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TODAY'S EDITION
See page 3 for
information on
Disability Awareness
Month speaker.

VBI's Pathogen Portal project receives additional \$4.9 million

By Susan Bland

The Virginia Bioinformatics Institute (VBI) has received \$4.9 million in additional funding from the U.S. Department of Defense (DoD) for its PathPort (Pathogen Portal) project. This additional DOD funding will help VBI continue to develop the already-established project.

PathPort is a life-sciences interoperability framework that provides access to biological characterizations of known pathogens and their near relatives, and the tools to analyze and interpret the data. The project has opened the door for users to more effectively combat infectious diseases by providing access to relevant data and tools to analyze, manage, visualize, and extend existing and developing data sets. Through integration with VBI's Core Laboratory Facility (CLF), VBI scientists and collaborators have access to a unique infrastructure for data generation, management, analysis, and dissemination.

"The continuation of this project provides increased capabilities and infrastructure for our nation to meet its needs in combating infectious diseases," said VBI professor and Director Bruno Sobral.

Biological data sets are growing exponentially as a result of genome-sequencing projects and other new technologies. Sobral and his Cyberinfrastructure Group are building PathPort as a set of web-services to consolidate, annotate, validate, disseminate, and analyze available pathogen data from disparate sources through an interoperable life-sciences framework built on open community standards. Current analytical tools in PathPort allow for the creation of new data models, analysis of genomic, transcriptomic and curated literature data, as well as the discovery of novel inter-data relationships. The client side of PathPort is ToolBus, a "bus" for connecting data and tools and viewing results through a single, consistent user interface. Sobral's Cyberinfrastructure Group is working with

diverse communities to create a common set of data communication standards to allow scientists across the globe to evaluate data and discover new relationships through a common platform.

Data in PathPort focus on host-pathogen-environment interactions, thus poised to aid in detection, identification, and analysis of high-priority pathogens that have potential to cause significant harm in either a naturally occurring, accidental, or deliberately introduced disease outbreaks. ToolBus/PathPort allows researchers to explore curated pathogen information and molecular mechanisms of pathogenesis from diverse sources.

Using its high-performance computational infrastructure and a world-class team of biologists and computer technologists, the Cyberinfrastructure Group will continue to develop PathPort as a key to unlock the door to the acquisition of more powerful knowledge for infectious-disease research.

Human cloning subject of choices forum

By Jean Elliott

Choices and Challenges at Virginia Tech will hold a public forum entitled "On the Eve of Human Cloning," a day-long series of panels and discussions to be held on Oct. 28 at the Donaldson Brown Hotel and Conference Center. This forum is open to the public at no charge.

"The reality of reproductive and therapeutic human cloning is with us. Both types of cloning involve complex social and ethical dimensions that merit public discussion," said Choices and Challenges co-director Eileen Crist of the Department of Science and Technology in Society. The forum is designed both to inform and to provide an opportunity for public participation in debate on this topic.

The main panel discussion will take place at 11 a.m. and feature a number of nationally recognized experts on issues of human cloning, representing a range of views and areas of expertise.

Wendy Goldmann Rohm is an investigative journalist and author of the forthcoming book, *The Eighth Day: On the front Lines of Stem Cell Research and the Countdown to a Human Clone*.

Barbara Katz Rothman, a sociologist at the City University of New York, has written extensively on genetic engineering and reproductive technologies, and is the author of *The Book of Life: A Personal and Ethical guide to Race, Normality, and the Implications of the Human Genome Project*.

Lee Silver is a professor of molecular biology at Princeton University and the Woodrow Wilson School of Public and International Affairs. He is the author of *Remaking Eden: How Genetic Engineering and Cloning Will Transform the American Family*.

Lee Zwanziger is a biomedical ethicist and Senior Research Analyst on the President's Council on Bioethics. She is an adjunct professor in the Department of Science, Technology, and Society at Virginia Tech.

A range of sessions will be held both before and after the main panel, covering topics of bioethics, religious perspectives on cloning, animal cloning, legal issues, and broader cultural and social implications of cloning.

