Hokies make history at Daytona

The second-generation Blind Driver Challenge car takes the track of the famous Daytona International Speedway.

A team of College of Engineering graduate and undergraduate students made history on Jan. 29, 2011, at Daytona International Speedway.

As part of the ongoing Blind Driver Challenge, a blind man drove a 2010 Ford Escape Hybrid SUV on 1.5 miles of the famed course during the three-day Rolex 24 race extravaganza. At a top speed of 27 mph, Mark Riccobono, an executive with the National Federation of the Blind, manned the vehicle through a set of obstacles that included barriers, randomly thrown cardboard boxes, and passing a moving vehicle. High-tech hardware developed by Hokies, past and present, assisted the driver.

The 10-minute trip caps years of research engineering work by students led by Dennis Hong, director of Virginia Tech's Robotics and Mechanisms Laboratory and associate professor of mechanical engineering.

"As Mark arrived safely at the finish line, hugging his wife with tears in his eyes, I couldn't help but also cry," Hong said.

In 2004, the National Federation of the Blind, a nonprofit advocacy group based in Baltimore, put forth the Blind Driver Challenge to create technology that one day could allow a blind person to safely and reliably drive an automobile.

Virginia Tech remains the only research institution to take up the call. Work began in earnest in 2008. Within three years, undergraduate engineering students built a prototype buggy that used laser range finders to scan the surrounding environment and relay information back to the driver via a variety of new non-visual interface technologies. The buggy publicly debuted at the NFB's Youth Slam summer camp in College Park, Md., in July 2009.

From there, work began on the second-generation vehicles, cars that could conceivably be used on the open road. The short goal was strong: debut the cars at one of the most famous landmarks in the world of automobiles.

Virginia Tech enlisted the help of TORC Technologies, a company founded by College of Engineering alumni and based at the university's Corporate Research Center. TORC had an essential ingredient: BiWire XDV technology that can be integrated with a vehicle, in this case two Ford Escape Hybrids. The technology provides reliable and safe electronic control of the vehicle and gives it the capability to be stopped remotely, among other modifications.

Engineering students designed the non-visual interface devices blind drivers use to operate the vehicle. The hardware includes gloves called DriveGrips and a seat cushion called SpeedStrip. Both visualize certain cues that indicate directions to accelerate or halt, turn right or left. The vehicles can "see" obstacles and the road ahead through strategically placed laser range finders and cameras.

At the debut, a track announcer called out every move by Riccobono. Hundreds of Federationists cheered as Riccobono passed by the track's grand stands. "People asked me what are you going to say, and I had some things in mind of what I was going to say," Riccobono said afterward. "But for me the moment spoke for itself, there were no words, even words that I conjure up ahead of time that would fit the moment."

Paul D'Angio, a mechanical engineering doctoral student from Basking Ridge, N.J., was at Daytona. "We made a large amount of practice runs, so during the actual track run we were focused on performing our individual tasks," he said. "Once the vehicle came to a stop however, screams of celebration echoed throughout the lead vehicle after eight months of work we had finally done it!"

"It was a truly overwhelming experience while it was going on, but now I realize this is just the beginning," added Ryan Colby, a mechanical engineering master's student from Rochester, N.Y. "The demo has really made me open my mind as to the amount of research that needs to be done concerning non-visual human perception."

Lee named to NAE

Fred Lee, a Virginia Tech University Distinguished Professor and a member of the Bradley Department of Electrical and Computer Engineering, was elected in February 2011 to the National Academy of Engineering. He was one of 68 new members elected to the world-renowned group.

For 30 years, Lee has helped forge a paradigm shift in the manufacturing of power electronics products, including computers and telecommunications, motor drives for heating, ventilating, and air conditioning, and other industrial and commercial applications. "Almost everything a consumer touches has power electronics in it. It is really an enabling technology that is not visible," he said.

He started at Virginia Tech in 1977. In 1983, he founded the Virginia Power Electronics Center, a research group that helped change the way electricity is used. In 1987, the center was designated as a Technology Development Center of the Virginia Center for Innovation in Technology. Under Lee's leadership this center became the largest university-based power electronics research group in the United States. More than 90 industries became associated with the world-renowned center.

In 1998, Lee was successful in competing for a National Science Foundation Engineering Research Center called the Center for Power Electronics Systems, with total Foundation funding that exceeded $30 million. He directed the Center, comprised of five universities and more than 100 corporations, for a decade, the maximum number allowed by the scientific agency.

His vision was to make the United States the world's most efficient user of electrical energy, and to guide the center's work to produce a 30 percent savings in electric power consumption. Lee accomplished this goal.

