Veterinary College receives record research grant

By Jeffrey S. Douglas

The largest research grant in the 20-year history of the Virginia-Maryland Regional College of Veterinary Medicine has been awarded to a group of researchers working on the development of new instructional technologies that help develop students’ analytical reasoning skills.

The United States Department of Education will provide $1.24 million in funding through their “Learning Anywhere, Anytime Partnership” program to support the continued development and broader application of the researchers’ “Problem List Generator” software technology, according to Holly Bender, an associate professor in the college’s Department of Biomedical Sciences and leader of the group.

“We’re absolutely elated by this support,” said Bender, who has been collaborating for five years with researchers in Virginia Tech’s Biomedical Informatics Research Group (BIRG) on the development of computer-based interactive teaching tools.

“A lot of people have worked very, very hard to develop this technology to a point where a grant of this stature and magnitude is possible. Words can’t capture the sense of excitement we feel about this.”

The PLG software technology challenges students to develop distinctive reasoning and higher-order thinking skills as they apply fact-based knowledge in making diagnostic assessments. While originally developed to help train veterinary students improve their clinical-pathology abilities, the software can be applied in computer science, marketing, business administration, mathematics, human medicine and other fields where problem-solving is required.

“Our college has made a commitment to sharpen its focus on research in every form during the decade ahead,” VMRCVM Dean Lester Crawford said.

“The need to understand their electronic transport properties. Di Ventra, a theoretical physicist, employs molecular wires in electronics, they could solve the problem. Molecules are orders of magnitude smaller than current devices, and therefore we can put more of them into a single chip.”

However, before researchers can actually employ molecular wires in electronics, they need to understand their electronic transport properties. Di Ventra, a theoretical physicist, hopes to understand how electrons behave when traveling into regions as small as a few atoms. Di Ventra does computer simulations of the way electron devices work in transporting current.

“The proposal funded by the new NSF grant is related to one problem that is both fundamental and applied,” Di Ventra said. When electric current passes through a device, the alternative solutions. Electron devices made up of molecular wires could solve the problem. Molecules are orders of magnitude smaller than current devices, and therefore we can put more of them into a single chip.”

By Sally Harris

Research proposals by nanoscience researchers Massimiliano Di Ventra of the Department of Physics in the College of Arts and Sciences and a joint effort of Randy Hefflin of the Virginia Tech and Van Cott of chemical engineering in the College of Engineering will receive Nanoscale Exploratory Research (NER) grants from the National Science Foundation (NSF).

In particular, they will explore the nanoscale world through computer simulations and a combination of optics, thin-film technology, and analytical biochemistry.

The NER grants were solicited within the National Nanotechnology Initiative last year, with only four grant submissions allowed per university. Di Ventra’s, Hefflin’s and Van Cott’s proposals were among the approximately 40 funded out of 260 submitted nationally. Each will receive $100,000 in seed money to spur exploratory nanoscience research.

At the nanoscale level, (a nanometer is one billionth of a meter, or 10,000 times smaller than the width of a human hair), scientists can possibly develop revolutionary ways of making materials and products that will greatly increase the speed of electrical processes and reduce the power needed to run the devices.

The problem with current silicon-based technology, Di Ventra said, is that, in the coming years, it will reach the physical limits of the number of transistors that can be integrated into a single chip. “The larger the number of transistors in a single chip, the larger our computational capacity,” he said. “We need to come up with alternative solutions. Electron devices made up of molecular wires could solve the problem. Molecules are orders of magnitude smaller than current devices, and therefore we can put more of them into a single chip.”

However, before researchers can actually employ molecular wires in electronics, they need to understand their electronic transport properties. Di Ventra, a theoretical physicist, hopes to understand how electrons behave when traveling into regions as small as a few atoms. Di Ventra does computer simulations of the way electron devices work in transporting current. “The proposal funded by the new NSF grant is related to one problem that is both fundamental and applied,” Di Ventra said. When electric current passes through a device, the
Committee seeks university input for dean search

By Clara B. Cox

The university community will have an opportunity to learn about the search process for a new dean of the Graduate School, provide comments on the process, and suggest names of possible candidates during a series of forums scheduled in late October.

The first forum, to be held Tuesday, Oct. 23 from 5:45-7 p.m., will connect the university’s extended campuses via V-Tel connection to the Search Committee in 123-A Burruss. Sites on the extended campuses will be room 3 at the Hampton Roads Extended Campus, room 206 at the Virginia Tech Northern Virginia Center, room 108 at the Roanoke Higher Education Center, room 243 at the Southwest Virginia Higher Education Center, and room 108 at the Virginia Tech-Richmond Center.

The second forum will target faculty and staff members and students on the Blacksburg campus. It will be held 4:30-5:30 p.m. on Thursday, Oct. 25, in 150 Squires.

