gift from you today will help us do just that.

Make your gift at: www.virginia.edu/supportuva/give.php3 or call Kyle Maner, 434.924.7639, for further information.