In conjunction with the Choices and Challenges Forum, Virginia Tech's Theater Arts Department will present the play, *A Number*, by British playwright Caryl Churchill. The play dramatizes our anxieties about our individuality and identity that are stirred up by the looming possibility of cloning. It will be performed at 5 and 8 p.m. in the Squires Student Center Studio Theatre Oct. 27 through 29.

(See CLONING on 3)

University to share Tree of Life grant

By Sally Harris

A \$3-million National Science Foundation (NSF) Tree of Life grant is enabling researchers from Virginia Tech and six other laboratories to lead the way in reclassifying the 270,000 species of flowering plants that include all our food plants.

The NSF grant allows scientists from seven laboratories—at Virginia Tech, the University of Florida and Florida Museum of Natural History, Yale University, the University of Michigan, the University of California at Davis, the University of Wisconsin at Madison, and the University of Washington—to combine expertise to solve existing classification problems and develop formal regrouping and reclassification of these plants. The areas of expertise include genes and genomes, morphology and anatomy, fossil records, and computer modeling of such things as the time of origin.

Molecular biology and gene sequencing have changed the concept of plant evolution. "We thought for awhile we understood the classification, relationships, and date of origin and divergence of these plants," said Khidir Hilu, professor of biology. Formerly, flowering plants, which are the most dominant plant on the surface of the Earth and economically the most important, were classified by flower and leaf as monocots, such as orchids, and dicots, such as tomatoes, oranges, and cotton, Hilu said. Now, based on information from the genes, flowering plants are classified into a basal group that includes both monocots and some dicots

(See UNIVERSITY on 4)



PRE-GAME TUNEUP Lots of scores meant frequent cannon fire both before and especially during last Saturday's 62-0 victory over Florida A&M (J. McCormick)

NSF awards engineering education \$1 million

By Lynn A. Nystrom

The National Science Foundation (NSF) has awarded \$1 million to a team of faculty members to enhance part of the undergraduate curriculum in the Department of Biological Systems Engineering.

The curriculum, bioprocess engineering, is a relatively new area in the emerging field of biotechnology. It encompasses a wide range of engineering practices involving the use of biological feedstocks for the production of food, fiber, and other value-added products such as pharmaceuticals, biofuels, plastics, and industrial enzymes.

Graduates of this option normally work in the food, pharmaceutical, and biotech industries, or with numerous other companies that manufacture bio-based industrial products.

The three-year NSF award comes at the same time as the Department of Engineering Education (EngE) at the university is revamping

its curricula to expand from offering only freshman-level courses to offering graduate degrees in engineering education. The Department of Engineering Education will continue to provide a modern, student-focused introduction to engineering for freshmen, and it will place a new emphasis on conducting research and offering courses and programs to alleviate the national shortage of engineering and technology instructors.

The National Academy of Engineering has lauded these efforts, citing Virginia Tech for initiating a "groundbreaking degree program in engineering education."

With the NSF's support, several members of the Department of Engineering Education faculty are now reaching out to improve engineering teaching practices with departments associated with the college. This unprecedented collaboration between

(See NSF on 4)

ACTIVITIES

(Editor's note: For timely and expanded events information, go to the Virginia Tech Events Calendar at <http://www.calendar.vt.edu/main.php>.)

EVENTS

Friday, 22

POSTPONED Center for Information Technology Impacts on Children, Youth and Families Lecture: Yasmin Kafai, UCLA.

Saturday, 23

**Parents' Day.
VT Open House.**

Sunday, 24

VT Open House.

Tuesday, 26

**Web Course Request Ends.
Disability Awareness Speaker,** 10 a.m., DBHCC auditorium: Paul Hippolitus.

Wednesday, 27

"With Good Reason," 7:30 p.m., WVTF.

Thursday, 28

Choices and Challenges Forum, 7:30 a.m., Donaldson Brown Hotel and Conference Center: "On the Eve of Human Cloning."

Football, 7:30 p.m.: At Georgia Tech.
"Classical Music and Mountains," 7:30 p.m., Squires Recital Salon: Pianists Kent Holliday and Nick Ross.

Friday, 29

Music, Myths and Mountains Conference, Donaldson Brown Hotel and Conference Center: Through 10-30. Call 6080 for more information.

"Words and Music: An Evening with Sharyn McCrumb and Jack Hinshelwood," 7:30 p.m., Donaldson Brown auditorium.

