

Research News

In This Issue

2: New Research Link with Botswana

3: Guardians of a World Heritage Site

4: FEST Turns Its Attention to Young Investigators

6: Morphogenesis Symposium Held in May

7: Occupational Health and Safety for Animal Researchers

8: Mobile Applications and Wireless Networking Symposium

FEST Turns Its Attention to Young Investigators

In late 2004, the Office of the Vice President for Research and Graduate Studies launched a new FEST (Funding for Excellence in Science and Technology) Distinguished Young Investigator grant program open to junior faculty members within the first three years of their appointments in science and engineering departments.

This grant program recognizes junior faculty creativity and innovation and seeds projects that are more venturesome than might otherwise be possible at such an early career stage. Award winners work closely with a senior faculty mentor, and it is anticipated that FEST support will enhance their ability to secure prestigious external early career awards from private foundations and federal agencies. This year four awards were made totaling \$150,000, and according to Dr. Ariel Gomez, Vice President for Research and Graduate Studies, the applicant pool was highly competitive.

Irina Mitrea (Mathematics, CLAS) received an award to develop scientific computing techniques in harmonic analysis and partial differential equations. Mitrea intends to develop applications in engineering and also will design an interdisciplinary

course for students in mathematics and engineering. "Many problems arising in disciplines such as mathematical physics, engineering, computer graphics, economics and biology can be expressed in terms of partial differential equations (PDEs)," she notes, and she believes the outcome of her FEST-funded work will have broad applicability. "Above all," she says, "I am honored to receive this distinguished award, which is indicative of this university's strong commitment to promote young researchers. One of the immediate benefits is that this allows me to mentor and lend support to our graduate students who are in critical stages of their careers." She plans to address a number of long-standing mathematical questions about fundamental properties of integral operators associated with elliptic PDEs on non-smooth domains which still remain open. Mitrea's mentor in receiving this award was mathematics professor Irena Lasiecka.

Brett Blackman (Biomedical Engineering, SOM and SEAS) and Brian Wamhoff (Molecular Physiology and Biological Physics, SOM) received a joint award to further their research on cross-talk between human endothelial cells and smooth muscle cells in response to atherosclerotic hemodynamic flow patterns. Atherosclerosis and subsequent myocardial ischemia and stroke are among the leading causes of death in our society. Damage to

First W.M. Keck Foundation Award for Science and Engineering

Don Brown, chair of the Department of Systems Engineering, is the PI for the first award received by U.Va. from the Keck Foundation in science and engineering. The award is to develop technology for a rapid and inexpensive means of using terahertz (THz) radiation to study the form and function of biological materials at the molecular level. With this latest award, the University will establish the W.M. Keck Foundation Center for THz Spectroscopy for Biological Materials.

Faculty members who collaborated on the protocol include Robert Weikle, Boris Gelmont, Tatiana Globus and
continued on page 3

endothelial cells plays a key role in smooth muscle cell phenotypic modulation in the development of atherosclerotic lesions. Drs. Blackman and Wamhoff will investigate the effects of cardioprotective and atherosclerotic prone hemodynamic flow patterns on endothelial cell-dependent alteration of smooth muscle cell phenotype. This collaboration is a marriage of two very distinct fields of study, endothelial cell (Blackman) and smooth muscle cell (Wamhoff) phenotypic modulation. In their application, Blackman and Wamhoff stressed "how for-

continued on page 4



Cooperative Research Program Signed with the University of Rome

In June a memorandum of understanding was signed between U.Va. and the University of Rome “Tor Vergata” for the exchange of information between faculty, publications, and exchange of research scholars and students. Areas of mutual interest specifically identified in the agreement are biomathematics, biotechnology, and economics. It is hoped that distance learning programs, conferences, courses and workshops will be jointly developed as a result of the agreement.

The University of Virginia’s Boris Kovatchev, a leading member of the U.Va. Center for Biomathematical Technology and professor of psychiatric medicine, headed the initiative to build the collaborative relationship with the Italian university. A course that he teaches together with Drs. Martin Straume and Michael Johnson,



Boris Kovatchev

BIMS 541, will likely be one of the first modules to be implemented in Rome in biomathematics.