He has pioneered lecture and laboratory courses to support power electronics, and has supervised 80 master's level and 69 Ph.D. students since 1977. Total funding secured by Lee exceeds $87 million.
Our Signature Engineering Building moves forward, as does the college

Many Americans families and businesses continued to tighten their belts and get by during the past year. The College of Engineering at Virginia Tech did likewise, with our amazing faculty, staff and students working harder and smarter. Despite the poor state economic climate, we do have some great news to report.

During the past several years, the college has had its own ambitious goal within the overall university’s capital campaign. We hoped to raise $150 million during the Campaign for Virginia Tech that will close in the fall of this year. I am pleased to report, the College of Engineering has surpassed this goal, and we are still climbing as of this writing. So, even before the campaign officially ends, I must thank all of our supporters for their generosity and vital assistance.

Much of the money we are raising will be designated for capital projects for the college, including our planned new Signature Engineering Building. You all know that for a long time we have not been able to rely solely on the commonwealth to maintain the university’s infrastructure. We have also been fortunate that many of our generous families and friends have been with us every step of the way over the years. Convincing the Commonwealth to invest in our building projects has been a challenge. Yet, despite the political climate, I believe we will be able to secure the funding to build the new Signature Engineering Building.

Our signature building will address severely deteriorated undergraduate academic space for our engineering students. It will be a combination of classrooms, instructional laboratories, research laboratories, and offices to house a number of departments and programs in the college. It will contain highly specialized laboratories that will support hands-on problem solving and active learning in the engineering disciplines. This 100,000-square-foot footprint is based on the college’s strategic plan, comparisons to peer institutions, and innovative and efficient designs for the new space.

As we work with the legislative side on this project, we have the leadership of several members of our College Advisory Board. Through their efforts, we obtained a pre-planning money in 2008 from Virginia’s Central Capital Planning Fund to work on the Signature Engineering Building. Simultaneously, the university committed to a full architectural and engineering plan. This was no small expense. It showed our resolve to erect this building at the earliest possible date. In 2009, the Virginia General Assembly authorized the expenditure of $2 million for detailed planning of the building. We engaged McKee & Company to help with planning. McKee & Company’s founder and Virginia Tech alumnae Art McKinney has been instrumental in the progress of the building. Art is a former chairman of our College Advisory Board and a graduate of the college. Art is also a recent inductee into our Academy of Engineering Excellence.

Our Legislative Committee, led by John Sparks, a mechanical engineering graduate employed by Aerogel in northern Virginia, again returned to the 2011 General Assembly on Hokie Day 2011 to reiterate the need for our building. The message was:

- We provide one-half of all the engineers educated annually in the commonwealth.
- We are one of the highest ranked colleges of engineering in the nation.
- Our graduates are likely to remain in Virginia.
- The commonwealth needs a large supply of bright, creative, high-impact engineers to meet industry’s needs.

The Commonwealth also needs a large number of engineering graduates employed by Virginia Tech all over the world. They are some of the brightest students we train. It is our hope that we can ensure that our engineering graduates can find good jobs with our many employers in the Commonwealth of Virginia.

With the close of the 2011 General Assembly session, the Signature Engineering Building was listed for construction funds for the second year of the biennial budget. All is not yet clear. As of this writing, the one concern we still have is the General Assembly’s pending review of the nation’s debt capacity before final authorization. But we do believe the construction of this building is a matter of “when,” not “if,” and that is in large part due, again, to our wonderful alumni and supporters.

Our students are also aware of the importance of the new building. They have already made the first contribution to the building project. A little over $1,000,000 has already been raised.

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The Virginia Tech College of Engineering’s slate of high marks continued in 2010. We were again ranked among the nation’s top engineering schools, according to reports in both U.S. News & World Report and the Wall Street Journal.

With the close of the 2010 academic year, the Virginia Tech College of Engineering was once again ranked among the nation’s top engineering schools. The college ranked No. 13 among the nation’s top engineering schools. In specialty programs, our mechanical engineering program ranked 13th for employment in science and engineering. Virginia Tech was one of the highest ranked colleges of engineering in the nation.

We are one of the highest ranked colleges of engineering in the nation. Our alumni and corporate friends are the keys to our continued success. As of mid-February, we have raised some $31 million from private giving for our Signature Engineering Building. We have a website dedicated to the building. Visit vsutty.evtu.edu/signaturebuilding for more information.