Saturday, 30

"Fiddle Tunes of the Frontier," 7:30 p.m., Donaldson Brown auditorium: Alan Jabbour and James Reed.

Sunday, 31

Ensemble Concert, 3 p.m., Squires Recital Salon.

NOVEMBER

Monday, 1

**Pay Date for Faculty and Staff Members.
University Council,** 3 to 5 p.m., 1045 Pamplin.

Tuesday, 2

VTU Program, 7:30 p.m., Burruss auditorium: Shangri-La Acrobats.

Wednesday, 3

"With Good Reason," 7:30 p.m., WVTF.

Friday, 5

Women's Studies Research Seminar, noon, 132 Lane Hall: Tom Ewing.
New River Valley Symphony, 8 p.m., Burruss auditorium.

SEMINARS

Friday, 22

MCBB, 12:20 to 1:10 p.m., 102 Fralin: Jerry Dodgson, Michigan State.

Geosciences, 3:30 p.m., 4069 Derring: Barbara Bekins, USGS.

Thursday, 28

Statistics, 3:45 p.m., 409 Hutcheson: J.D. Williams.

Friday, 29

MCBB, 12:20 to 1:10 p.m., 102 Fralin: Jim Westwood.

Geosciences, 3:30 p.m., 4069 Derring: William Holt, SUNY—Stony Brook.

NOVEMBER

Thursday, 4

Statistics, 3:45 p.m., 409 Hutcheson: Harry Khamis.

Friday, 5

MCBB, 12:20 to 1:10 p.m., 102 Fralin: Allen Jones.

BULLETINS

Water Resources seminar scheduled

The American Water Resources Association, Virginia Tech student chapter, will present its first fall seminar for 2004 entitled "Strategies for Advancing Environmental Legislation in the U.S. Congress."

The seminar will be presented by Karen Wayland on Friday, Oct. 22 at 4 p.m. in Fralin auditorium.

Wayland is legislative director for the Natural Resources Defense Council (NRDC). She works with NRDC staff to develop strategies for advancing environmental legislation and lobbies Congress on behalf of the organization.

Refreshments will be provided. For more information, go to <http://www.vtawra.org.vt.edu/>.

Hokie Harvest Sale set

The tenth Virginia Tech Hokie Harvest Sale student-organized beef-cattle and equine production sale is scheduled for 6 p.m. Friday, Oct. 29, on Plantation Road off of Prices Fork Road in Blacksburg. Horse demonstrations begin at 3 p.m. in Campbell Arena, and buyer registration for both beef and horse sales begins shortly thereafter at 3:30 p.m. The horse sale and beef-cattle sale will begin at 6 p.m. in Campbell Arena and 6:30 p.m. in the Livestock Judging Pavilion respectively. There is a wide variety of horse breeds and ages among the 27 horses in this year's sale, and the beef-cattle program is offering 40 head of Angus, Simmental, Gelbvieh, and Hereford cattle of various ages and sexes.

Funds generated via the Hokie Harvest Sale are reinvested into the beef-cattle and equine-science programs. In the past nine years, the Hokie Harvest Sale has generated over \$830,000 to augment funding in these areas.

For more information, visit websites www.equine.vt.edu for information on the equine science program as well as the horses in the Hokie Harvest Sale, and www.apsc.vt.edu/centers/beef/beefcenter.html for pictures of beef cattle and facts about the breeding program. Call Dan Eversole at 1-4738 for questions about beef cattle, and Ann Dunnington at 1-9179 regarding horses in the sale or the equine-science program.

Charter University Open Forum set

The Staff Senate will join with the Commission on Classified Staff Affairs for its Nov. 18 meeting from 11:30 a.m. until 1:30 p.m. to hold an open forum regarding the

Charter University. The meeting will be held in the Donaldson Brown auditorium. All classified staff members are invited to attend. For more information, contact Sue Ellen Crocker at 1-6493 or go to www.career.vt.edu.

PeopleAdmin training sessions set

Beginning in early November, all faculty searches will be handled through the online application process, PeopleAdmin. All jobs are currently posted at <http://www.jobs.vt.edu> and applicants will now be required to apply for any faculty opening by submitting their application and attaching required documents, such as a resume and cover letter.