Key Italian faculty members include Luigi Accardi, who is the director of the Centro Matematico Vito Volterra. Accardi is best known for his theory of quantum probability and is involved in various applications in physics, economics and biology. Professor Accardi is planning a visit to Charlottesville early next year to establish personal relationships with interested parties in the departments of mathematics and economics.

Also keenly involved in the collaboration is Vittorio Colizzi, an immunologist who works in the field of HIV/AIDS and is a close collaborator of Luc Montagnier (one of the discoverers of HIV). Dr. Colizzi is very active in the research and the public service sides of AIDS, particularly in Africa, and is engaged with the joint laboratories directed by Drs. Robert Gallo and Luc Montagnier in Baltimore and Rome. He holds the UNESCO Chair in Biotechnology in Rome.

For more information about this initiative, contact Boris Kovatchev at boris@virginia.edu ■

New Research Link with Botswana

Tiny Botswana, with a population of little more than 1.5 million, is beginning to show much larger African nations and developing countries elsewhere in the world how to successfully mount an AIDS prevention and treatment program. Now, in a collaborative project growing from U.Va.’s SAVANA consortium (for Southern Africa-Virginia Networks and Associations), faculty members from U.Va.’s School of Medicine are helping to build partnerships with health professionals in this southern African nation to tackle one of the many consequences of the AIDS epidemic: the orphans that the disease leaves behind. It is estimated that as many as 80,000 orphans in Botswana alone are affected by the loss of one or both of their parents. Despite the enormous scale of the tragedy in this nation where 40% of the population is believed to be

Tiny Botswana is beginning to show much larger developing countries how to successfully mount an AIDS prevention and treatment program.

HIV positive, President Festus Mogae recently announced at an international AIDS conference that the death rate has been dramatically cut due to anti-retroviral treatment, which is being administered to more than 50,000 patients.

Thomas Massaro, M.D., Ph.D., associate dean for graduate medical education in the School of Medicine, together with Keri Hall, M.D., interim hospital epidemiologist and infectious disease specialist, Eileen Ryan, D.O., child psychiatrist in the Department of Psychiatric Medicine, and Peter Patrick, Ph.D., pediatric psychologist at the Kluge Children’s Rehab Center, has received funding from Botswana’s Department of Social Services to develop a manual to help health professionals deal



l. to r.: Peter Patrick, Dr. Keri Hall, Eileen Ryan and Dr. Tom Massaro work to benefit Botswana orphans

Botswana *continued*

with the psychosocial needs of these orphans. They will partner with University of Botswana faculty members Barbara Ngwenya, Ph.D., Nthabiseng Phalaze, Ph.D. and Keitseope Nthomang, Ph.D., to address the physical and psychological catastrophe that has befallen these children. While many are cared for by extended family, the burden that this places on both family members and the larger community is enormous.

According to Massaro, U.Va. faculty hope to learn from being able to observe first-hand how effectively

“The opportunity to make a positive contribution may well prove to be a life-changing event for those who participate.”

health care can be delivered and financed in a developing country, as well as being able to contribute to the development of successful models for supporting orphans through adulthood and self-sufficiency. “I expect that this will offer opportunities for medical students and residents to visit Botswana as part of their elective training,” he says. “The opportunity to make a positive contribution may well prove to be a life-changing event for those who participate.” Meanwhile, the collaborative relationships, including exchange visits by Botswana health professionals to U.Va., and by students and faculty members to work at sites in Gaborone and at the University of Botswana’s Harry Oppenheimer Research Center in Maun in the north of the country will be mutually beneficial. ■

Guardians of a World Heritage Site

Brian Hogg worked for almost 20 years with the New York City Landmarks Commission. He knows about the problems of preserving important historical sites, especially those in daily use. Now he has joined the Office of the Architect for the University to strengthen the University’s efforts to conserve both the Academical Village, a World Heritage site, and the other significant historic structures built since Mr. Jefferson’s time.

Hogg was an art history major at U.Va. and earned his graduate degree in historic preservation from Columbia University. Since the University had received a major award from the Getty Foundation to develop a historic preservation master plan, Hogg was an ideal candidate to join the team as a senior preservation planner. Together with outside consultants and graduate students in the architectural history program of the School of Architecture, he is cataloging all the built environment of the University of Virginia from the post-Jeffersonian era to buildings constructed in the 1960s.