Richard C. Benson
Dean of the College of Engineering
College inducts alumni into Academy of Engineering, hails young educator

The College of Engineering this past year honored Harold Martin Sr. as its Distinguished Alumnus for 2010 and awarded Edward Tiedemann Jr. its 2010 Distinguished Service Award. Martin’s honor came shortly after he was named 12th Chancellor of North Carolina Agricultural and Technical State University, or North Carolina A&T. He graduated from North Carolina A&T, earning undergraduate and master’s degrees in electrical engineering from the former, and a doctorate in the same discipline from Virginia Tech. His academic career has focused on his undergraduate alma mater. He served as dean of the school’s College of Engineering, before he was tapped to head positions at N.C. State University, Winston-Salem State University, and then the state-wide University of North Carolina system. Martin was named head of North Carolina A&T in June 2009. As Chancellor at Winston-Salem State, Martin saw student enrollment nearly double—from 2,796 to 5,556, freshman SAT scores climb by nearly 70 points, and oversaw a dramatic construction project on campus.

Virginia Tech’s College of Engineering in spring 2010 inducted seven new members into its Academy of Engineering Excellence, an elite group of professionals from the school’s more than 55,000 living alumni. This year marked the 11th anniversary of the first induction. The 2010 inductees were:

- Richard Arnold earned a bachelor’s in industrial engineering, and later worked nearly 30 years at Union Carbide Corp., and then 12 years at AlliedSignal. He also oversaw large projects and pools of employees.
- Pat Artsis earned a bachelor’s in engineering science and mechanics, and later co-founded Performance Associates Inc. with his wife, Nancy. The company focuses on the characterization and performance of storage subsystems of computers. Its clients include Fortune 500 companies.
- Dennis Kamber earned a bachelor’s in civil engineering, and later started Kamber Engineering Inc., working in waste-water treatment. He designed the first sequenced-batch activated sludge plant which won a national engineering award in 1986.
- Mary Miller earned a bachelor’s in computer science, and started Interactive Design and Development, an IT developer and producer of educational materials. Her clients include Federal Express, Citibank and Dow Chemical.
- E. Minor Pace earned a bachelor’s in mining engineering and worked for Inland Steel Coal Co., holding titles such as executive vice president and vice chairman of the Kentucky Coal Institute, chair of the Illinois Coal Institute. He remained a leader in mining industry advocacy groups until his January 2011 death.
- Henry Sodos, a three-time Hokie graduate, having earned bachelor’s, master’s and doctoral degrees, all in mechanical engineering, was named 2010 Outstanding Young Alumnus. He is now an assistant professor of mechanical and aerospace engineering at Arizona State University.
- Manuel A. Perez-Quinones, an assistant professor at Virginia Tech’s College of Engineering, was named 2010 Brilliant 10.
- Nicholas DesChamps earned master’s and doctoral degrees in mechanical engineering. He continues a 60-plus-year career with NASA, having worked on a wide variety of craft such as the F-102 to the B-58, and the Apollo, Mercury and Gemini missions. He also worked in education.

From left to right, are: Virginia Tech College of Engineering Dean Richard C. Benson, Richard Arnold, H. Pat Artsis, Dennis M. Kamber, Nicholas DesChamps, Jack Boyd, Henry Sodos, Mary Miller, and Minor Pace.

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College honors alumni Martin and Tiedemann

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In March 2010, CHARLI took its first steps as anxious onlookers stood ready to catch him if he fell. His stride was short, but upright, as one foot was placed in front of the other in the basement of Randolph Hall. Those physical steps pale in comparison to the great strides that CHARLI made in the media. Within a few weeks, CHARLI was featured on the web sites of Wired and Engadget, and the cover of Popular Science. He also is slated to appear in National Geographic.

That’s not bad for a roughly five-foot tall humanoid robot that is now just a year old. CHARLI (that’s for Cognitive Humanoid Autonomous Robot with Learning Intelligence) is the first unorthodox, autonomous, full-sized, walking, humanoid robot with four moving limbs and a head, built in the United States. His long legs and arms can move and gesture thanks to a series of pulleys, springs, carbon fiber rods and actuators.

CHARLI was built by a team of graduate and undergraduate students under the direction of Dennis Hong, associate professor of mechanical engineering and director of the Robotics and Mechanisms Laboratory (RoMeLa).

“It is amazing how a small group of our RoMeLa students were able to pull off this remarkably challenging task, especially with a shoe string budget and in such a short period of time,” Hong said recently. “This actually forced us to innovate and develop novel approaches to tackle the challenging engineering problems such as coming up with mechanical solutions to simplify the design.”

Of course it will be years before CHARLI or his incarnations (CHARLI 2 and a similar robot that will be used to fight fires on naval ships in the works now) will be seen walking around the Virginia Tech campus or even in homes across America.