The final forum, which is for all Graduate Student Assembly representatives and interested graduate students, will be from 5:30 to 6:30 p.m. Thursday, Oct. 25 in 341 Squires.

“The dean of the Graduate School is a critically important position in achieving the university’s goals of growing the graduate-student population, creating new graduate programs in both traditional fields and in new interdisciplinary areas of study, and nurturing new faculty,” (See COMMITTEE on 4).
WHC president to lecture here

Bill Howard, president of Wildlife Habitat Council (WHC), will give a lecture Thurs., Oct. 18, from 3 to 4 p.m. at the Virginia Tech Biotechnology Center on “Certification of Wildlife Habitat Restoration Projects and Conservation Education Programs at Corporate Sites.”

This is the third lecture of the Public Lecture Series sponsored by the College of Natural Resources. All lectures, except for November 29, are scheduled from 3-4 p.m. Thursdays in Fralin Auditorium. More information is available at http://fralinandervt.edu/week.phtml. The November 29 lecture will be held in 315 Cheatham from 3-4 p.m.

CHEW program features soprano

The final CHEW 2001 event, “Re-imagining the idea of the great composer,” will be held in Squires Recital Hall on Wednesday, Oct. 17, at 8 p.m.

The program will consist of a lecture-recital, “In a Woman’s Voice,” by Laura Mann, soprano. The event is open to the public at no charge.

Mann is a professional concert singer who is presently a touring artist for the Virginia Commission for the Arts.

The first half of “In a Woman’s Voice” is historical, featuring songs from the 17th, 18th, and 19th centuries, sung to piano accompaniment. The second half presents new sounds by outstanding living American women composers, sung with piano and taped synthesizer.

One soprano is lecturing, which makes the recital highly informative as well as aesthetically rewarding and entertaining. Of special interest are selections from The Vine of the Soul by Judith Saint Croix, concerning the wise use of rain samples.

PROFESSORS

Continued from 1

current can fluctuate around its average value. If these fluctuations, known as shot noise, are too large, the devices cannot be used in practice, he said. Di Venta is attempting to understand the role of the atomic ion and therefore will shed more light on this phenomenon in molecular devices, he said.

Working in an entirely different area of nanotechnology, experimental physicist Hefflin said Van Cott are attempting to develop new sensor approaches for detecting the presence of biological entities—such as pathogens, DNA, or biological compounds—in an environment or a sample.

VETERINARY

Continued from 1

of the events leading up to a crash, or near crash, event.

“This is the largest instrumented-vehicle study ever attempted and will provide a wealth of new information to help understand, and eventually reduce, vehicle crashes,” VTI Director Tom Dingus said. Dingus, long-time driving-safety researcher, and Vicki Neale, leader of the Institute’s Safety and Human Factors Group, will serve as the project principal investigators. “This project will provide a unique opportunity to study drivers’ performance in their own vehicles in real traffic conditions,” Neale said.

“Study will help to bridge gaps in information that we gain from exploring driver performance in a controlled environment and analyzing crashes after they occur.”

Gary Allen, director of VDOT’s Transportation Research Council, was interested in co-sponsoring the work because of its potential contribution to VDOT’s overall mission of making driving safer for Virginia residents.

The research using the NER grant will focus on the detection of DNA, Van Cott said. With the Human Genome Project in the spotlight and genomic-based medicine looking to see what genes are expressed in healthy versus diseased tissues, these findings will guide therapy and research dealing with those diseases. Most existing DNA-screening systems require active labeling, such as a fluorescent labeling of the sample DNA, and this labeling brings in another experimental step that can possibly introduce uncertainties, he said.

“Our system does not require labeling of the sample DNA, and so we believe that our method, combined with the unique optical properties of the sensor platform, will be more sensitive, more reliable, and still have the high throughput, or ability to look for thousands of genes at the same time,” Van Cott said.

Hefflin and Van Cott’s research under the NER grant builds on a grant they currently have with Harry Gibson of chemistry in Arts and Sciences and Rick Davis of chemical engineering. That project’s goal is to develop self-assembled films of nanometer-scale thickness, particularly those films that have non-linear optical properties, Hefflin said.

“In that project, the self-assembled films grow in alternate layers of two different materials,” Hefflin said. “One of the two materials is specific for nonlinear optical properties. The other material is a dye. When we put on a layer of the second material, it causes a decrease in the signal we observe in the intensity of light at the new harmonic frequency. Just the outermost layer causes the decrease. If we can find a way to specifically attach certain materials to the outer surface, and have them cause a decrease, we would see the decrease if that target material was present, in a solution, for example.”

Basic research, Hefflin, and Van Cott are modifying the nonlinear optical (NLO) materials so they have a biochemical group on them that recognizes only the target materials.