The objective of the effort is to determine a set of conservation priorities. More

than 130 buildings and 24 landscape areas will be included in the catalogue, together with the history of each site and a priority ranking. The database will help to determine the order in which conservation funds will be used to restore buildings and to enhance the landscape. Mary Hughes, the University’s landscape architect, and David Neuman, the architect for the University, serve on the advisory board that oversees the work, together with Richard Guy Wilson, professor of architectural history, William Beiswanger of the Thomas Jefferson Foundation, the organization that is the steward for Monticello, Lynn Beebe, the executive director of Poplar Forest, Jefferson’s country retreat in Bedford County, Virginia, and several other prominent Virginia historic preservationists.

“Best of all,” according to Hogg, “the project offers students of architectural history a hands-on opportunity to see how historic sites can be enhanced while maintaining their function.” To be able to use the project as a model for students, he notes, while helping to prepare them for a career in historic preservation is a satisfying process. ■

W.M. Keck Foundation Award *continued from page 1*

Tom Crowe in electrical and computer engineering, Michael DeVore in systems and information engineering, and Lukas Tamm, professor of molecular physiology and biological physics.

According to Lukas Tamm, the interaction of THz radiation with biological materials has been largely unexplored until now. Probing biological materials such as DNA and proteins with THz radiation is expected to disclose new information about weak interactions within and between biomolecules. For example, hydrogen bonds and non-bonded interactions are responsible for the folding of proteins, the struc-

ture of DNA, and the binding of substrates, inhibitors and drugs to enzymes. The goal of this grant is to understand

what signatures these weak bonds elicit in THz spectra and in turn to learn from experimental THz spectra new fundamental biology about DNA, proteins, receptors, small molecules and

the interactions between them.

U.Va. researchers already have demonstrated THz absorption within biological macromolecules such as DNA, RNA and certain proteins. THz spectroscopy also has been shown to be useful in characterizing biological materials in aqueous and gel forms and in solid films. ■

The goal of this grant is to understand what signatures these weak bonds elicit in THz spectra.

Agreement with China's Institute of Atmospheric Physics

Hank Shugart's name is synonymous with global ecological research. His work on simulation modeling of forested land in Russia over many years examines how land use and climate have become the basis for ecological monitoring in that country. He has undertaken similar studies in Sweden, Austria and Australia. He participates in the University's SAVANA project in southern Africa, and is now embarking on a new partnership with China's Academy of Sciences.

Shugart is the W.W. Corcoran Professor of Environmental Sciences, the author of *How the Earthquake Bird Got Its Name*, a study of "unbalanced nature" written for a general audience, and a director of the University's Center for Regional Environmental Sciences.

Two postdoctoral researchers who trained with Shugart at U.Va. have become leading figures in the Chinese Academy of Sciences. Cao Mingqui leads the calculation of China's carbon budget, and Yan Xiaodong directs studies on climate effects of changes in land use patterns. According



Yan Xiaodong with Hank Shugart at a weather station in northern China

to Shugart, the Chinese Academy will establish three research partnerships worldwide on this subject and U.Va. is the first institution with which the relationship has been formalized. He anticipates that this will lead to exchanges of graduate

and postdoctoral students on a larger scale, and to closer collaborations with faculty in China.

Shugart and Yan have developed models for the volcano Chiangbai Shan (literally, the "Perpetually White Mountain") in Jilin Province, close to the border between China and Korea, in the area formerly known as Manchuria. The Chinese/U.Va. collaboration will develop advanced computer models showing how the terrestrial surface interacts with the atmosphere. Shugart says that the concern over pollution and environmental degradation that the Chinese government is now expressing is a direct result of the alarming findings of scientists in the Chinese Academy, and their determination to find ways to remedy the problems that have been identified. Other research will focus on aridification projections for northern China, and improved capability to model the interactions of water, soil, air, flora and fauna, and human activities over the eastern Eurasian region. ■

FEST Turns Its Attention to Young Investigators

continued from page 1

fortunate they were to have this opportunity at U.Va. as the disparate nature of these two fields would not likely foster success under the auspices of one PI elsewhere." Klaus Ley, M.D., professor of biomedical engineering, was the mentor for this collaborative research.