CHARLI’s main designer, doctoral student Jeakweon (“J.K.”) Han, said he visualized CHARLI as helpful to society. “When I was a young child in Korea, I was always watching Astro Boy on TV, a show about this heroic robot helping and protecting people,” he said. “I want people to accept robots as their companions, not as a ‘Terminator.’”

The year 2010 wasn’t always kind to CHARLI. He popped a balance sensor in one foot, the robot crashed to the ground after a few steps while CHARLI was walking again, but his walking has since been sporadic.

A cool fact: CHARLI was born with only a fraction of the costs other developers sink into humanoid robots in Japan and Korea, two countries leading the robotics field. Hong’s students later were able to get CHARLI walking again, but its walking has since been sporadic.

Projects drive, float, and fly on their own power

Faculty and students work to build unmanned vehicles for land, sea and air

The vehicles speed across water, can cut through air or handle rough land terrains with ease. All under their own power, unmanned. Each received media attention this past year and was originated fully or in-part by faculty and students from multiple College of Engineering departments.

Land

This past year, the U.S. Marine Corps Warfighting Laboratory worked closely with Virginia Tech and Blacksburg-based TORC Technologies to build four Ground Unmanned Support Surrogates (GUSS) that will be used for their ability to support a platoon of U.S. Marines. The unmanned vehicles are designed to carry up to 1,800 pounds and can move at the speed of five miles per hour. They stem from earlier work with TORC’s DARPA-sponsored unmanned vehicle competitions.

“The focus of the collaborations is to leverage the research capabilities of the university with the commercialization capabilities of a small business,” said Al Wicks, professor of mechanical engineering and faculty advisor to the team.

In June 2010, the four unmanned autonomous vehicles headed to Hawaii to participate in the July 2010 Rim of the Pacific (RIMPAC) war games. Fourteen nations, 34 ships, five submarines, over 100 aircraft and 20,000 personnel participated in the biannual exercise.

Student team members included: Patrick Currier, Phillip Tweedy, James May, Jason Doyle and Everett Braden.

Air

Students at the unmanned Systems Laboratory are continuing work on an autonomous helicopter they hope will never be used for its intended purpose. Roughly six feet long and weighing 200 pounds, the re-engineered aircraft is designed to fly into American cities blasted by a nuclear weapon or dirty bomb. “It’s for a worst-case scenario,” said project leader Christian Kochersberger, director of the Virginia Tech lab.

Kochersberger and his team re-engineered a remote-controlled Yamaha-built unmanned Aerial Vehicle RMAX helicopter to fly in fully autonomous mode. They also created flight control software algorithms that will direct the helicopter to radioactive sources on its own accord. To carry out various missions, the researchers outfitted the helicopter with several “plug-and-play payloads” as the vehicle’s weight capacity is limited. The payloads carrying devices that would detect radiation levels in the atmosphere and on the ground, and take video and still images of damage.

Sea

A team of faculty and student researchers are working on an autonomous boat that could one day quickly explore waterways that are difficult to reach or navigate by a conventional craft.

“It can operate in riverine systems where maps are poor and hazards are common,” said College of Engineering graduate student Christian Sonnenburg, who is studying atmospheric and ocean engineering.

The 16-foot unmanned surface vehicle (USV) is equipped with sonar, lasers, and 3-D imaging cameras designed to identify hazards above and below the water, be they natural, such as hurricane damage, not man made. The USV is being developed by Virginia Tech associate professors Dan Stillwell and Craig Woolsey, and researchers at the U.S. Naval Postgraduate School.

Virginia Tech is handling technology originated fully or in-part by Virginia Tech students, faculty and researchers. Projects drive, float, and fly on their own power...
A design on giving

Student Engineers’ Council Raises $500,000 to support student team, job expo

This past year, the self-funded, nonprofit Student Engineers’ Council celebrated a huge accomplishment: capturing a $500,000 endowment to support student design team projects, providing funds for everything from a Human-Powered Submarine to a Formula SAE race car to the original Blind Driver Challenge vehicle.

The $500,000 design endowment began in 2007 and was funded in-part by donations from major companies such as Boeing, as well as the council’s hosting of an annual job expo on campus. It is just one part of the programs and initiatives funded annually by the council. During its 40-year existence, the council has given more than $5 million to student team projects, scholarships, and philanthropic organizations at Virginia Tech.

“Every year, we listen to the students of the projects we support present on their progress as they apply for funding, and it’s a joy,” said Caitlin Proctor, a University Honors student from Stafford Va., who is majoring in civil engineering and heads the council’s awards and scholarship committee. “Some of my personal favorites are the outreach and charity groups we support.” Without the council, CHARLI – the now famous walking humanoid made by students at the Robotics and Mechanisms Laboratory (RoMeLa) – might never have taken a step. The council in 2008 gave RoMeLa $20,000 in seed money.