Guidance on how to use PeopleAdmin is available to the applicant on the application site. A manual is available for hiring managers at <http://www.ps.vt.edu/supervisorscorner/>, and a brief guidebook for search committee members ("guest users") is available at same site. The EO Office has revised the Faculty Search procedures manual to incorporate the use of PeopleAdmin and it will be posted on their website. The online system eliminates the need for paper EO forms (Forms EO1-6) to be submitted, except in the case of a request for an exemption to search. New search exemption forms for both regular and special research faculty have been posted on the Personnel Services forms site (<http://www.ps.vt.edu/forms/>).

Departments initiating faculty searches this fall are strongly urged to send those who are expected to be involved to one of the training sessions listed below. Those who should come include the departmental administrative assistant (if expected to play a role in preparing the posting and managing applicant flow), search committee chair(s), and the department head.

The training session will show how to manage searches using PeopleAdmin and to become more familiar with features that are available for posting position and handling applications. Training dates are Tuesday, Oct. 26 from 8:30 a.m.-10:30 a.m.; Tuesday, Nov. 2 from 1:30 until 3:30 p.m.; Monday, Nov. 8 from 8:30 until 10:30 a.m.; Friday, Nov. 12 from 1:30 until 3:30 p.m.; Monday, Nov. 15 from 8:30 until 10:30 a.m.; Friday, Nov. 19 from 8:30 until 10:30 a.m.; Tuesday, Nov. 30 from 1:30 until 3:30 p.m., and Friday, Dec. 3 until 8:30 until 10:30 a.m. The location for all classes is room 153 Southgate Center.

It is important to sign up in advance by sending a note to hrrisuser@vt.edu so that appropriate authorization can be established before the training session.

ASPIRES workshop offered

ASPIRES is Virginia Tech's internal grant program, and this year's awards will be in two categories: 1) Capital Renovations; and 2) Unrestricted Research Grants. For both renovation and research grants, particular emphasis will be on helping new (untenured) faculty members who have not yet been successful attracting extramural funding. Proposals are invited from all disciplines.

A special workshop will be held on Friday, Nov. 12 from 3 to 4:30 p.m. in Fralin auditorium to acquaint potential applicants with ASPIRES goals and objectives, eligibility requirements, review criteria and application procedures. Due to the requirement for significant cost sharing and letters of support, it may be advisable for department heads and deans to attend as well.

The proposal deadline is Jan. 31, 2005, but a letter of intent is due Dec. 23, 2004. The ASPIRES program announcement and application forms can be downloaded from <http://www.research.vt.edu/aspires/>.

To register for the workshop, contact Debbie Nester at debbiell@vt.edu or phone 1-5410. For more information, contact Bob Porter at reporter@vt.edu or phone 1-6747.

Strengthen grant proposals

The Office of the Vice President for Research is offering a workshop on "Strengthening Your Grant Proposal: Building in quality outreach and diversity components." The program will be Monday, Nov. 15, from 3 to 4:30 p.m. in Fralin auditorium.

Many sponsors, especially federal agencies, are placing heightened emphasis on education, outreach, and diversity as key review criteria. This workshop will focus on resources available at Virginia Tech—people and programs—that can help grant writers build in strong outreach and diversity components.

Presentations will feature an overview of Virginia Tech's Outreach Resources, discussion of NSF's "Broader Impacts" policy, descriptions of sample outreach programs, and perspectives from faculty members who have written outstanding outreach and diversity components into their award-winning proposals.

Seating is limited, so participants should register beforehand. Contact Debbie Nester, debbiell@vt.edu or call 1-5410.

(See BULLETINS on 3)

BULLETINS

BULLETINS

Continued from 2

Open reservations requests sought

The Event Planning Office announces open reservations for events sponsored by departments during the spring and summer semesters (Jan. 3 through July 31, 2005) for all venues (Squires Student Center, Johnston Student Center, and Burruss auditorium) on Monday, Nov. 8. Office hours are 9:30 a.m. until 5:30 p.m.

Requests will be accepted in person (221 Squires), by phone at 1-9047, or e-mail schedule@vt.edu.