Keith Williams (Physics, CLAS) received an award to accelerate his work on a nanoscale fabrication process for near-field photolithography. Physics professor Joseph Poon was his mentor. Williams says that this offers a lower cost and high-throughput alternative to electron beam lithography—the technology currently used for fabricating multilayer nanostructures. He proposes combining deep ultraviolet near-field exposure with the direct-write capability of scanning

probe microscopy. "Because this capability will offer a low-cost, flexible alternative to existing technologies, it is likely to generate an enthusiastic response from the nanotechnology community," states Williams.

Greg Okin (Environmental Sciences, CLAS) was selected for a FEST award to develop pilot data to support an NSF proposal for a new technique called LIDAR (light detection and ranging) to measure the flux of aerosols which include pollutants and dust in the earth's atmosphere. These aerosols can travel thousands of miles and influence the entire ecosystem. "Desert dust impacts global climate through its ability to scatter and absorb light and to affect cloud properties," says Okin. "It can play a major role in ocean fertilization and carbon dioxide uptake, influencing the concentration of greenhouse gases

in the atmosphere." Using the FEST award, he will use LIDAR to continuously scan the atmosphere hemispherically to obtain temporally and spatially continuous information about backscatter due to dust. He will use the information to predict future dust emissions based on changes to vegetation in the Jornada Basin in the desert of New Mexico. Eventually, Okin hopes to obtain NSF funding to study future climate change in any location using this technology. His mentor for this research was environmental sciences professor Hank Shugart.

The deadline for submission of an application for next year's awards is expected to be early 2006. For further information about the program, contact Jeffrey Plank, Associate Vice President for Research and Graduate Studies, jp4q@virginia.edu ■

Virginia Gateway - New Director Announced

The Vice President for Research and Graduate Studies has appointed Pace Lochte as director of Virginia Gateway for Technology and Economic Development. Virginia Gateway is



Pace Lochte, new director of Virginia Gateway

the portal for industry and community groups wanting to tap into the research activities of the University. Lochte is responsible for guiding both U.Va. inventors and industry partners through the process of bringing new ideas and important research to market.

“Gateway’s mission is to work with corporate and community partners to move technology from the research labs into the public realm,” says Lochte. “We have a number of units at U.Va. whose missions intersect with companies, including the Research Parks, Patent Foundation, Office of Sponsored Programs–Industry Contracting, Corporate and Foundation Relations, Spinner Technologies and the Batten Institute.” Acknowledging that corporate and community partners may find it daunting to make appropriate contacts

within the University, Lochte explains that her role is to help people find the right contact, understand the processes and figure out how to get things done.

Lochte foresees integrating technology commercialization efforts in the University with those efforts occurring in the broader community. “There is a tremendous amount of expertise in the community,” states Lochte. “We see the community as a valuable partner in helping to get the technology out into practice.” <http://www.virginia.edu/vprgs/industry/index.html>
Recent Gateway activities include:

- ◆ T100 Alumni Mentoring Program
- ◆ Nursing Ventures (a program of the U.Va. School of Nursing supporting entrepreneurship among nurses)
- ◆ Web-based outline of the Industry Contracting Process at www.virginia.edu/vprgs/industry/chart.html
- ◆ Piedmont Business Accelerator (a Web-based resource for entrepreneurs.)

Dr. Ariel Gomez, vice president for research and graduate studies, states: “Through Virginia Gateway, we are committed to providing service to faculty, increasing corporate-sponsored research and involving our alumni and students, at a fundamental level, in achieving the research objectives of the University.” ■

Virginia Tobacco Commission Funds New Nursing Career Program

The Virginia Tobacco Indemnification and Community Revitalization Commission has announced an award of \$248,828 to create a regional program in Southside and Southwest Virginia for advanced nursing education. The cooperative program, provided by the University of Virginia School of Nursing and Virginia Commonwealth University School of Nursing, will improve health care for the citizens of the region and provide a career ladder for registered nurses who can develop more specialized clinical skills, qualify as nurse managers and leaders and become nursing faculty. The program is especially significant given the twin challenges of an already severe national nursing shortage and the growing demand for more highly trained nurses. It will support the region’s existing healthcare industry and allow adult learners to continue in their current employment while taking courses. Stronger healthcare infrastructure plays a positive role in encouraging businesses, industry, and individuals to remain in and relocate to the region.