In career impact, the council’s Engineering Expo brings more than 220 companies – even during a bad economy – to campus to meet with students seeking internships or post-graduation jobs. The yearly event attracts north of 3,000 students.

“Both companies I have worked for while at school were companies that I first made contact with through Expo,” said John Sherwood, a senior majoring in computer science from Yorktown, Va., who is director of finance for the council. “The first (company) I worked for is the company I will be working with full-time following graduation.”

Every fall, the Student Engineers’ Council hosts the Engineering Expo job fair at Squires Student Center.

STUDENT HIGHLIGHTS

Aerospace students win AIAA contest

A Virginia Tech team’s design of a reliable and cost-effective system to send a minimum of two astronauts to a Near Earth Asteroid and return them safely to Earth won First Place at the 2010 American Institute of Aeronautics and Astronautics Team Space Transportation Design Competition. Team members were Eric Buckenmeyer, Joshua Egg- leston, Andrew Lyford, Katie Rybacki, Umar Surani and Kristopher Walbert. Kevin Shinaughty, director of research and cluster computing, served as faculty adviser.

Student works on project to improve medical chart

Carlos Guevara, a master’s student in mechanical engineering from El Salvador, spearheaded work on transforming a well-known paper-based medical chart used by pediatric emergency personnel into a digitized format that can be displayed on a large LCD TV monitor within emergency rooms. The collaborative effort on the Broselove Pediatric Emergency Tape was between the College of Engineering, Roanoke-based Carilion Clinic Children’s Hospital and James Broselove, the physician who created the original method.

Doctoral student seeks to end spoilers

Have you ever read about a movie’s ending before you saw it, thus the whole point of watching the film becomes moot? That’s called a spoiler. Sheng Guo dis-likes them. So, the computer science doctoral student from Yangzhong, China, decided that such revelations must end. With adviser Naren Ramakrishnan, Guo developed a data mining algorithm that uses linguistic cues to spot and flag spoilers before an unsuspecting reader stumbles on them. Guo presented his findings at the 23rd International Conference on Computational Linguistics.

Graduate school Man of the Year

Mehdi Nikkhah of mechanical engineering was named Graduate Man of the Year at the Graduate School’s Annual Awards Banquet in March 2010. A native of Iran, Nikkhah has published more than 20 journal articles and peer-reviewed conference papers, and holds two U.S. patents.

Bilgen takes third place in Boeing competition

Onur Bilgen of Ankara, Turkey, a recent Ph.D. recipient in mechanical engineering, won third place in the Boeing competition for Engineering Student of the Year 2010. He was recognized for his work to enhance the use of small, unmanned air vehicles and micro air vehicles that can have a myriad of uses. Additionally, Bilgen filed for two patents, one concerning a shape-changing airfoil, also referred to as a morphing airfoil.

Student paper on worms is published

Sean Gart, of Salem, Va., a senior in engineering science and mechanics, and Sungwhan “Sunny” Jung, assistant professor of engineering science and mechanics, collaborated on a paper dealing with microscopic worms and bioconvection. The creatures known as nematodes exhibit the so-called “Cherenkov effect” when they move in a collective motion. The research could provide a better understanding of capillary effects in colloidal particles in engineering. Their work was published in the journal Soft Matter.

Team wins with design of NADA flying vehicle

A team of undergraduate aerospace engineering students took the top prize in a NASA aeronautics competition to develop a multi-purpose amphibious aircraft. The team was tasked with designing a civilian aircraft that could rescue as many as 50 survivors in the event of a natural disaster. Team members included: Ryan Berg, Alexander Carrara, Joseph Diner, Jason Smith, James Tenney, Bryant Tomlin, Alan Steinert, Ryan Paetzer and Naren Ramakrishnan. Craig Creaven, William Mason of aerospace and ocean engineering was faculty ad- viser.

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Researchers respond to Gulf Coast oil spill

The Gulf Coast oil spill had everyone and ruled headlines for much of 2010. The disaster jump-started two new research projects within the College of Engineering aimed at helping if such an incident ever recurs. Jules White seeks to create a future army of Citizen Scientist responders during such crises. Meanwhile, Mark Widdowson and Amy Pruden are studying how the shape of oil masses affect their breakdown.