Calendar-management to be studied

The Center for Human-Computer Interaction at Virginia Tech is studying how people organize their calendars and how different computing platforms (desktop, web, pda's) are used for calendar management. The information gathered will help create guidelines that will improve the design of online calendar-management tools. The study has been approved by Virginia Tech Institutional Review Board # 04-470.

Participants will be asked to complete an online survey (about 10 minutes) on the use of calendar software. Those who are interested in participating should visit <http://perez.cs.vt.edu/calendaruse/> and fill out the online survey.

Call Manuel A. Perez-Quinones directly at 1-2646 or e-mail perez@vt.edu.

New small-grants program announced

Outreach and International Affairs (OIA) and the Office of International Research, Education, and Development

(OIRE) have announced a new competitive small-grants program to support international program development at Virginia Tech. Applicants may apply for a limited number of grants for up to \$1,000 to support curricular projects for development of academic programs dealing with global issues; academic or research development projects to position grantees for larger external funding; and the cost of planning and administering education abroad or student-exchange programs.

The due dates for two cycles of awards are Nov. 15 and March 15. For more information, go to http://www.oired.vt.edu/Education/faculty/faculty_grants.htm.

Duck Pond Drive entrance closed

The construction entrance off of Duck Pond Drive will be closed on Oct. 25 and will remain closed for approximately 30 days to allow the contractor to construct the new permanent entrance. During this time, the main construction entrance for the project will be off of West Campus Drive. Once the new permanent entrance has been finished it will be reopened as the main construction entrance.

Manufacturing center hosts meeting

The Center for High Performance Manufacturing (CHPM) at Virginia Tech will host its fall meeting on Nov. 10 and 11 at the Holiday Inn (formerly the Four Points Sheraton) in Blacksburg.

In addition to academic presentations, two keynote speakers from the manufacturing community will be present. Tim Baechle, manufacturing manager of General Electric, and Jim Talley, director of aircraft systems engineering of General Dynamics will speak.

CHPM works to help manufacturing firms research,

develop, and implement new processes, methods, and technologies to stay competitive in today's dynamic manufacturing environment. Work is performed in wide variety of areas, ranging from supply chain design and flexible automation to rapid prototyping and low-cost composite manufacturing.

The meeting is open to the general public. There is no cost to attend but registration is required. For more information and to register, visit www.chpm.ise.vt.edu.

Recycling phonebooks, directories

Phonebooks and campus directories can again be recycled this fall at the VTR Recycling Station located in the Overflow Parking Lot, immediately west of the Duck Pond. The collection bin for these books and directories has been clearly labeled; do not use the bin for other books or papers. The bin will remain in place through the end of February, 2005.

To get to the Overflow Lot, take Washington Street west until it ends at The Cage (student parking lot). Take a right down the hill on Duck Pond Drive. Pass Smithfield Rd on your left, and then as Duck Pond Drive begins to veer to the right around the Duck Pond, take a left on Oak Lane. Turn into the Overflow Lot from Oak Lane. Drive to the southwest corner of the lot and look for a large bin for paper (sorted office paper/newspaper, glossy magazines and catalogs), and smaller bins for corrugated cardboard, phonebooks and campus directories, and commingled containers.

For more information, contact the VTR office at 1-9915 or e-mail recycle@vt.edu.

Federal programs director to speak for disability awareness in employment

By Clara B. Cox

Paul Hippolitus, director of programs for the Office of Disability Employment Policy in the U.S. Department of Labor, will talk about "Employing People with Disabilities" at 10 a.m. on Tuesday, Oct. 26, in the Donaldson Brown Hotel and Conference Center auditorium. October is Disability Awareness in Employment Month.

Virginia J. Reilly, ADA coordinator, said Virginia Tech "is fortunate to have Hippolitus visit the campus. Paul Hippolitus is one of the highest-ranking federal officials dealing with disabilities in this country. He oversees numerous disability programs such as High

School/High Tech and the Workforce Recruitment program. This is a rare opportunity to learn how we can broaden our diversity efforts and extend access to our students and employees."

Hippolitus will discuss the impact and importance of hiring people with disabilities and recruiting employees and students with disabilities. A 30-minute question and answer session will follow.