U.Va. anticipates that six students will enroll in the master’s program this fall with a target of ten students next year. The new Web-based program will make it possible for working nurses to complete their studies on a flexible schedule. This outreach complements the University’s vigorous nursing research program in rural healthcare, which includes a recently-launched Rural Health Care Research Center and a study of Shortages of Health Professionals in Rural Areas, both funded by the National Institutes of Health. Funds for the first year of the programs will be used to hire site coordinators in Southside and Southwest Virginia, cover faculty costs, distance learning technicians and equipment, travel for recruitment and instruction, and scholarships. ■

T100 Alumni Mentoring Program

The T100 Alumni Mentoring Program is a membership organization of alumni business experts committed to helping U.Va. meet its strategic science and technology goals through contributions of funds and hands-on mentoring for University-related startup companies. T100 has assisted nine companies, involved 50 alumni and raised \$130,000 for research programs and grants to T100 companies over the past two years.

Current T100 companies include: ContraVac (2005 Virginia Piedmont Technology Council Breakthrough Award Finalist), Directed Vapors Technology Inc (2005 VPTC Rocket Award Winner), Home Guardian, Virginia Diodes, Plurogen, and Global Cell Solutions.

New T100 Startup Company Announced Global Cell Solutions is the newest T100 company. A spinoff of Robin Felder’s Medical Automation Research Center, GCS is breaking through current cell-based screening technologies by developing innovative cell culture techniques for human therapy. ■

Morphogenesis Symposium Held in May

The Morphogenesis and Regenerative Medicine Institute (MRMI) sponsored its second international symposium May 23-25 at the University. The keynote speaker was Marc Kirschner (Harvard Medical School) who spoke on a systems biology approach to morphogenesis. He emphasized the importance of concepts from evolutionary biology to understand the systems that control the growth, development and regeneration of body parts and organ systems.

Other participants included Brant Weinstein (NIH) and Mark Krasnow (Stanford) who discussed the mechanisms by which cells assemble complex branching networks of tubular structures, such as the vasculature. Zena Werb (UCSF) and Brigid Hogan (Duke University) spoke in a session on organogenesis, in which they discussed the development and growth of the lung and the mammary gland and how growth control goes awry in cancer. Also present were Margaret Fuller (Stanford) and Donald Brown (Carnegie Institute) who reviewed their latest research on control of stem cell division and fate determination and on the widespread tissue remodeling occurring during metamorphosis, respectively. David Kingsley (Stanford) and Nipam Patel (UC-Berkeley) spoke in a session on the evolution of form, including the evolution of limb structures in fish and the generation of patterns in butterfly wings. Laura Kiessling (University of Wisconsin) and David

Mooney (Harvard) spoke about chemical biology approaches to morphogenesis, including screens for molecules that regulate stem cell growth and the use of biomaterials in tissue engineering. Cornelius Weijer (University of Dundee, Scotland) and Arthur Lander (UC-Irvine) discussed the role of computer modeling in morphogenesis, covering the role of chemotactic cell movements in tissue patterning, and the molecular logic underlying the establishment of morphogen gradients, respectively.

According to Barry Gumbiner, director of the Institute, these speakers represent the very best scientists in their fields. They spoke on subjects of intense interest to the



Andrew Shurleff

l. to r.: Ray Keller, Barry Gumbiner, and Doug Desimone

Institute, many of

which represent areas targeted as high priority for faculty recruitment as it grows. For the U.Va. community, these provide an outstanding opportunity to learn about leading research and ideas in morphogenesis and regenerative medicine. Students and fellows, as well as faculty, participate directly by presenting their own research in poster sessions.

The symposia draw the attention of the broader national and international research communities and

help to identify U.Va. as a key institution for research in morphogenesis and regenerative medicine. Numerous participants attended from institutions outside Charlottesville and Virginia, including several researchers from the National Institutes of Health. ■

"For the U.Va. community, these symposiums provide an outstanding opportunity to learn about leading

research and ideas in morphogenesis and regenerative medicine."

For Postdoctoral Researchers: What's New

The Office of the Vice President for Research and Graduate Studies is pleased to announce two new programs to enhance the postdoctoral experience at the University of Virginia.

The Postdoctoral Seminar Series is designed to provide the postdoc community with information and resources in addition to that provided by their own departments and PIs.