The National Science Foundation awarded a $65,000 grant to White, an assistant professor in the Bradley Department of Electrical and Computer Engineering. He wants to put the task of data collection during a catastrophe such as the oil spill into the hands of ordinary citizens. A massive data collection during a catastrophe such as the oil spill and Computer Engineering. He wants to put the task of data collection during a catastrophe such as the oil spill into the hands of ordinary citizens. A massive data collection during a catastrophe such as the oil spill and Computer Engineering. He wants to put the task of data collection during a catastrophe such as the oil spill into the hands of ordinary citizens. A massive data collection during a catastrophe such as the oil spill into the hands of ordinary citizens.

“Everyday people can record ecological impacts that they see and send along that data for scientist to use,” White added.

White has a direct connection to the spill that bled more than 200 million gallons of oil into the Gulf after the April 20 blowout at BP’s Deepwater Horizon. He is a native of Fairhope, Ala., a town along the Gulf Coast. “Being from Mobile absolutely made me want to take a special interest in this,” White said.

Within the Charles E. Via Jr. Department of Civil and Environmental Engineering, Widdowson and Pruden-Bagchi are using a separate $60,000 one-year National Science Foundation grant to study how naturally occurring microbicides can best be used to eat away remaining crude oil spilled in the Gulf of Mexico. Their choice of weapon: geometry.

Fueled by oxygen, naturally occurring bacteria can slowly destroy blobs and slicks of crude oil without the use of additional chemicals. In Widdowson, professor and assistant department head, and Pruden, associate professor of civil and environmental engineering, hope to determine if the shape of crude oil remnant – be it a flat syrupy sheet or a tar ball – can affect those deterioration rates. They also will study how a lack of oxygen can hinder microbe growth, and how carbon leaching from dissipating oil can further fuel these oil-eating microbes, a two-step process known as mass transfer and biodegradation. Removing toxic chemicals left by the spill also will be studied.

“This research has the potential for improving our understanding of the long-term persistence of chemicals in the environment. In terms of clean up, there are many problems left to solve regarding the most toxic and recalcitrant pollutants that dissolve out of liquid sources, not just associated with oil spills, but at industrial sites, etc...” says Widdowson.

As with White, both Pruden and Widdowson are familiar with the Gulf Coast. Pruden’s spouse has relatives living in Mobile, while Widdowson previously lived in Alabama. “My wife and I both attended Auburn University and occasionally managed to slip away to the Gulf beaches,” he said.

The grants were awarded under the National Science Foundation’s RAPID Response Research program, which funds scientific projects with strong issues of timeliness.

Hypothermia as a chemotherapy alternative?

Virginia Tech engineering researchers and a colleague from India unveiled a potential new method to target and destroy cancerous cells: Hyperthermia. The process was introduced at the 63rd annual meeting of the American Physical Society.

The cancer treatment uses hyperthermia to elevate the temperature of tumor cells, while keeping the surrounding healthy tissue at a lower degree of body heat. The investigators used both in vitro and in vivo experiments to confirm their findings.

The research team includes Monnudee Liangruksa, a graduate student in engineering science and mechanics, and her thesis advisor, Shwet Puri, professor and head of the department, along with Ranjan Ganguly of the department of power engineering at Jadavpur University, Kolkata, India.

Liangruksa of Bangkok, Thailand, presented the paper at the meeting. The researchers used ferrofluids – a liquid that becomes strongly magnetized in the non-polar state.

These fluids can then be magnetically targeted to cancerous tissues after intravenous application,” Puri added. “The magnetic nanoparticles are suspended in the non-polar state.

“These fluids can then be magnetically targeted to cancerous tissues after intravenous application,” Puri added. “The magnetic nanoparticles are suspended in the non-polar state.

The magnetic nanoparticles are heated by exposing the tumor to a high-frequency alternating magnetic field, causing the tissue’s death by heating. This process is called magnetic fluid hyperthermia, which the research team has renamed “thermotherapy.”

Temperatures ranging from 41 to 45 degrees Celsius can slow or halt cancerous tissue growths. Yet, without the process of magnetic fluid hyperthermia, these temperatures also destroy healthy cells. The team plans to test this approach by conducting experiments on various cancer cells in collaboration with the Virginia-Maryland School of Veterinary Medicine.

A senior design team consisting of five engineering science and mechanics undergraduate students is fabricating an apparatus for these tests.

Researchers respond to Gulf Coast oil spill
Faculty members snag NSF CAREER research grants

Three College of Engineering assistant professors received the National Science Foundation’s Faculty Early Career Development Program (CAREER) award during the past year. The grants are the NSF’s most prestigious award for creative junior faculty considered as future leaders in their respective academic fields.

Hassan Aref, professor of Engineering Science and Mechanics, received the G. T. and Elizabeth P. Taylor Medal from the Society of Engineering Science. The award, recognizing Aref’s research contributions in fluid mechanics, will be presented in fall 2011.