The speaker will be introduced by Bill Staderman, a Virginia Tech alumnus and Navy acquisitions intern in the Human Systems Integration group with the Naval Surface Warfare Center.

For additional information or if you are a person with a disability who will need an accommodation to participate in the event, contact Jerri Fylpa at 1-4638 (V), 1-7227 (TTY), or adainfo@vt.edu.

The event is sponsored by the Americans with Disabilities Act Office, Office of Multicultural Affairs, and Personnel Service.

Association of American Railroads picks university to host new research lab

By Liz Crumbley

Railroad traffic—both freight and passenger—has increased to record levels in the United States during the past few years, and the railroad industry is in need of new technologies to help ensure the future of railway infrastructure and operations.

The Association of American Railroads (AAR) has chosen the College of Engineering to host an affiliated laboratory for research in critical technical areas. The AAR, whose members include Amtrak and the major freight railroads in the U.S., Canada and Mexico, is the world's leading railroad policy, research and technology organization focusing on the safety and productivity of rail carriers.

The AAR agreement with Virginia Tech includes an annual grant of \$200,000 that the engineering college will use to establish the Railway Technologies Laboratory.

"This relationship will forge closer ties and research collaborations between the

university and the railroad industry, opening up new funding opportunities from private and government sources," said Mehdi Ahmadian, professor of mechanical engineering professor who will serve as director of the new laboratory.

The association also supports affiliated labs at Texas A&M and the University of Illinois at Urbana-Champaign. To secure the third lab, Ahmadian said, Virginia Tech competed against a group of schools that included Pennsylvania State University and the University of California-Berkeley.

Virginia Tech engineering faculty members conduct research in a broad spectrum of technological areas important to the railroad industry, including wireless communications, sensor technology, railroad-vehicle dynamics simulation and modeling, smart materials, and technologies for improving railroad operational efficiency, safety and security.

"Our selection as the host for the Railway
(See ASSOCIATION on 4)



VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY

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Editor

John Ashby, 1-6961

News Bureau Manager
Susan Dickerson 1-8508

Production Manager
Melinda Shaver, 1-8524

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CLONING

Continued from 1

"We are very fortunate to have an acclaimed play by a world-class playwright that is a perfect fit with the themes of the forum," Daniel Breslau, co-director of Choices and Challenges said. Following performances of this play on Oct. 27 and 28, the audience will take part in an interactive discussion with the cast, director, and experts participating in the forum.

The Choices and Challenges Project was founded in 1985, and has presented annual forums on issues of public concern involving science and technology.

For more information, contact Choices and Challenges at choices@vt.edu, or by visiting the website at <http://www.cddc.vt.edu/choices/>.

EMPLOYMENT

For more information on all faculty and classified-staff positions, see www.jobs.vt.edu.

INSTRUCTIONAL

Crop/Soil Environmental Science. Assistant Professor.

Biomedical Sciences/ Pathobiology. Clinical Instructor.

NON-INSTRUCTIONAL Department of Human Nutrition, Foods/Exercise. Head.

University Development. Assistant Director for Intercollegiate Athletics.

Education Leadership/Policy Studies. Information Specialist.

Reynolds Homestead Forest Resource Center. Superintendent.

Services for Students with Disabilities. Coordinator.

Institute for Distance/Distributed Learning. Assistant/Associate Director for Research/Assessment of Teaching/ Learning in Electronic Environments

Institute for Distance/Distributed Learning. Assistant/Associate Director for eLearning Planning/Operations.

Center for Geospatial Information Technology. Project Associate/Senior Project Associate.

Biology, Postdoctoral Associate. Northeast District Cooperative Extension. Crop/Soil Sciences.

Extension Agent, Agriculture/Natural Resources. Farm Business Management, Hanover County.

Central District Cooperative Extension. Extension Agent, Crop/Soil Sciences, Amelia County.

IN OTHER NEWS

Two win White House honors

By Liz Crumbley

Two Virginia Tech engineering faculty members were honored at the White House in September as recipients of the Presidential Early Career Award for Scientists and Engineers (PECASE) for 2003, the highest national honor for researchers in the early stages of their careers.