The program was developed after surveying the postdoc community for topics of interest. The seminar series, which began at the end of June, will be a lunchtime meeting with different speakers each month. The series will include a core curriculum of topics, which will be delivered over a two-year period. As the term of most postdoctoral positions is three years it is hoped that most postdocs will be able to attend and participate in the core curriculum over their term. The topics will include:

- ◆ how to develop a research project, from inspiration to perspiration
- ◆ how to choose and interact with your mentor, including negotiating shared responsibility
- ◆ laboratory safety including basic laboratory safety and chemical/radiological compliance
- ◆ responsible conduct of research, intellectual property, ethical issues in research
- ◆ responsibilities in human and animal research
- ◆ transitioning from postdoc to junior faculty: how to plan your next step in an academic career and how to obtain and negotiate an academic position
- ◆ grant writing 101
- ◆ collaborations: how to manage intra- and extra-lab relationships

- ◆ alternative careers to academic research
- ◆ how to build your CV and improve interviewing skills
- ◆ presenting your data: ways to improve posters, short talks, slide presentations
- ◆ preparing a scientific manuscript
- ◆ international issues that affect postdocs from overseas
- ◆ women in science
- ◆ time management: juggling competing priorities while maintaining sanity
- ◆ teaching skills 101: Teaching Resource Center
- ◆ creating diversity in culture and thought
- ◆ NIH grants, NSF grants: what these funding agencies are looking for.

Other topics of interest will be included throughout the two-year time period.

While research associates are employed by the University and have available the full benefits of research faculty, the second program is the procurement of improved benefits for non-employed postdoctoral fellows. For postdocs, whose funding does not come from the University but from NIH training grants or private funding, benefits have not been previously available because they are not employees of the University. The Office of the Vice President for Research and Graduate Studies is happy to announce that in addition to the Postdoctoral Health Insurance plan, it can now provide the enhanced benefits of life and disability insurance. This program was implemented as of June 1, and provides significantly enhanced benefits for the U.Va. postdoctoral community. ■

Occupational Health and Safety for Animal Researchers

The occupational health and safety program for animal researchers has been redesigned since the last AAALAC inspection two years ago. Deficiencies noted by the AAALAC site visitors were a driving force for much of this change, and a committee chaired by Linda Way-Smith, director of faculty and staff benefits, has worked to develop a comprehensive program that more thoroughly assesses risks and provides appropriate levels of preventive measures and care to minimize risks. At all times in the development of this program, consideration for researchers' needs has been essential. However, of paramount importance was the need to create a program that met all regulatory requirements and provided better overall medical care and safety for employees and students in contact with laboratory animals. The program is coordinated by Environmental Health and Safety, U.Va. WorkMed, Student Health, the Animal Care and Use Committee, and the Center for Comparative Medicine.

Enrollment in the program begins when a new person is added to an Animal Use Protocol. At that time, the individual is required to visit U.Va. WorkMed (or Student Health for students) and bring a completed Health History and Risk Assessment form. A nurse reviews the form and decides if any immunizations or tests or a physical exam are required or recommended. Respiratory protection may be recommended for individuals with a history of laboratory animal allergy, and annual rechecks are required. However, the committee is considering the possibility of replacing these with a questionnaire, so that rechecks might only be necessary for individuals who are at risk.

U.Va. WorkMed and Student Health also handle all workplace injuries and exposures. Rodent bites and needle stick

continued on page 10

Mobile Applications and Wireless Networking Symposium

The Virginia Piedmont Technology Council's (VPTC) second annual fall symposium will focus on Mobile Applications and Wireless Networking: Understanding and Evaluating the Technology. The event will take place on Thursday, October 6, at the Doubletree Hotel in Charlottesville. It is designed for large and small enterprises, educational institutions, healthcare organizations, and government agencies that are investigating, developing, and using mobile applications and wireless technology.

The program will feature six themed sessions and nine tutorial workshops focused on innovation and practical applications of wireless technology. Session topics will include an in-depth look at the mobile field force, voice-over-IP (VoIP) over WiFi, what wireless neighborhoods will look like in 2010, selecting the right device for your business, machine-to-machine (M2M), the future of mesh networking, and more.