Engineering Science and Mechanics assistant professor Romesh Batra received the 2011 Virginia Outstanding Student Award. Batra, who holds Virginia Tech’s Clifton C. Garvin Professorship, is renowned for his work on materials strength.

Doug Bowman and Wu Feng, associate professors of computer science, were recognized as 2010 Distinguished Members by the Association for Computing Machinery. Feng, also on faculty with the electrical and computer engineering department, will head a $2 million National Science Foundation grant to help create HokiSpeed, a versatile new supercomputer, in an inter-college Virginia Tech project.

Gary Downey, alumni Distinguished Professor of Science and Technology in Sociology at Virginia Tech, was honored with the Virginia Outstanding Faculty Award, the Commonwealth’s highest honor for faculty.

Marc Edwards, the Charles Lunsford Professor of Civil Engineering, is spearheading a $450,000 empirical and computational evaluation of the federal Lead and Copper Rule, an EPA regulation designed to protect water customers from elevated levels of lead and copper. Related, the Washington Post has cited Edwards’ work in uncovering city-wide problems related to water contamination.

Dennis Hong, associate professor of mechanical engineering, was selected to speak at the March 2011 IEEE UHConference. His fellow speakers included Bill Gates, Bill Ford and Roger Ebert, all giving the “18-minute talk of a lifetime.”

A team of mechanical engineering faculty, led by Marc Huxtable, received a three-year, $1.5 million federal grant to investigate vehicle emissions reduction and increased fuel economy. The team included fellow mechanical engineering faculty Smarz, Ekkad and Thashank Priya, associate professors; and Dan Inman, the George Goodson Professor of Mechanical Engineering.

Dan Inman, the George Goodson Chaired professor of Mechanical Engineering, was invited to testify before the U.S. House of Representatives in fall 2010. He was part of a panel discussion on “Cutting Edge Energy Technologies: Energy from Movement, Magna and Much More.”

Sungwhan (Sunny) Jung, assistant professor of engineering science and mechanics, and his doctoral graduate student Navish Wadhwa shared a Milton Van Dyke Award for research involving fluid mechanics of silicone oil.

Brian Klein was named director of Virginia Tech’s Myers-Lawson School of Construction. He also was recently honored with the Ralph H. Bogle Fellow in the Grado Department of Industrial and Systems Engineering.

William Knocks joined Virginia Tech’s Office of the Vice President of Research as associate vice president for research programs. He is the W.C. English Professor of Civil and Environmental Engineering.

Chang Lu and his chemical engineering research group discovered a new delivery method of DNA payloads into cells. The new work involves “hydrodynamic effects that uniquely occur when fluids flow along curved paths.” The work was featured on the cover of trade pub Lab on a Chip, and in Nature magazine.

Thurmon Lockhart, associate professor of industrial and systems engineering, will serve a five-year term on the Center for Scientific Review’s Musculoskeletal Rehabilitation Sciences Study Section at the National Institutes of Health.

Mechanical engineering faculty members Robert Mahan, Reginaid Mitchell, James Thomas and William Thomas were conferred the title of professor emeritus by the Virginia Tech Board of Visitors. Linsey Marz, associate professor of civil and environmental engineering, led a study on the risk of airborne infection in public places from concentrations of the influenza A virus. Results were published in the Journal of the Royal Society Interface.

Rolf Mueller, associate professor of mechanical engineering, received the Friendship Award of the People’s Republic of China, considered the nation’s highest honor for “foreign experts who have made outstanding contributions to the country’s economic and social progress.”

Raghu Pasupathy, professor of industrial and systems engineering, received the 2010 IBM Faculty Award in recognition of his ongoing work on the methodology of simulation optimization and random vector generation. The award included a $10,000 cash prize.

Amy Pruden, assistant professor of civil and environmental engineering, published a paper on antibiotics in the Environmental Science & Technology trade journal. The paper shows that up to 90 percent of antibiotics can pass through a body without metabolizing after consumption.

Departm ent of Computer Science head Barbara Ryder was named vice president of the Association for Computing Machinery, a group of more than 97,000 computing professionals and students who comprise its international membership.

Gary Seidel, assistant professor of aerospace engineering sciences, received a Ralph E. Powel Junior Faculty Enhancement Award to develop a carbon nanotube-enhanced composite for structural health monitoring sensors to improve the resiliency of huge wind turbine blades.

Sunil Sinha, associate professor of civil and environmental engineering, is directing new research projects to develop a national database on two million miles of the nation’s aged infrastructure of water and wastewater pipes. He also will organize repair and replacement remedies.