Harry Dankowicz, associate professor of engineering science and mechanics, and Sandeep Shukla, assistant professor of electrical and computer engineering, were among 57 researchers selected nationally as PECASE honorees. The awards were presented in the Eisenhower Executive Office Building by John H. Marburger III, science adviser to President George W. Bush and director of the Office of Science and Technology Policy.

Dankowicz and Shukla were among 20 National Science Foundation (NSF)-funded researchers to receive PECASE honors.

Dankowicz's development of methods to predict changes in stability and to design against instability in dynamic systems is based in the abstractions of differential equations, but aimed toward practical applications—such as improved ride comfort in automotive suspension systems or wearable devices that could reduce the number of fall-related injuries.

Shukla, who came to Virginia Tech in 2002, is a leading researcher in designing, analyzing, and predicting performance of electronic systems, particularly systems embedded in automated systems. The research that attracted Shukla's PECASE award focuses on power/performance trade-off analysis for designing embedded systems, and includes a related educational component.

UNIVERSITY

Continued from 1

such as magnolias and the true dicots, called eudicots. The new system has broken up several traditional groups and shuffled and mixed others, Hilu said.

The problem is that scientists still don't know where some groups fit and have no formal classification of others. In the past, most people suggested magnolias or buttercups were some of the earliest evolving flowering plants, or the base of the flowering plants tree. Now, Hilu said, a small shrub from New Caledonia called an *Amborella* forms the base, with water lilies coming directly after that. "This indicates a major shift from a shrub of terrestrial habitat to aquatic habitat," Hilu said. "That's a major change in structure and ecology."

Hilu had been researching flowering plants throughout his career with previous NSF grants to Virginia Tech. He also has been working with grasses, the fourth-largest flowering-plant group, which provides 80 percent of the world's food, such as cereal crops. His lab is one of the leaders in that family. With grants from agencies including the U.S. Agency for International Development and the Jeffress Fund, he has studied crops such as rice, peanut, cowpea, and millets, using biotechnological methods, and focused on outreach programs with Kenya and Morocco.

The Tree of Life laboratories will exchange plant and DNA material and gene sequence data, and some labs will focus on analyzing certain aspects of the project. Each laboratory will depend on results from the others, including Hilu's work on the mat-K gene. Then all the data generated at the seven labs will be combined and computer analyzed, a tree of life for flowering plants developed based on molecular information, and information from fossils, anatomy, and

Award-winning geospatial center serves nation's critical emerging needs

By Lynn Davis

The Geospatial Information Technology Center (CGIT), in concert with the College of Natural Resources, the College of Engineering, and other university partners, is using its expertise to assist the state with its hazard-mitigation plan, the nation's capital with its Critical Infrastructure Program, and communities with smart growth.

CGIT was founded last year in Blacksburg and Alexandria. Its goal is to focus on research, education, and applying developing technologies to projects that benefit from Geographic Information Systems (GIS is a computer-based information system that enables users to superimpose different map layers on top of each other) and Global Positioning Systems (GPS is a constellation of 27 satellites that orbit the earth; a GPS receiver acquires radio signals from these satellites and is able to precisely pinpoint a coordinate address on the surface of the earth with such accuracy that can even locate man hole covers).

"Faculty members in various departments at Virginia Tech share their expertise to integrate spatial awareness in intelligent-data-collection methods, in-field analysis, modeling and simulation, visualization, and a host of other techniques in a wide variety of uses," said Randy Dymond, associate professor of civil and environmental engineering and founding director of the center. Faculty members from six colleges contribute expertise for agriculture, infrastructure and transportation, wireless communications, environmental management, public health, homeland security, and smart growth.

morphology imposed on the tree to confirm the relationships and come up with reliable groupings that will be used as the basis for a system of classification. The eventual goal of these projects is to have all flowering plants, algae, mammals, insects, and others put together in a full tree of life.

There are several benefits for doing so. For example, in plants, chemists and biologists searching for compounds in medicinal plants need to know their relatives and ancestors, since families of plants tend to have similar chemistries. Understanding biodiversity in the frame of patterns of relationships is important in the assessment of vegetation dynamics and species extinction due to climatic changes. The new tree would also help in the study of patterns of gene transfers among plant genomes.

The new grant includes money for undergraduates, including minority students and student exchanges, post-doctoral fellows, graduate students, outreach, and chemicals and other supplies for sequencing large numbers of chloroplast genes and genomes of flowering plants.