Over three hundred attendees and more than two dozen exhibitors are expected to be present. Sponsors include the Center for Innovative Technology, Defywire, Nextel, Nortel,

NTELOS, and RIM. VPTC is building on the success of the first fall symposium, held in September 2004. "Last year we focused on understanding wireless technology and we looked at what was possible," said VPTC executive director Gail Milligan. "This year we're focusing on what's new and what's working. We want participants to see the everyday practical value—for their companies and for their own personal use—that innovative wireless applications can deliver." According to Bill Clark, program co-chair and vice president for business development at Syclo LLC., "The fall symposium will give technical and non-technical business people a better understanding of the technology and the tools and a better view of the future."

Registration is now open at <http://www.vptcfallsymposium.com/>. Prior to September 23, registration fees are \$145 for VPTC members and \$195 for non-members. VPTC is a membership organization for those with an interest in technology. Call (434) 817-6300 for more information or visit <http://www.vptc.org>. ■

2005 Inventors of the Year

Based on news reports by Marie Kerbeshian, Ph.D., and Charlotte Crystal

The University of Virginia Patent Foundation has bestowed its highest honor, the Edlich-Henderson Inventor of the Year Award, on two pediatricians who specialize in lung disease, Dr. John F. Hunt and Dr. Benjamin M. Gaston.

The research collaboration between Dr. Hunt, assistant professor of pediatrics, and Dr. Gaston, professor of pediatrics, on pediatric lung disease has led to the development of several inventions that can be used to diagnose and monitor asthma and other lung diseases in simple, accurate and noninvasive ways. More than 200 laboratories on six continents have used the technology they developed. It also is being used in major clinical trials funded by the National Institutes of Health, a study by the American Lung Association and long-term drug studies by the world's largest pharmaceutical companies.

Their work represents a significant advancement in the study of lung pathology.

Hunt and Gaston have found that the breath exhaled by diseased lungs is 100 to 1000 times more acidic than that exhaled by healthy

lungs. "This has led to an entirely new paradigm of lung disease," according to Dr. Peter Heymann, professor of pediatrics at U.Va., who nominated Hunt and Gaston for the award. Because airway



Drs. John Hunt and Benjamin Gaston

acidification underlies many of the symptoms of asthma, emphysema, and respiratory failure they have coined the term "airway acid stress" to describe this phenomenon, Heymann writes. He believes their work represents a significant advancement in the study of lung pathology.

In addition to their basic research into the processes of lung disease, the pair also has invented noninvasive equipment and systems to measure the levels of oxidant stresses in the lungs and the acidity of exhaled breath. The researchers also have established a start-up company, Respiratory Research Inc., to sell their technology to the research market while pursuing FDA approval for clinical use in the United States. The regulatory authority for the European Community has given approval for its clinical use throughout Europe. ■

Major Awards in May and June 2005

Laura M. Justice, Curry School of Education, \$2,626,657 from U.S. Department of Education for Reading Comprehension and Reading Scale-Up Research.

Laura M. Justice, Curry School, \$1,372,429 from U.S. Department of Education for Efficacy of Conversational Responsiveness Language Intervention-Field Initiated Studies.

Nancy Iverson, School of Continuing and Professional Studies (PCS), \$539,370 from Virginia Department of Education and U.S. Department of Education for Mathematics & Science Partnership.

Joel M. Linden, Cardiovascular Research Center in the School of Medicine (SOM), \$1,589,166 from the National Heart, Lung & Blood Institute, NIH, for research on the role of inflammation in pulmonary injury.

John C. Marshall, Center for Research in Reproduction, SOM, \$1,122,526 from the National Institute of Child Health & Human Development, NIH, for Clinical & Basic Studies in Polycystic Ovarian Syndrome.

Fabio Cominelli, Digestive Health Research Center and Internal Medicine, SOM, \$1,139,989 from the National Institute of Diabetes & Digestive & Kidney Diseases, NIH, for the Digestive Health Research Center.

Rachel Fowlkes, Southwest Virginia Higher Education Center, PCS, \$2,800,000 from the Virginia Tobacco Commission for Southside Virginia Tobacco Loan Forgiveness Program.

Rachel Fowlkes, PCS, \$1,000,000 from the Virginia Tobacco Commission for the Southwest Virginia Burley Tobacco Scholarship Program.