Mark Strebler, associate professor of engineering science and mechanics, will spearhead a $3 million, five-year grant from the National Science Foundation to prepare future Ph.D. researchers for work in biological sciences.

G. Don Taylor, head of Virginia Tech’s Grado Department of Industrial and Systems Engineering, has been selected as a Fellow of the World Academy of Productivity Science.

Janis Terpeny, professor of engineering education and mechanical engineering, has been appointed as a program director for the National Science Foundation.

Paul Torgerson was awarded the 2010 Industrial and Systems Engineering Distinguished Alumni Award in Academia by his alma mater, Lehigh University. In Bethlehem, Penn. Torgerson was dean of the College of Engineering from 1970 to 1990, and university president from 1993 to 2004.

The Center for the Enhancement of Engineering Diversity – known as CEED and directed by Beverly Watford – won the Accreditation Board of Engineering and Technology’s 2010 national Claire L. Felser Award for Diversity.
Charlie Yates, Virginia Tech’s first African American graduate, dies at 74

Charlie L. Yates, the first African American graduate of Virginia Tech and later a member of the College of Engineering faculty, died August 11, 2010, after a long battle with Leukemia. He was 74.

Yates made history in June 1958 as the first African American to graduate from then Virginia Polytechnic Institute, still part of a South that largely practiced segregation in nearly every private and public life parameter.

His bachelor’s degree in mechanical engineering came with honors. He was hailed as the first African American “to be graduated from any major Southern engineering institute” by newspapers.

With a doctoral degree from Johns Hopkins University, Yates returned in 1978 to Virginia Tech as a professor. He remained a Hokie until 2000, except for the years 1983 to 1987, when he taught at Hampton University and then Old Dominion University.

He later served on the Virginia Tech Board of Visitors.

“Charlie was a pioneer among young black Virginians in the 1950s. He helped knocked down barriers at Virginia Tech that opened the doors for others to follow,” said Charles W. Steger, president of Virginia Tech. “He will be long remembered throughout this academy for his many accomplishments.”

“Charlie was a gentle soul, a wonderful teacher and a role model when we desperately needed one. He leaves a significant legacy for the College of Engineering,” said Paul Torgersen, dean of the College of Engineering from 1970 to 1990 and subsequently president of Virginia Tech from 1993 to 2000. Yates’ presence is felt on campus to this day. In 2003, the Peddrew-Yates Residence Hall was dedicated, and in 2005, the Yates Projects ambassador program was established. The program pays current students for recruitment visits to potential freshmen in their home areas during school breaks. It is coordinated through the Office of Admissions.

A university-wide memorial service was held November 5 in Yates’ honor. Hundreds of people attended.

For several months in 2010, a group of Virginia Tech College of Engineer- ing students became household names across America. Fighting Gravity – a performance group that uses white costumes in black lighting to create eerie, other worldly dance moves – appeared on the NBC television show “America’s Got Talen- ce.”

The group – made up of Virginia Tech Pi Kappa Alpha fraternity members who first performed on campus – finished third on the show, but soon set out on a national tour.

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Student group shines light on Virginia Tech

Ken Carey is 2010 Visiting Scholar

John A. Carey, award winning writer and editor, with three decades of experi- ence covering science, medicine, the en- vironment, and other areas for magazines including Business Week, The Scientist, and Newsweek, visited Virginia Tech as part of the College of Engineering Visiting Scholar program.

His Sept 21 talk “Why Scientists Should Help Stop the Decline in Journal- ism” drew a packed room of students and faculty.

The program is funded by a gift from engineering alumnus Bob Jebson of Culpeper, Va., a 1956 metallurgical engineer- ing graduate and a member of the Col- lege of Engineering’s Committee of 100.

Carey also is director of the Evert Clark/Seth Payne Award for Young Sci- ence Journalists, responsible for manag- ing the science writing contest for journal- ists under the age of 30.

Help the Virginia Tech College of Engineering invent the future with an estate gift that allows you to retain full control of your assets throughout your lifetime, as well as flexibility to change your gift. Simply name the Virginia Tech Foundation, Inc., in support of the College of Engineering, as a beneficiary in your will or trust, or as a beneficiary of your IRA or other retirement plan. Estate giving is one of many ways to combine your support for the College of Engineering with other personal and financial goals. Call Erin Edwards at (866) 271-6819 or visit www.givingto.vt.edu to learn more.

Stay connected

Alumni networking opportunities: www.alumni.vt.edu/hnn. Visit this site for the college’s pre-game football tailgate party gatherings, which were not finalized as of press time.

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