The geospatial center has been working with federal, state, and local governments, as well as with industry, education, and non-profit organizations. Using layers of location-based information, the center helps government assess risks due to floods, winds, fires, earthquake, and human-caused disasters.

"CGIT has a number of on-going projects," Dymond said. "Besides working on the state's hazard mitigation plan and the Critical Infrastructure in the National Capital Region, we have coordinated the GIS for utilities on the Blacksburg campus and completed a low-impact development design manual for improved storm-water retention.

In addition to these projects, the geospatial center has provided GIS training for professionals and for high-school instructors across the state on GIS basics so they can integrate that teaching into their curricula.

"Our goal is to use our collective expertise to help solve problems using geospatial technologies in ways that haven't been possible until now," Dymond said.

As a new dual-campus center, CGIT has advanced computing facilities in both

Blacksburg and Alexandria. Bill Carstensen, CGIT associate director and geography professor, said, "We are performing some fascinating research that has widespread uses that will be affecting every American in one way or another." Even recreation enthusiasts will be benefiting, because waterways can be digitalized so kayakers, for instance, can know how long a run really is.

For its efforts in forming a state program that allows Virginia's public universities and community colleges access to a common site license to GIS software produced by the Environmental Systems Research Institute (ESRI), the center along with its partners, Virginia Tech's Information Technology Acquisition Department, the Virginia Geospatial Extension Program, and the university's Central Contract Office, recently garnered one of the top international Special Achievement in GIS Awards from ESRI. Virginia Tech was the only university so honored.

The integrated efforts of these departments save the Commonwealth of Virginia more than a million dollars annually in GIS software fees. If Virginia Tech had not devised the share system, few community or other colleges would have been able to afford to offer their students the GIS training.

For more information contact Dymond at 1-9023, (dymond@vt.edu); or Judy Hood at 1-4421 (jhood@vt.edu).

ASSOCIATION

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Technologies Laboratory is the result of AAR representatives being impressed by the research capabilities at Virginia Tech," Ahmadian said.

Research conducted as part of the agreement with AAR will be selected and monitored by the Transportation Technology Center, Inc. (TTCI), located in Pueblo, Colo. The TTCI is the research-and-development arm for the industry members of AAR, said Ed Henneke, associate dean for research and graduate studies in the College of Engineering. Henneke did much of the work in securing the lab for Virginia Tech.

The TTCI committee that reviews and scores research proposals will soon begin the process of selecting the first set of proposals from Virginia Tech.

Ahmadian, who also is director of Virginia Tech's Center for Vehicles Systems and Safety, said one project he hopes to work on is the development of improved technologies for real-time monitoring of railway health, such as new methods for locating damages to railroad tracks and train cars.

NSF

Continued from 1

Engineering and Education faculty members represents seven departments and three colleges.

Virginia Tech created the bioprocess engineering option five years ago, and student enrollment in this option has since increased by a factor of four. The Department of Biological Systems Engineering anticipates a continued growth in this area and is seeking to add three new faculty positions in molecular, metabolic, and fermentation engineering.

The NSF project is under the direction of Vinod Lohani and Jeffrey Connor of the Department of Engineering Education, Kumar Mallikarjunan and Theo Dillaha of the Department of Biological Systems Engineering, and Terry Wildman of the Center for Excellence in Undergraduate Teaching and the School of Education. Additional members of the team include Tamara Knott, Jenny Lo, Richard Goff, and Mike Gregg from engineering education, Mary Leigh, Mike Zhang, John Cundiff, Dave Vaughan, and Foster Aglebor from biological systems engineering, Ed Fox from computer science, G.V. Loganathan from civil and environmental engineering, Greg Adel of mining and minerals engineering, and John Muffo of the University's Academic Assessment Program.

Lohani, the project's principal investigator, said the multidisciplinary effort "will serve as a model for promoting improved undergraduate pedagogy in the other 10 departments of the College of Engineering as well as in other engineering programs. The NSF grant comes on the heels of a 2003 NSF planning grant of \$107,500 for its Bridges for Engineering Education program. That grant is creating a contemporary framework for undergraduate engineering pedagogy."

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