Elliott Haley, Neurology Department, SOM, \$1,218,808 from National Institute of Neurological Disorders and Stroke, NIH, for Phase 2B Study of TNK in Acute Stroke.

John Parsons, Microbiology Department, SOM, \$940,510 from the National Cancer Institute, NIH, for Signal Transduction in Time & Space.

Fred Wooten, Neurology Department, SOM, \$1,267,448 from the National Institute of Neurological Disorders and Stroke, NIH, for Mitochondrial Etiologies of Parkinson's Disease.

Larry Sabato, Center for Politics, Office of the Vice President for Research & Graduate Studies, \$1,388,800 from the U.S. Department of Education Youth Leadership Initiative.

Joseph Allen, Psychology Department, College of Arts & Sciences, \$544,823 from the National Institute of Mental Health, NIH, for Adolescent Peer Relations: Outcomes & Family Precursors.

Erik Hewlett, Infectious Diseases, SOM, \$986,502 from the National Institutes of Health for a Regional Center of Excellence for Biodefense & Emerging Infectious Diseases Research, in collaboration with the University of Maryland.

Sarah Parsons, Dept. of Microbiology, SOM, \$593,223 from the National Cancer Institute, NIH, for Cancer Research Training in Molecular Biology.

Michael Demetsky, Civil Engineering, School of Engineering and Applied Science (SEAS), \$571,200 from U.S. Dept. of Transportation for the Center for ITS Implementation, in collaboration with George Mason University.

Gene Block, Vice President and Provost, \$1,639,200 from Carnegie Corporation of New York for Teachers For A New Era.

William Petri, Infectious Diseases, Internal Medicine, SOM, \$721,758 from the National Institute of Allergy and Infectious Diseases, NIH, for Rapid Diagnostics for Category B Enteropathogens.

William Petri, Infectious Diseases, SOM, \$586,548 from the National Institute of Allergy and Infectious Diseases, NIH, for Infectious Diseases Training Program.

Thomas Skalak, Biomedical Engineering, SOM and SEAS, \$840,511 from the Whitaker Foundation for the Building Partnerships program.

Haydn Wadley, Materials Science, SEAS, \$600,000 from the Office of Naval Research for Accelerated Development of Vapor Phase Synthesis Tools for SPINS Devices.

injuries are among the most commonly reported injuries. Incident reports are maintained so that the committee can review over time whether the program is effective in reducing workplace injuries.

EHS and the Center for Comparative Medicine have worked together to engineer reduced exposure to animal allergens. A key component was to replace all horizontal laminar flow work stations in the animal rooms with vertical flow stations that drastically reduce exposure. This may eliminate the need for

animal care staff to wear respiratory protection in animal rooms.

Another element of the program relates to visitors who are exposed to laboratory animals during the course of their stay at U.Va. An information and waiver form is now available from the ACUC office (and will be available from the website in the near future). This form can be used by any visitor engaged in activities involving animals at U.Va., including visiting scientists, students and participants in Continuing Medical Education. ■

Cardiovascular Research Center Renamed

The Board of Visitors has approved the renaming of the Cardiovascular Research Center to the Robert M. Berne Cardiovascular Research Center, according to Dr. Klaus Ley, Director of the Center. This renaming honors the outstanding contributions Dr. Robert M. Berne has made to the field of cardiovascular research at the University of Virginia. ■

Small Business Innovation Research Funding Conference

Virginia's Center for Innovative Technology will host the 11th Annual SBIR Conference on October 19-20, at its offices in Herndon, VA. More information is available from Robert Brooke, associate program director for federal funding. Phone (703) 689-3080, or e-mail rbrooke@cit.org. ■

Research News

September 2005 Vol. 7 No. 3

Research News is published by the Office of the Vice President for Research and Graduate Studies.

Editor

Prudence Thorner

Contributors

Anne Bromley, Bobbe Nixon, Marie Kerbeshian, Deborah Van Eersel, and Dr. Patricia Foley

Photography

Andrew Shurtleff, Tom Cogill

Design

Richard Montoya Design

P.O. Box 400301
314 Madison Hall
Charlottesville, VA 22904-4301
(434) 924-3606

Web site:

www.virginia.edu/researchandpublicservice/researchnews.html



Office of the Vice President for
Research and Graduate Studies

UNIVERSITY OF VIRGINIA