“People propose to use complementary DNA molecules so that, if we want to look for a particular DNA sequence, we can take a complementary sequence, attach it to the NLO material, and deposit it in a nanometer-thick film.”
Morgan named director of Wireless Telecommunications Center

By Susan Tralove

George E. Morgan, Suntrust professor of finance, has been named the new director of the Center for Wireless Telecommunications (CWT), according to James B. Blair, associate provost for research.

CWT is a University Interdisciplinary Research Center of Excellence in wireless and satellite communications, which conducts a broad range of sponsored research and education programs across 10 departments from the colleges of Arts and Sciences, Engineering, and the Pamplin College of Business.

Morgan has been director of the Space and Wireless Business Center since April 1994. His research focus is the economic and regulatory issues arising with space and wireless projects. He has been a principal investigator on a study commissioned by an arm of the U.S. Congress that produced an assessment of the development of the national information infrastructure, on a study for an aerospace firm of the effect of satellite auctions on international business opportunities, and, along with colleagues in engineering and geography, on an NSF-funded project for interdisciplinary coursework on broadband layout, design, and business structure.

He currently leads an interdisciplinary team developing financial/business models for rural broadband wireless and has led the effort to create commercial partnerships for spectrum resources owned by the university. Earlier he led the team that provided mission-critical support for the Virginia Tech Foundation’s path-breaking acquisition of four LMDS licenses in the 1998 FCC auction.

Morgan’s teaching has been focused on commercial banking, financial institutions, theory of finance, and financial/economic strategy for the communications industry.

Charles Bostian, the Clayton Ayre professor of electrical engineering, was the founding director of CWT. He will return to a full time focus on research and teaching responsibilities as an electrical and computer engineering faculty member following over a decade of leadership of the center and its predecessor center. He will continue active participation in the wireless research and education programs of the CWT.

Morgan’s appointment was effective July 1. The Pamplin College of Business has agreed to a re-assignment of his duties beginning Fall 2001 to support the center’s interdisciplinary mission while he continues teaching classes in Pamplin.

Since joining Tech, he served as a visiting scholar at the Commodity Futures Trading Commission and as a visiting lecturer at the International Space University.

Art and Sciences personnel changes detailed

By Sally Harris

Dean Robert C. Bates of the College of Arts and Sciences has named Susan Eriksson associate dean for K-12 science and math education: curriculum and outreach; and Carole Nickerson as director of strategic support for the college.

Eriksson’s charge is to enhance the role of the College of Arts and Sciences in teacher preparation in science and math and to create a more nurturing environment for students who want to be teachers. She also will coordinate the college’s efforts in continuing education for those already teaching.

Nickerson is an associate professor of geological sciences and was executive director of the Virginia Tech Museum of Natural History from 1993 through 2001. She has received funding for research and outreach totaling over $1 million from such sources as the National Science Foundation, the Howard Hughes Medical Institute, Virginia Council for Higher Education, and the Institute of Museum Services.

Nickerson, who served as assistant to Virginia Tech presidents, joined the English department as an instructor in 1986 and taught there until 1989. Among her duties was coordinating the graduate teaching assistants’ (GTA’s) training program.

In 1989, Nickerson became assistant to President James McComas. She served as executive assistant to President Paul Torgersen throughout his tenure as president. She retired after 18 months when Charles Steger became president to help with his transition before she retired. As director of strategic support, Nickerson will work with departments and other colleges in the university to assist in advancing initiatives and building collaborative relationships that will maintain, grow, and develop a culture of excellence.

Researcher report on dental study

By Stewart MacInnis

Dental cavities in teenagers and young adults are not linked to soft-drink consumption. Virginia Tech researchers reported to the annual meeting of the American College of Nutrition. The findings of Rich Forshee and Maureen Storey, research faculty members with the Center for Food and Nutrition Policy, are based on an analysis of a large, nationally representative nutrition-and-health survey conducted by the federal government.

“Our study shows that age is related to dental cavities,” Forshee said. “The older we get, the more problems we are likely to encounter.”

Forshee said the data show regular consumption of carbonated soft drinks is not associated with dental cavities among adolescents, young adults, or older adults. There was, however, a positive association between socio-economic status and dental cavities among adults in the 25-40 age group. Among those over 40, the study found that African Americans, Mexican-Americans, and respondents of “other races” have fewer dental cavities than do Caucasians. Mexican-Americans in the 25-40 age group also reported fewer cavities than Caucasians.

The study by Forshee and Storey used data from the national Health and Nutrition Examination Survey III. The study was supported by an unrestricted grant from the National Soft Drink Association.

Committee continued from 2

to excellence the broad range of graduate programs already in place,” said Susan G. Magliaro, Search Committee chair.

The committee, she said, “is seeking an experienced, effective, and innovative leader who can create and carry out the vision to move the Graduate School and the institution as a whole toward achieving its goals in graduate education.”

The position description is available on the provost’s web site at http://www.provost.vt.edu.